

E-ISSN 2348-1269
ISSN 2349-5138



International Journal of Research and Analytical Reviews

UGC Approved

International Journal of Research and Analytical Reviews

Atman Publication Academy

2061-C/2/B, Nr. Adhyatma Vidya Mandir, Sanskar Mandal, Bhavnagar-364002.

Contact : 9427903033 E mail : editorsijrar@gmail.com

2018

E-ISSN 2348-1269
ISSN 2349-5138
Periodicity - Quarterly



International Journal of Research and Analytical Reviews

Integrated International Immersion Conference(IIC)

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Listed & Indexed in ISSN Directory, Paris
Peer Reviewed & Referred Multidisciplinary
International Journal

Cosmos Impact Factor 4.236

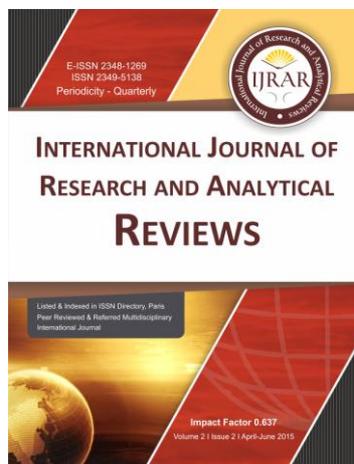
Impact Factor 3.215

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FOREWORD

I deem it a great pleasure to render my heartfelt gratitude to the members of the management, the organizing committee and my beloved students who showed keen interest to encourage the idea of the Integrated International immersion six days conference. It is the first conference of this kind in Loyola Academy Degree & PG College where in all the disciplines are involved with the union of mind and hearts to create a new moment in educating the other and to reach the unreachable.

The world is so competitive that a student has to shape his/her mind with an in depth knowledge of their own field and allied subjects. Apart from that the student also works to unravel his/ her mind to the other to share his/ her knowledge and to learn the mysteries that are hidden in the cradle of this mother earth.

Henceforth, the student community is focused and takes in-depth challenges to reach its aspired goals in collaboration with the others. The student considers the other as important as he/she is important to herself/ himself.

It is in this Scenario that I contemplated to draw the minds of all the disciplines to share on one platform the learning and findings of their inherent quest to reach their target.

I appreciate the overwhelming response of both the staff and students of Loyola Academy and Sainte Jeanne d' Arc College, Bringole to share their best practices and innovative ideas, concerning interdisciplinary ways to facilitate collaboration and generate opportunities for learning and research.

This is also a platform to club the national and international students together to share innovative ideas, dreams and aspirations to build a beautiful, harmonious world by recognizing the weak and strengthening them by generating new opportunities for their betterment.

In this conference, the students of Loyola from every discipline are organizing visual models to explain the idea of "See & Learn". Apart from this around 25 lectures are arranged by eminent scientists, professors industrialists who are very proficient in their subject. Research Scholars, industrial & corporate delegates, international students

and faculty members who have registered for this seminar are going to present around 50 papers and 100 posters. Around 90 full length papers are going to be published in the International Journal of Research & analytical reviews which has a 4 point impact factor and recognized by UGC. The conference also aims at giving an exposure to the international and national students as a sign of enlightening together, walking together and marching together in generating novel opportunities.

I express my sincere thanks to Fr. Selvinraj SJ who is instrumental in organizing the students of Sainte Jeanne d' Arc College and also who is a pioneer in conducting immersion programs and the staff and students of Loyola who stood by me in making this seminar a successful one.



Fr. Dr. L. Joji Reddy SJ
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Vice Principal,
Associate Professor- Biotechnology
President: Xavier board of Higher Education - A.P & T.S.
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Hyderabad



MESSAGE

I am happy that Loyola Academy Degree and PG College has organized an International Conference on "Igniting Novel Ideas to General Opportunities" from 23rd February to 1st March 2018

It is always a proud moment to Loyola Academy when such seminars and conferences are organized. I am sure the conference will provide a multidisciplinary platform for the delegates to deliberate upon the issues which are currently important to the public. Innovation is the theme of the present day world and cogitation of ideas at such gatherings will generate new opportunities. I compliment the faculty, staff, research scholars and students of the departments for their initiative in organising this international conference. I wish the conference all success.

With Regards

(Dr. C. LAXMA REDDY)

సిహెచ్. మల్లా రెడ్డి
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MESSAGE

I want to congratulate the organizers, faculty, and staff of Loyola Academy Degree and PG College for their excellent endeavour in organizing the 6 days Integrated International Immersion Conference on "Igniting the Novel Ideas to Generate Opportunities" from 23rd February to 1st March, 2018. Loyola Academy has always strived to bridge the gap between academic research and the common man. This conference will provide an exceptional platform for exchange of ideas between people from different backgrounds, locales and even nations. What is unique about this conference is its attempt to engage with several disciplines, making it a multidisciplinary avenue of innovative intellectual exchange.

I wish the conference a grand success. Let this conference be an eye opener for further research and motivate the participants to discover new ways of thinking across disciplines.

C. H. Malla Reddy
(CH. MALLA REDDY)

(CH. MALLA REDDY)

Place: Secunderabad - 500 011

Date : 25th January 2018



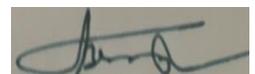
MESSAGE

I am happy to know that all our departments together are organizing Integrated International Immersion Conference (IIIC). Interdisciplinary exchange is the new trend in this rapidly evolving field of academia. I hope that by breaking down traditional disciplinary barriers, interdisciplinary interaction and research will provide scholars and students an immensely fertile platform for the exchange of ideas. This interdisciplinary component offers flexibility in doing research for independently motivated scholars who have cross-disciplinary interests.

I hope that main aim of this conference is to take stock of the new developments in various disciplines and to provide an opportunity to look forward to novel ideas. The conference also helps the scholars in developing a wider perspective of concepts which across disciplinary boundaries.

This conference should be intended to stimulate thought and, in particular, to provide activity at number of levels. This forum should offer some solutions for questions being raised in the conference. However, it is hoped that this conference should sensitize all those who are working in various fields, seek sustainable solution, and provide ways to develop the society.

I would like appreciate the organizing committee headed by Fr. Dr. L. Joji Reddy, S.J for planning to conduct International Conference (IIIC).



Rev. Fr. Anthony Pothi Reddy SJ

Principal

Loyola Academy Degree & UG College

Alwal, Secunderabad 500010 TS, INDIA



MESSAGE

I am deeply delighted to learn that the Loyola Academy Degree and PG College is organizing an International Conference on "**The Integrated International Immersion Conference**" (IIIC) in collaboration with **Sainte d' Are, Bringoles, France**.

The theme of this international conference, accommodating the best practices, innovative ideas, topical issues, concerning interdisciplinary approaches to facilitate collaboration and generate opportunities for learning, academic growth, research and employment is greatly informative and practical from the point of the students and the scholars.

I am sure the galaxy of eminent scientist, professionals and research scholars who would be unravelling their expertise with their gamete of latest information will be of very great source of knowledge to the participants in their field, to their practical applications in their lives and to the lives of the people at large.

Indeed, I take this golden opportunity to congratulate and to appreciate and to place on record my sincere and whole hearted appreciation to the college and to everyone who is involved in organising international conference.

I wish the conference a grand success!

Rev. Fr. S. Raju SJ

Fr. S. Raju SJ

Loyola Academy Degree & PG College
Alwal, Secunderabad 500010 TS.



Prof. S. RAMACHANDRAM
Vice-Chancellor

OSMANIA UNIVERSITY
(University with Potential for Excellence)
Hyderabad - 500 007, Telangana.

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MESSAGE

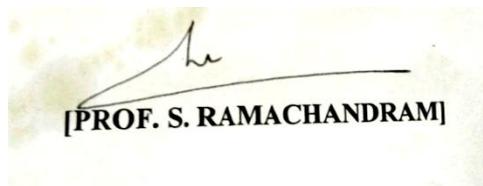
I am happy to learn that Loyola Academy Degree and PG College, Secunderabad is organising Integrated International Immersion Conference (IIIC) on Igniting Ideas to Generate Opportunities (INIGO)" during February 23-26,2018 and is also bringing out Souvenir to mark the special occasion.

I compliment and convey my best wishes to the Management, Principal, Staff and Students of the college on this auspicious occasion. I commend such confluence of faculty and inter-disciplinary activities aimed at promoting scholarship and advancement of knowledge.

The topic chosen for the International Conference is of topical significance and contemporary relevance. The International Conference focuses on multi-disciplinary perspectives and cutting edge researches in the faculties of Commerce and Management, Science and Technology, Social Sciences, Humanities and Arts.

I am sure this International Conference would provide a forum for meaningful deliberations on various issues pertaining to the theme and come out with useful insights.

I wish the International Conference all success.



[PROF. S. RAMACHANDRAM]



On the **16 January 2018**, I accompanied by Fr. Selvin along with Brigitte to Loyola Academy a Jesuit College in Secunderabad. We had the chance to meet Fr. Dr L. Joji S.J. the Vice-Principal, at Loyola Academy Secunderabad. Sharing his knowledge and skills in the field of Bio-Technology has been a great pleasure. We also visited the research laboratories. It was very interesting to learn what tools they used and what their skincare techniques are. He explained to us their recourse to Ayurvedic methods and meditation in addition to more traditional treatments (chemotherapy, radiotherapy, surgery).

As a psychologist, I had the opportunity to talk with a psychology teacher, thanks to the kindness of Fr. Joji S.J. It was an honour to learn about their reference, what are their fields of application. We also discussed the similarities between Indian and French culture regarding our life and practices.

In general, the studies proposed at Loyola College are varied and complementary. The richness of the program reminds me of the richness of the Indian culture and its people. I congratulate them for this program that allows access to different areas. I think it's a chance for students to study at this institution. I strongly encourage foreign students to study there to allow intercultural exchange. About me, it would be an honour for me to come to Loyola College to enrich my knowledge of psychology with this intercultural dimension. I really think that the future of humanity is the intercultural mix.

At this juncture I do wish all the best for the International Seminar organised by Fr. Joji and Fr. Selvin at Loyola Academy that commences on 23rd February 2018. I hope the French students from the Institute Sainte Jenne D' Arc Brignole France will have wonderful time with the Indian students and profit much by their interaction during this Seminar.

To conclude, I warmly thank all those who received us at the Loyola Academy. I express my gratitude for their hospitality, their warm welcome and their kindness.

Aurore Brisson

Psychologist in France
aurorebrisson@hotmail.fr



After visiting Loyola Academy Degree and PG College this past month, I am pleased to share my own congratulations to this institution for looking beyond the educational challenges of transmitting important information to the greater challenge of awakening minds and hearts to the process of transformation that is both multidisciplinary and multinational. During this first visit to India I could see clearly the Ignatian vision of education as a preparation to share in an active and compassionate way, in the process of global transformation. A great example for our Jesuit institutions in the USA and across the world.

C. Viscardi

Fr. Dr. Christopher J. Viscardi, SJ
Chair of Philosophy and Theology
Spring Hill College, Mobile (AL), USA



Today I keep very impressed by the guided visit we have had by Fr Dr. L. Joji S.J. of Loyola Academy College in Hyderabad. What a massive college campus with so many students and courses offered. After 17 trips in India (for two weeks to two months and a half), I go on to discover the great "ability" of their vocation linked to their open mindedness about all human dimensions ! I would be so happy to offer such example to my grand children and particularly to Theo, who would like to come in India! I cannot forget the happiness of the poor children in the Father Ceyrac canthers in Tamil Nadu and I try to go on and learn the different cultures, the different ideas about the life, about the other religions. In same way the visit we have to follow with Father Joji SJ explained us the different possibilities to discover humanity and we never finish! May be one Day meet more Indian Jesuits in France!

Kudos to the Loyola Academy for organizing the Integrated International Immersion Conference on “Igniting Novel Ideas to General Opportunities” from 23rd February onwards. My felicitation to the organizers and warm wishes for the success of the conference.

Brigitte PITTIOT (Educational Adviser, France)



UNIVERSITY OF SOUTH ALABAMA



Date: January 26, 2018

I want to congratulate the organizers, faculty, and staff of Loyola Academy Degree and PG College for their excellent endeavour in organizing the 3 day Integrated International Immersion Conference on "Igniting Novel Ideas to General Opportunities" from 23rd February to 1st March, 2018. Loyola Academy has always strived to bridge the gap between academic research and the common man. This conference will provide an exceptional platform for exchange of ideas between people from different backgrounds, locales and even nations. What is unique about this conference is its attempt to engage with several disciplines, making it a multidisciplinary avenue of innovative intellectual exchange.

I wish the conference a grand success. Let this conference be an eye opener for further research and motivate the participants to discover new ways of thinking across disciplines.

Sincerely,

A handwritten signature in blue ink that reads "Komaraiah Palle".

Komaraiah Palle, Ph.D. (Kumar)
Assistant Professor of Oncologic Sciences
Assistant Professor of Pharmacology
Abraham Mitchell Cancer Research Scholar
Mitchell Cancer Institute
University of South Alabama
Email: kpalle@health.southalabama.edu
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Great thoughts speak only to the thoughtful mind, but great actions speak to all mankind.

~ Theodore Roosevelt

Failure is the opportunity to begin again, more intelligently.

~ Henry Ford

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INTEGRATED INTERNATIONAL IMMERSION CONFERENCE 2017-18 "IGNITING NOVEL IDEAS TO GENERATE OPPORTUNITIES"

SCHEDULE

INAUGURATION	
10:00 am – 10:04 am	Prayer Song
10:04 am – 10:12 am	Welcome Dance
10:12 am – 10:16 am	State Cultural Dance
10:16 am – 10:20 am	Short Film about the College
10:20 am – 10:25 am	Welcoming the Dignitaries to the Dais & Lightening the Lamp
10:25 am – 10:40 am	1. Welcome Address by Patrons 2. Address by President 3. Conveners Message
10:40 am – 10:42am	Chief Guest Portfolio
10:42 am – 10:50 am	Chief Guest Message
10:50 am – 10:55 am	Felicitation to the Chief Guest
10:55 am - 11:10 am	Speeches by Guests of Honour 1. Richard Martin, ACCA, UK 2. Sajith Khan, Middle East
11: 10 am - 11:12 am	Guests Requested to be Seated among the Audience
11:12 am – 11:15am	Folk Dance
11:15 am – 11:30 am	Speeches by Guests of Honour continued
11:30 am – 11:50 am	Tea Break

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SCHEDULE

DAY1 23-02-2018 FRIDAY	
10:00 am – 11:30 am	Inauguration
11:30 am – 11:45 am	Tea Break
11:45 am – 12:45 pm	Plenary Session(Key Note Address)
12:45 pm – 01:30 pm	Lunch
01:30 pm – 03:45 pm	<p>Inauguration of Posters and Exhibits Session,Excursion</p> <p><u>SCIENCES:</u> Poster: Dr. Venugopal Reddy Retd. Prof.OU Exhibit: Dr. I.V Subba Reddy Associate Prof, Gitam, Hyd</p> <p><u>COMMERCE:</u> Poster: Prof Patrick Anthony, Dept. of Commerce, UCCBM, O.U Exhibit: Prof Patrick Anthony, Dept. of Commerce, UCCBM, O.U (Judge for the Posters & Exhibits)</p> <p><u>ARTS & HUMANITIES:</u> Poster:Dr.Uma Joseph Exhibit:Dr.Uma Joseph</p>
03:45 pm	Tea Break

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DAY224-02-2018SATURDAY	
09:45 am – 10:15 am	Inauguration
10:15 am– 10:35 am	Break
10:40 am– 11:30 am	SESSION – 1(SCIENCE) Dr. S.Ravi Kiran Prof. Head, Dean of Sciences
11:30 am– 12:20 pm	SESSION – 2(COMMERCE) Prof Sudhakar, Dean of Commerce, UCCBM, O.U
12:20 pm – 01:10 pm	Session – 3(ARTS & HUMANITIES) Mr. Vishweshwar, Retd.Professor,OU
01:10 pm –01:45 pm	Lunch
01:45 pm – 03:15 pm	PRESENTATIONS <u>SCIENCE – INIGO HALL</u> 1) Dr. I.V. Subbareddy Associate Prof,Gitam,Hyderabad 2) Dr. S.Ravi Kiran Prof. Head, Dean of Sciences <u>COMMERCE – LOYOLA HALL</u> Mr. Pramod Chandrasekhar Vice-President,HSBC <u>ARTS & HUMANITIES – IG 214</u> Mr. Vishweshwar Retd. Professor, OU
03:15 pm – 03:30 pm	Break
03:30 pm – 04:15 pm	Valedictory Ceremony

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INTEGRATED INTERNATIONAL IMMERSION CONFERENCE 2017-18 "IGNITING NOVEL IDEAS TO GENERATE OPPORTUNITIES"

DAY 3 26-02-2018 MONDAY	
SCIENCES	
01:00 pm – 02:00 pm	KEYNOTE ADDRESS Mr. Satish Yelanki MD, SkyESS, HYD
02:00 pm – 03:30 pm	PRESENTATIONS Mr. Satish Yelanki MD, SkyESS, HYD
DAY 4 27-02-2018 TUESDAY	
COMMERCE	
01:00 pm – 02:00 pm	KEYNOTE ADDRESS Prof Krishna Kumar, Dept. of Commerce, UCCBM, OU
02:00 pm – 03:30 pm	PRESENTATIONS Dr. John Moses, Principal cum Academic Director Dr. Narayana College of Commerce
DAY 5 28-02-2018 WEDNESDAY	
ARTS & HUMANITIES	
01:00 pm – 02:00 pm	KEYNOTE ADDRESS <ul style="list-style-type: none">Dr. Uma Joseph Dean of Academics St. Francis College for Women, Begumpet, Hyd
02:00 pm – 03:30 pm	PRESENTATIONS Dr. Uma Joseph Dean of Academics St. Francis College for Women, Begumpet, Hyd
DAY 6 01-03-2018 THURSDAY	
01:45 pm – 03:45 pm	VALEDICTORY

DISCOVERY OF SHMT OF *Plasmodium falciparum* AS NEW DRUG TARGET FOR MALARIA BY COMPUTER AIDED DRUG DESIGN STUDY

L Joji Reddy SJ¹, P Suresh Kumar¹, Kalidindi Sanjana¹, P Deepika¹, S Roja¹,
Vemula Sai Jahnvi¹ and Rajasekhar chikati²

¹Department of Biotechnology, Loyola Academy degree and PG College, Secunderabad, TS, India

²Department Biochemistry, Osmania University, Hyderabad, TS, India

Abstract-Malaria has been a massive killer in the recent times around the world with an increasing epidemiology each consecutive year. *P.falciparum* is the most fatal parasite causing death on infection. A new drug target shmt has been identified which is participates in denovo synthesis and can be a good inhibitory site. Instead of regular synthetic medicines, some natural compounds which can be antimalarial drugs were identified and docking studies were carried out to study the target-drug interaction and effective conformations for the following.

Keywords- Malaria, *P.falciparum*, Natural compounds, docking.

Introduction-

Malaria is one of the deadliest diseases around the globe. It is caused by the protozoan infection of the genus *Plasmodium*. *Plasmodium* genus has five subclasses i.e., *Plasmodium falciparum*, *Plasmodium vivex*, *Plasmodium ovale*, *Plasmodium malariae*, *Plasmodium knowlesi*. *Plasmodium falciparum* and *P.knowlesi* infects primates and causes human malaria and may typically lead to the cerebral malaria. *Plasmodium falciparum* is one of the protozoan parasite that is transmitted by the female anopheles mosquito which causes malignant or pernicious malaria and shows a highest complication and mortality rates.

Serine hydroxyl methyl transferase (SHMT) is used as new drug target for malaria. SHMT is a pyridoxal phosphate dependent (PLP) enzyme which plays a vital role in the de novo pyrimidine biosynthesis pathway in malarial parasites. It plays an important role in the cellular one carbon pathways by reversible catlyzation i.e.-serine to glycine and THF (tetrahydrofolate) to 5, 10 methylene THF (O3). The gene encoding for SHMT is found as cSHMT (cytosolic SHMT) and mSHMT (putative mitochondria SHMT) in the *plasmodium spp.* but the function is still unknown. SHMT is a monomer which is present in both prokaryotes and eukaryotes in active forms i.e., dimer and tetramer forms. It has 3 domains i.e., N-terminus, large domain and small domain. The N-terminus maintains the tight interactions of the monomers; the large domain is for PLP binding site and tetramer stability.

Molecular docking is done to find the better orientations of the ligand interactions and overall minimal energies. Molecular docking studies are also used to determine the interactions between two molecules. Ligands are the small molecules that bind to the protein of interest to activate the active sites of the molecule. Docking score, calculation of interaction energy and 3D visualization of molecule are some components of molecular docking. Different visualization tools are employed to get the 3D Structure of molecule such as Pymol, rasmol, discovery studio etc. which help to predict the mode of ligand protein interactions and protein annotations. Major application of docking studies is drug designing and discovery.

A molecular docking study includes Dock Ligands (Ligand Fit), Dock ligands (CDocker) and Dock Ligands (LibDock).

Ligand fit - ligand conformations generated using Monte-Carlo techniques are initially docked into an active site based on shape, followed by further CHARMM minimization.

CDocker- random ligand conformations are generated using CHARMM based molecular dynamics. The positions of the ligands are optimized in the binding site using rigid body rotations followed by simulated annealing.

LibDock- a high-throughput docking algorithm that positions Catalyst generated ligand conformations in the protein active site based on polar and a polar interaction sites (hotspots).

The drugs that are designed to cure or prevent malaria known as antimalarial drugs. Some compounds like chloroquine and hydroxychloroquine are commercial drugs used to treat malaria. These compound bind specifically to the active sites of the protein and inhibit its activity.

Materials and Methodology-

Structural Refinement:

The structure of *pf*SHMT confirmed by x-ray crystallography is available in the protein data bank (PDB). Hence, it was retrieved from RCSB-PDB (01). Sometimes few short contacts are lost or the structure changes its geometry due to crystallographic studies. Thus energy minimization was performed to revive a stable structure with good geometry.

Structural Validation of the *pf*SHMT 4O6Z:

A validated structure of SHMT in *Plasmodium falciparum* was available in PDB. This structure was used to perform docking studies (01).

Docking Studies:

After downloading the crystal structure of SHMT in *Plasmodium falciparum* (PDB ID: 4O6Z) from RCSB PDB, two active sites were found among which AS1 was chosen. The main objective was to check the binding efficiency of the natural compound- fosmidomycin with active site. Autodock 4.2 was used for the docking study of crystal structure of *Plasmodium falciparum* SHMT combined exploits the Lamarckian genetic algorithm.

We can visualize the most favorable clusters online and download them on computer. The grids (one for each atom type in the ligand plus one for electrostatic interactions) were chosen to be sufficiently large to include not only active site but also significant portions of the surrounding surface. The docking grid size was prepared with the autogrid utility of Autodock setting to 60X60X60 points with a grid spacing of 0.375 Å. After docking the ligand-receptor complexes were analyzed by Pymol program. The grid center was placed in the active site pocket center. The grid boxes included the entire binding site of the enzyme and provided enough space for the ligand translational and rotational walk. The consistencies of the maps were ascertained by checking the minimum and maximum values of the vanderwaal energies and electrostatic potentials for each calculated grid map. Docking was carried out using the empirical free energy function and the Lamarckian genetic algorithm, applying a standard protocol, the energy evaluations were 250,000, the maximum number of iterations 27,000 for an initial population of 150 randomly placed individuals. The number of docking runs was 100 and, after docking, the 100 solutions were clustered into groups with the RMS deviations lower than 0.5 Å. The clusters were ranked by the lowest-energy representative of each binding mode. The study was performed on an AMD 64 bits dual processor with Linux operating system. Protein structure checks were conducted using the ADIT validation server (<http://deposit.pdb.org/validate/>).

Results and Discussion:

SHMT belongs to the class of transferases which involves in denovo synthesis of carbon pathways. Because of its involvement in the metabolic pathway of *plasmodium falciparum*, it proves as a novel drug target. A solved protein structure for human *pf*SHMT is available at the protein data bank (PDB). Therefore, we had taken it from RCSB PDB, the 3D structure of *pf*SHMT generated by using discovery studio is shown in **Fig.1a**, was docked with Fosmidomycin (natural compound) shown in **fig.1b**.

Molecular Docking:

The computer simulated automated docking studies were performed using the widely distributed molecular docking software, Autodock 4.2. Energy minimized *pf*SHMT was docked with Fosmidomycin; it was developed from Dundee PRODRG2 server. The Fosmidomycin specifically bind at active site amino acids of active amino acids threonine-39, asparagine-40 and Ala 442, giving different docked energies Autodock binding affinities of fosmidomycin, showing binding affinity evaluated by the binding free energies (GB, kcal/mol), inhibition constants (Ki), hydrogen bonds and RMSD values.

Conclusion

Apart from the available synthetic drugs for the treatment of malaria, Fosmidomycin a natural compound proves effective in binding to SHMT drug target. Thus new alternatives can be developed which can possibly reduce the mortality rates of malarial patients especially when infected with the deadly parasite *Plasmodium falciparum*. In this work the 3D structure *pf*SHMT was taken from PDB RCSB. The structural orientations of the Fosmidomycin clearly indicates distinctive affinities of *pf*SHMT, this distinctive feature may be of help for inhibition of *pf*SHMT.

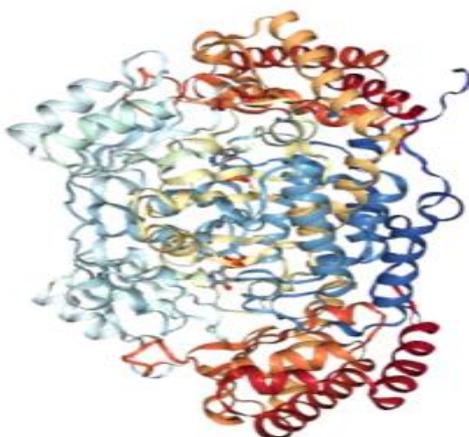


Fig.1a- 3D structure of *pf*SHMT

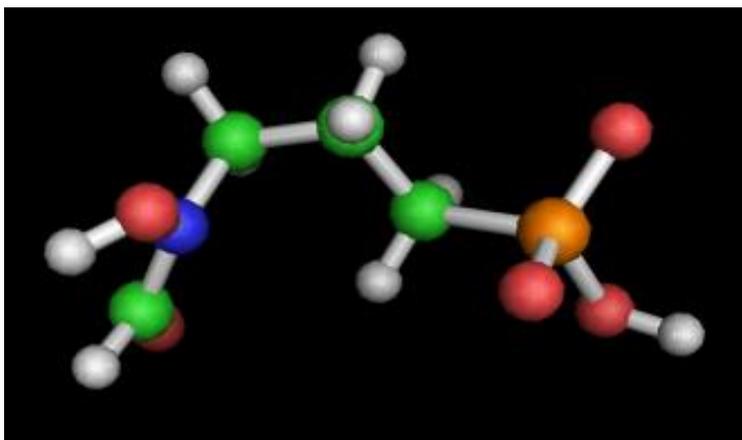


Fig.1b structure of Fosmidomycin

Cluster	Element	FullFitness (kcal/mol)	Estimated ΔG (kcal/mol)
0	0	-2749.96	-7.68
1	1	-2748.22	-7.55
2	2	-2746.54	-7.65
3	3	-2744.26	-7.00
4	4	-2743.92	-7.10
5	5	-2742.79	-7.23
6	6	-2742.04	-6.67
7	7	-2738.94	-7.02
8	8	-2738.67	-6.73
9	9	-2738.61	-6.31
10	10	-2738.00	-5.78

Table: docking results of *pfSHMT* with Fosmidomycin

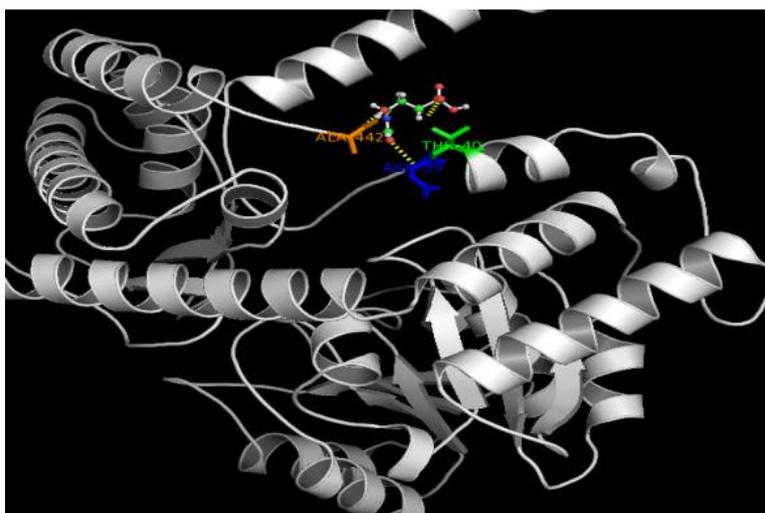


Fig.1d: Active catalytic amino acids represented in different colours and Fosmidomycin as ball and socket model.

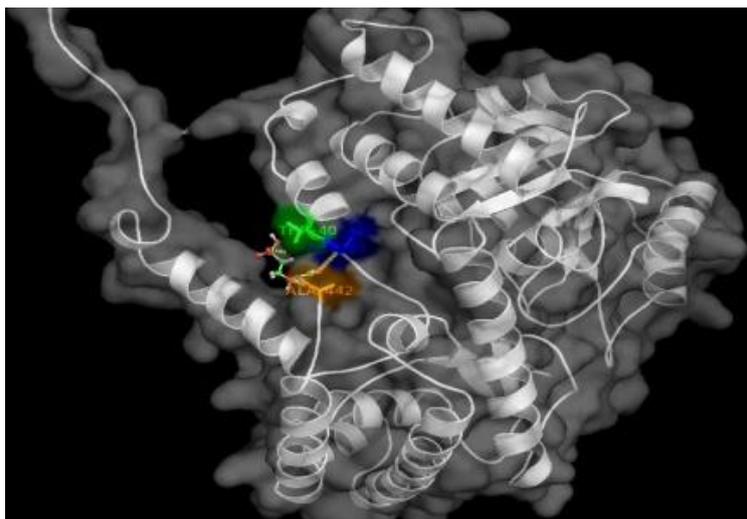


Fig.1d Docking region highlighted with rainbow colours. 3D structure of SHMT shown on surface and white ribbon. Visualized by Pymol.

References-

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DOCKING STUDY OF RHOC WITH EGCG OF GREEN TEA: AN INSILICO APPROACH

L Joji Reddy SJ¹, P Suresh Kumar¹, Kalidindi Sanjana¹, P Deepika¹, S Roja¹,
Vemula Sai Jahnvi¹ and Rajasekhar chikati²

¹Department of Biotechnology, Loyola Academy degree and PG College, Secunderabad, TS, India

²Department Biochemistry, Osmania University, Hyderabad, TS, India

Abstract: The aim of the present research was to study the anticancer effects of EGCG of green tea on human Rho-C. A solved protein structure for human Rho-C is available at the protein data bank (PDB). Therefore, we had taken it from RCSB PDB. Keeping the aim to determine molecular level interactions (molecular simulations and protein docking) of human Rho-C with EGCG of Green tea. We extended our work *in vitro* to *in silico* studies. To gain better relaxation and accurate arrangement of atoms, refinement was done on the human Rho-C by energy minimization (EM). The human Rho-C showed that known key residues playing important role in active site for ligand binding. The information thus discussed provides insight to the molecular understanding of human Rho-C together with enzymatic docking studies, to reveal key differences that could be useful for development of new anti-cancer drugs. These *in vitro* and *in silico* structural studies prove the effective inhibition of Rho-C of homo sapiens activity by EGCG of green tea in neoplastic cells and thereby provide new insights for the development of novel anti-cancer drugs.

Keywords: Rho-C, Homo sapiens, EGCG, Green tea, Molecular Dynamics, Docking, Anticancer

Materials and Methodology:

Structural Refinement:

Energy minimization of the human Rho-C is necessary in order to relieve short contacts and correct bad geometry. A solved protein structure for human Rho-C is available at the protein data bank (PDB). Therefore, we had taken it from RCSB PDB (01). The best initial model obtained from the template structure human Rho-C was solvated with solvent water molecule and was roughly energy-minimized.

Structural Validation of the Rho-C 2GCN:

Stereochemical quality and structure analysis (backbone and dihedral angle values) for the crystal structure of 2GCN was done with the PROCHECK (02), ERRAT (03), ProSA-Web (04), and VADAR (05) programs respectively. The Rho-C 2GCN PDB was taken directly from the RCSB PDB.

Docking with EGCG:

After the download of the crystal structure of Human Rho-C (PDB ID: 2GCN) from RCSB PDB, the next step was to build the corresponding Human Rho-C by docking epigallocatechin gallate (EGCG) into the respective active sites. The atomic partial charge of epigallocatechin gallate (EGCG) was added by online PRODRG server (06). Autodock 4.2 (07) was used for the docking study of crystal structure of Human Rho-C combined exploits the Lamarckian genetic algorithm (08). The grids (one for each atom type in the ligand plus one for electrostatic interactions) were chosen to be sufficiently large to include not only active site but also significant portions of the surrounding surface. The docking grid size was prepared with the autogrid utility of Autodock setting to 60X60X60 points with a grid spacing of 0.375 Å⁰. After docking the ligand-receptor complexes were analyzed by Pymol program (09). The grid center was placed in the active site pocket center. The grid boxes included the entire binding site of the enzyme and provided enough space for the ligand translational and rotational walk. The consistencies of the maps were ascertained by checking the minimum and maximum values of the vanderwaal energies and electrostatic potentials for each calculated grid map. Docking was carried out using the empirical free energy function and the Lamarckian genetic algorithm, applying a standard protocol, the energy evaluations were 250,000, the maximum number of iterations 27,000 for an initial population of 150 randomly placed individuals. The number of docking runs was 100 and, after docking, the 100 solutions were clustered into groups with the RMS deviations lower than 0.5 Å⁰. The clusters were ranked by the lowest-energy representative of each binding mode. The study was performed on an AMD 64 bits dual processor with Linux operating system. Protein structure checks were conducted using the ADIT validation server (<http://deposit.pdb.org/validate/>); WHAT IF web interface (<http://swift.cmbi.ru.nl>) and ProSA-web (<https://prosa.services.ca-me.sbg.ac.at>). Figures were developed using Pymol (<http://pymol.sourceforge.net/>).

Result and Discussion:

RhoC is a member of the Rho family of Ras-related (small) GTPases and shares significant sequence similarity with the founding member of the family, RhoA. However, despite their similarity, RhoA and RhoC exhibit different binding preferences for effector proteins and give rise to distinct cellular outcomes, with RhoC being directly implicated in the invasiveness of cancer cells and the development of metastasis. A solved protein structure for human Rho-C is available at the protein data bank (PDB). Therefore, we had taken it from RCSB PDB, the 3D structure of Rho-C generated by using Pymol software is shown in Fig.1a, EGCG compound taken from green tea, epigallocatechin gallate (EGCG) pdb was developed from Dundee PRODRG2 server, the 3D structure of compound EGCG shown in fig.1b, it was docked with Rho-C of homo sapiens (fig.1 c) it reveals that the residues involved in binding of various feedback inhibitors in template

Isoleucine-10, Valine-11, Glycine-12, Proline-36, Threonine-60, Phenyl alanine-84, Isoleucine-95, Leucine-114, Glycine-144, Methionine-147 and Alanine-148 shown in fig.1d.

Validation of the model:

In general, the evaluation parameters of the crystallographic structure of 2GCN obtained from RCSB PDB by WHATIF PROCHECK and ProSA-Web are within the interval of values derived for their homologs and for highly refined structures. RMSD Z-score values for bonds and angle parameters for the 2GCN are within values typical of highly refined structures. The fact that the RMS Z-score values of bonding distances and angles for the crystal structures are small might indicate that too-strong constraints for 2GCN. From the analysis of backbone conformations, the 2GCN interface presents only two residues located in a generous region and the remaining interface residues are in the favorable region of the Ramachandran Plot shown in Figure 2a (10). One indication that our 2GCN is a well-refined structure is the fact that its evaluation criterion of stereo chemical and structural parameters is better. The low overall RMS values for backbone superposition reflect the high structural conservation of this complex through evolution, making it a good system for molecular dynamics and docking studies as a drug target for cancer. From ProSA-Web analysis of a 2GCN protein structure shows the energy graphs having negative values correspond to stable parts of the structure. The ProSA web analysis of 2GCN showed the energy graphs within limits of results. The output graphs showed the Z scores, -9.69 for 2GCN, from this data we can consider the structure of the 2GCN interface as a good representation of the actual system. The detailed secondary structural investigation of the human Rho-C with PDB sum, a secondary structure prediction server revealed 40 (22.6%) residues were in strands, 61 (34.5%) residues were in α -helices, 06 (3.4%) residues that were in 3-10 helix and 70 (39.5%) residues were in other conformations (Fig. 2b). In the current case, the ERRAT score for the human Rho-C well within the range of a high quality model that is 91.124 (fig.2c).

Molecular Docking:

The computer simulated automated docking studies were performed using the widely distributed molecular docking software, Autodock 4.2 (07). Energy minimized human Rho-C were docked with epigallocatechin gallate (EGCG) it was developed from Dundee PRODRG2 server (06). The epigallocatechin gallate (EGCG) specifically bind at active site amino acids of Isoleucine-10, Valine-11, Glycine-12, Proline-36, Threonine-60, Phenyl alanine-84, Isoleucine-95, Leucine-114, Glycine-144, Methionine-147 and Alanine-148, give different docked energies. AutoDock binding affinities of the epigallocatechin gallate (EGCG), showing binding affinity evaluated by the binding free energies (Gb, kcal/mol), inhibition constants (Ki), hydrogen bonds, and RMSD values. The obtained success rates of Autodock is highly excellent shown in (Table. 1), where the docked EGCG binding free energies -28.43 kcal/mol (fig.3) From the results it will reveal that EGCG give lowest docked energy, this analysis reveal that the EGCG able to bind tightly with human Rho-C then the epigallocatechin gallate (EGCG) and showing greater binding energies. Fig.4 Active groove of human Rho-C with epigallocatechin gallate (EGCG) involve in binding of active site amino acids and the binding pocket shown in transparent solid surface with labeled amino acids (Pink) and the ligand EGCG shown as a ball & stick mode

Conclusion

In spite of the availability of effective chemotherapy towards cancer, still it remains a leading infectious killer world-wide. Many factors such as, human immunodeficiency virus (HIV) co-infection, drug resistance, lack of patient compliance with chemotherapy, delay in diagnosis, variable efficacy of drugs, various other factors contribute to the mortality due to cancer, for this there is need to development of a new anticancer drug. In this work we choose human Rho-C, which plays a role in directly implicated in the invasiveness of cancer cells and the development of metastasis, the enzyme deemed necessary for survival of cancer cells. It seems to be good target to develop a new anti-chemotherapy against cancer. In this work the 3D structure Human Rho-C taken from PDB RCSB. The structural orientations of the epigallocatechin gallate (EGCG) clearly indicates distinctive affinities of Human Rho-C, this distinctive feature helps to may be inhibition of Human Rho-C and the supporting experimental studies on this data have been conducting in our lab.

Acknowledgements:

RSC, gratefully acknowledges University Grant Commission (UGC), New Delhi (F.No.33-222/2007 (SR) 13-3-08 & UGC Lr.No.F.4-1/2008 (BSR), dated 12-02-2010) for financial support. The encouragement given by Sri Krishnadevaraya University, AP, India to our research work is gratefully acknowledged

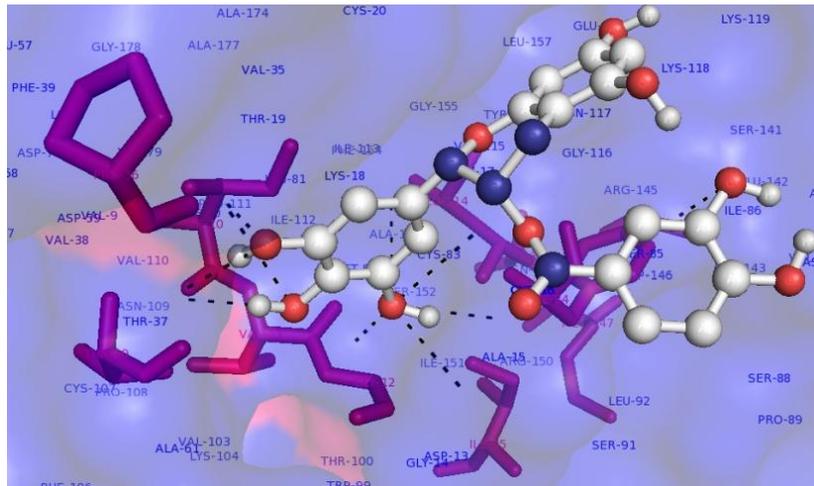


Fig.3 Protein-ligand docking interaction of human Rho-C represented in surface along with catalytic residues in stick form, and EGCG of green tea represented in ball & stick form. The image was generated using Pymol

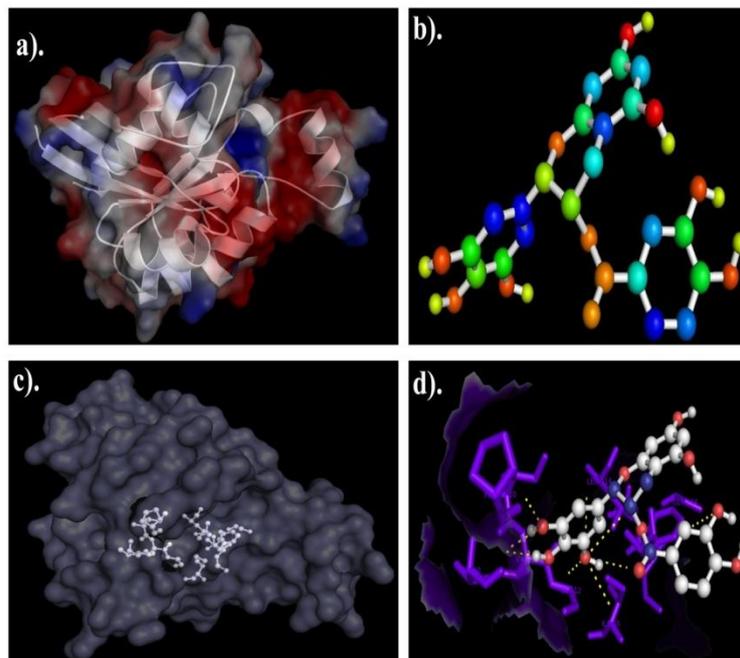


Fig. 1(a)3D Structure of Human Rho-C in electrostatic representation, (b). 3D Structure of EGCG of Green tea in ball & stick model representation (c) Docking interaction of human Rho-C (dark blue surface model) with EGCG of Green tea (white colored ball & stick). (d). Protein – ligand docking interacting amino acid residues on the human Rho-C with EGCG. The interacting region of human Rho-C is represented in Purple color sticks and the regions of EGCG are shown by ball & stick model. Polar contacts represented in yellow colored dotted lines. The 3D structure of the human Rho-C and EGCG complex was predicted by Protein docking using Autodock software

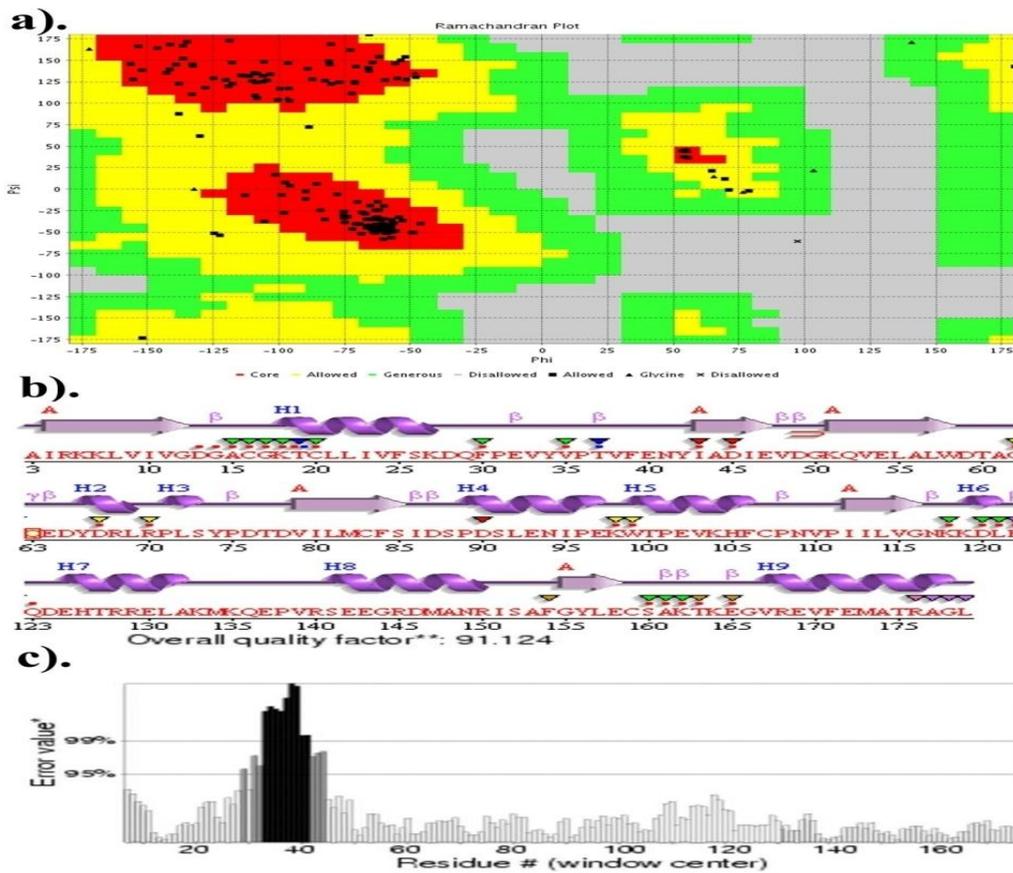


Fig 2 (a). Ramachandran plot of developed human Rho-C, in which 143 residues in most favored region (92.3%), 11 residues are additionally allowed regions (7.1%), and remaining residues generously allowed and disallowed regions (0.6%). (b). Secondary structure of human Rho-C taken from pdbsum. (c). The ERRAT score for the human Rho-C (2GCN) is 91.124, the backbone conformation and non-bonded interactions of human Rho-C was all reasonable within a normal range.

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A NOVEL APPROACH TO SECURE DATA USING ARMSTRONG NUMBER

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Abstract: Cryptography is used widely for the purpose of secure communication and password management. It comprises the techniques of encryption and decryption mechanism. Using the encryption mechanism a plaintext is converted into a cipher text and in decryption with the help of a secure key the encrypted message is decoded into a plain text. Mathematical principles can be employed for encryption determinants to encrypt and decrypt our message and to transmit them securely. Security of information has become a popular subject during the last decades. Since matrices have unique powerful concept, and can be easily understood, it could be applied as an efficient way of encrypting and storing text. It uses Armstrong number while encrypting and decrypting the data.

Key Words: Encryption, Decryption, data security, cryptography, cipher text

INTRODUCTION

With the rapid development of network and multimedia technologies, the digital information has been applied to many areas in real-world applications. Communication has become a very important aspect in today's life. So, security plays an important role in transferring the data. One such way to secure information is cryptography. Cryptography is an old art of sending secret messages between sender and receiver. With the advancement of internet technologies, cryptography becomes a crucial aspect for secure communications to protect important data from eavesdroppers. In this paper, Encryption and Decryption process applies to both data as well as its key. So that two way security is provided to the application. After successful authentication, data is encrypted by random Armstrong number and at the same time Armstrong number gets encrypted. Now for both these encrypted data and key, current system timestamp is attached. So whenever receiver gets both the data he can easily recognize which key is for which data. Then encrypted key is decrypted by sender's public key and that resulted Armstrong number is used to decrypt actual data. So it is difficult to hack the data and steal it. Once hacker steals the data, then he must have key by which that data is encrypted with its timestamp. If hackers get both data and key then he must know the decryption algorithm to retrieve both key and data which is very difficult.

CRYPTOGRAPHY

Cryptography is mainly a technique to keep communication private. It protects data from theft or alteration and also can be used for user authentication. Its main purpose is to ensure privacy by keeping the information hidden from anyone for whom it is not intended. There are two main steps involved in cryptography such as encryption and decryption. Encryption is the transformation of plain text into some unreadable form. Decryption is the reverse of Encryption; it is the transformation of encrypted data back into some readable form. The data to be encrypted is called as plain text. The encrypted data obtained as a result of encryption process is called as cipher text.

Types of Cryptographic algorithms

- Secret Key Cryptography- It uses single key for encryption and decryption. Eg: DES and AES
- Public Key Cryptography- It uses two keys for encryption and decryption. They are public and private keys. Both the sender and receiver both the keys. It provides message integrity and authentication. Eg: RSA algorithm
- Hash Function- This kind of algorithm uses a mathematical transformation to irreversibly "encrypt" information. MD (Message Digest) Algorithm is an example.

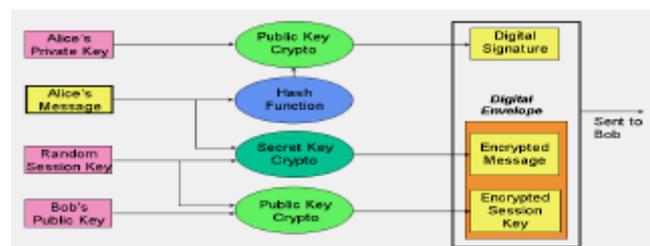


Figure 1: Types of Cryptographic Algorithms

DIFFIE HELLMAN ALGORITHM

It is a cryptographic algorithm that allows two parties to jointly establish a shared secret key over an insecure communication channel. This key can then be used to encrypt subsequent communications using a symmetric key cipher.

Steps:

- The sender chooses a large random number x such that $0 < x < p-1$ and calculates $R_1 = g^x \text{ mod } p$ where g is the generator of order $p-1$ and p is a large prime number.

2. The receiver chooses a large random number y such that $0 < y < p-1$ and calculates $R_2 = g^y \text{ mod } p$ where g is the generator of order $p-1$ and p is a large prime number.
 3. The sender sends R_1 value to receiver. Receiver sends R_2 value to sender.
 4. Sender calculates $K = (R_2)^x \text{ mod } p$.
 5. Receiver calculates $K = (R_1)^y \text{ mod } p$.
- Here K is the symmetric key for the session.

PROPOSED SYSTEM

Data authentication is done between sender and receiver. After successful authentication, we encrypt the data and send the data to the receiver. The encryption key Armstrong number is sent to the receiver. Using this key, receiver decrypts the encrypted data.

ILLUSTRATION

A. Encryption Process

1. Encryption is done using Armstrong number. An Armstrong number is an n -digit base m number such that the sum of its (base m) digits raised to the power n is the number itself. Hence 371 is an Armstrong number because $3^3 + 7^3 + 1^3 = 1 + 343 + 27 = 371$.
2. User generates the key using Diffie-Hellman key exchange algorithm.
3. Let the message be "DATASECURITY" to be transmitted. We find the ASCII equivalent of the characters.
4. Now add these numbers with the digits of the Armstrong number as follows:
5. Convert the above data into matrix as:

$$M = \begin{bmatrix} 71 & 74 & 94 & 76 \\ 72 & 132 & 428 & 91 \\ 85 & 70 & 83 & 90 \end{bmatrix}$$

6. Consider the encoding matrix as:

$$E = \begin{bmatrix} 3 & 7 & 1 \\ 9 & 49 & 1 \\ 27 & 343 & 1 \end{bmatrix}$$

7. Multiplying the two matrices M and E as $E \times M$ we get C (Encoded Matrix)

$$C = \begin{bmatrix} 3 & 7 & 1 \\ 9 & 49 & 1 \\ 27 & 343 & 1 \end{bmatrix} * \begin{bmatrix} 71 & 74 & 94 & 76 \\ 72 & 132 & 428 & 91 \\ 85 & 70 & 83 & 90 \end{bmatrix}$$
$$= \begin{bmatrix} 802 & 1216 & 3361 & 955 \\ 4252 & 7204 & 21901 & 5233 \\ 26698 & 47344 & 149425 & 33355 \end{bmatrix}$$

The encrypted data is 802, 4252, 26698, 1216, 7204, 47344, 3361, 21901, 149425, 955, 5233, 33355. The above values represent the encrypted form of the given message.

B. Decryption Process

1. Decryption involves the process of getting back the original data using decryption key.
2. We need to authenticate the receiver only when the keys from sender and receiver match. We now need to decrypt the encrypted message.
3. Find the inverse of the encoded matrix E .

$$E^{-1} = \begin{bmatrix} -7/24 & 1/3 & -1/24 \\ 1/56 & -1/42 & 1/168 \\ 7/4 & -5/6 & 1/12 \end{bmatrix}$$

4. Multiply the decoding matrix with the encrypted data ($E^{-1}XC$) we get:

$$M = \begin{bmatrix} 71 & 74 & 94 & 76 \\ 72 & 132 & 428 & 91 \\ 85 & 70 & 83 & 90 \end{bmatrix}$$

5. Now transform the above result as:
71, 72, 85, 74, 132, 70, 94, 428, 83, 76, 91, 90

6. Subtract with the digits of the Armstrong numbers as follows:

	7	7	8	7	13	7	9	42	8	7	9	9
	1	2	5	4	2	0	4	8	3	6	1	0
-	0	0	0	0	49	0	2	34	0	0	0	0
	3	7	1	9		1	7	3	1	3	7	1
	6	6	8	6	83	6	6	85	8	7	8	8
	8	5	4	5		9	7		2	3	4	9

7. Obtain the characters from the ASCII equivalent as:

68	65	84	65	83	69	67	85	82	73	84	89
D	A	T	A	S	E	C	U	R	I	T	Y

ADVANTAGES

This minimum key length reduces the efforts taken to encrypt the data. The key length can be increased if needed, with increase in character length. Tracing process becomes difficult with this technique, because the Armstrong number is used differently in each step. The key can be hacked only if the entire step involved in the encoding process is known earlier. Simple encryption and decryption techniques may just involve encoding and decoding the actual data, but in this proposed technique the password itself is encoded for providing more security to the access of original data.

DISADVANTAGES

Diffie-Hellman key exchange algorithm involves expensive exponential operations. The only way to break into this system is by Brute force attack, which also can take up to two or three years. The speed of execution is slow because the file size after encryption is much larger than original file.

CONCLUSION

The above combination of Diffie-Hellman key exchange algorithm and Armstrong number proved to be the more efficient and reliable technique for data exchange between two parties. The combination provides two way securities. This technique provides more security with increase in key length of the Armstrong numbers. In this algorithm we use digital signature hence this algorithm defend against man-in-middle attack and provide more security.

ACKNOWLEDGMENT

We would like to thank Dr. K. VijayaLakshmi, Director and Head for the Department of Mathematics, Statistics and Computer Science for her encouragement, suggestions and motivation.

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CLUSTERS IOT ENVIRONMENTS WITH SECURITY MECHANISMS

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Abstract: Internet of things manages the entire process and the generated data is based on sensors, communication networks and intelligence. Sensors can be used in large quantities because they are the senses of system. The security of these network devices, data sensors and other devices is a major concern. Because sensors must have low cost and power consumption, great flexibility and small size for its use in all circumstances. These devices grow rapidly in terms of nodes interconnected via sensor data. On Internet of Things (IOT) this paper presents an analysis from a systematic and statistical review point of view of articles, at privacy level and control access the security aspects are specifically tested in this type of environment. Finally, it presents an analysis of various addressed security issues, from different clusters are identified with in the fields of application of this technology.

Keywords: Internet of Things, Information Security, Network Security, Privacy of Data, Secure Connections.

INTRODUCTION

Internet of Things (IOT) is defined as a dynamic composed of a large number of objects able to communicate and interact with each other, with end users [1][2][3] and also as a global network infrastructure. So that it is considered as an integrated part of Internet. All objects in the Internet of Things must have unique identities which allows interactivity. Privacy and data protection is substantial [4] in order the need to create networks that interact with various devices because of the accelerated enhanced of devices connected to Internet. Devices connected to Internet is growing rapidly because of the actual well known aspect of the information security. In the network it represents an exposure increase on data.

To neutralize vulnerabilities at IOT, a security infrastructure proposed in this paper. It uses mechanisms such as (PKI). Based on a combined public key PKI allow identity authentication. By performing an analysis of fingerprint recognition [5], a solution given on this issue. Proposed a 3-layer model (sensor, transport, application), enabling the analysis of each of the components involved in the process. Communication media is another security related problem addressed in [4]. I used RFID systems and a microchip combined memory incorporated, to receive a signal and return it with some additional data (unique serial number) so that a system is created.

An overview of challenges presents on IOT security levels in this study. In the environment of Internet of Things it is presented the safety and the state of the art related to Internet that is specifically about security mechanisms involved in it and on the other hand, in the performance of application and security how it is presenting an analysis of factors which are involved in it, and the security methods are identified to be implemented in IOT environments. Under the principles of authentication, access control and authenticity a classification as a proposal has been introduced to achieve this purpose. It is important to characterize the type of RFID devices, connection types, work settings and security mechanisms for this model. In order to facilitate the acquisition of devices to be used in different work environments such as industrial level, home or Smart Grid the mechanisms that could be applied for this purpose.

This paper is organized as follows. The theoretical framework problems identified in the area of security and related work presents in the Section 2. The methodology for the literature review and analysis are described in Section 3. A proposed security model according to areas of interest worked in IoT is presented in Section 4. Conclusions and the future work is presented in the final Section.

BACKGROUND

Review Stage: The exchange of goods and services globally [6] facilitated by Internet of Things (IOT) recently has become a trend at homes given the evolution and mass communications through the network. Various sensors in accordance with [7] monitoring households through security cameras, motion detectors which are connected to the Internet to handle them easily, and to the user the follow of valuable information is reaching successively. Tranquillity is suitable to all these factors for example, having a Smartphone connected to Internet being able to monitor home from anywhere in the world. These constant monitoring levels [8] are exposed to confident levels to analyze the risks, for example, the network points and transmission thereof. The processes of encryption and authentication of this need to be reviewed in the final conclusion. So that the user is not the only one who can see and monitor his home, might be this would be a relatively easy task for an intruder, so that the privacy and security of a house exposing and becoming a vulnerable.

Wearable's are the most popular devices are leading the expansion of IoT: small devices which can capture information from certain activities need to be carried out and that can be wear by a person. The user can receive the information about time, weather or even notifications on the same or on a mobile phone linked with that user. With other devices or social networks, they are able to receive mail, messages, and even calls, in the synchronized activity, so in most cases the information is stored in the cloud.

In the real world, IOT links computer systems through physical objects, which allow having real-time information [7]. A lot of information should travel safely from objects (sensors, actuators, RFID tags, etc.), to the data centre and from there to devices such as Smartphone or PC. Based on the information it reaches these devices can make decisions. IOT brings new challenges in security aspects; it is the development of IOT.

Related work

To build a safety and reliability system in the IoT context, IoT becomes a focus aspect. May be the rapid development of information technology and Internet security information about IoT, new problems and potential security over information has been raised. A general architecture of trust [9] has been worked from this problem, it mainly includes a trust module (users being the central part of the system), terminal confidence module (operate according to rules of control), perception of trust module (full authentication), trusted network module (designed to analyze, evaluate and manage security situations) and a trusted agent module (avoid the potential risks caused by access terminals do not reliable). Based on the results of these modules development, to address security issues there was a development model, to the security problem it does not provide a specific solution.

As the communications infrastructure of the Internet evolves to include detectable objects, appropriate mechanisms will be needed to ensure communications with these devices in the work done by [10] in the context of future applications of IoT, in the areas of diverse as health (eg remote patient monitoring or control of the elderly) and smart cities (eg distributed pollution monitoring, intelligent lighting systems), and among many others. This trend is also reflected in the efforts carried out by normative agencies such as the Institute of Electrical and Electronics Engineers (IEEE) and the Internet Engineering Task Force (IETF), to design communication technologies and safety the IOT.

Identify security problems

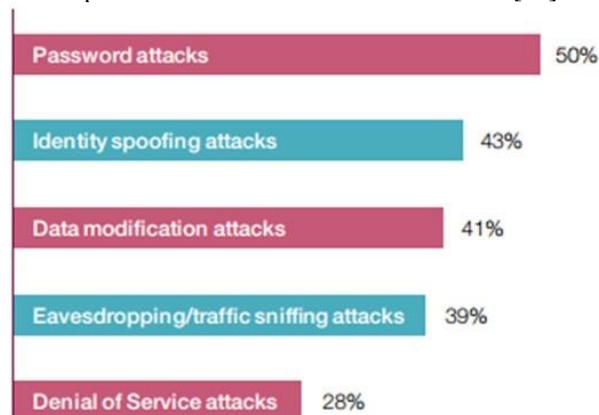
As a virtual representation, the atmosphere of Internet of things can be summed up in the network of physical objects. To activate windshield wipers and brakes of cars only through text messages [11] the data interception is real and possible that is managing all like tracking the vehicle navigation system [13], handling electronic devices of the vehicle [12], annulment of the navigation system of a luxury yacht running around in the middle of the Mediterranean [14] sea among others.

From the start design of any product, security is a factor that should be taken into account. At industrial sector where signals are forged through networks or wireless sensors are analyzed. More worrying when heating systems, lighting and security of households are tapped to be changed and transgressed [6][7][15][16].

About 70% of Internet things devices are vulnerable to attack, according to a study from Hewlett Packard [17]. Most of the devices had a service oriented to the cloud and had a mobile application such as security cameras, thermostats, alarms, door controllers were studied, among others. The following were highlighted from about 25 vulnerabilities for each device:

- i) Insecure web interface
- ii) Privacy issues (delve respect to the rights inherent human beings to this principle).
- iii) Inadequate protection software.
- iv) Insufficient authorization.
- v) Lack of encryption

In Fig. I. the report of the most common threats in IoT [17] is



presented.

Fig. I. The Top most common threats of IoT products (Capgemini consultant)

Without proper security now a days the information such as social security numbers (SSN), credit cards and other sensitive data travel over the network was highlighted in Hewlett Packard's report.

RFID and ubiquitous network technology sensors have become two major parts of it, on the other hand with the development of IOT. RFID is a type of automatic identification technology without contact identifies objects through RF

signal and collect data. Possibly it is working in different environments and identifying objects, according to [18]. For the IoT, RFID is prerequisite. There are three layers in the IoT in general:

The lower level is the perception layer, includes RFID tags, GPS, sensors, literacy devices, cameras, laser scanner, and so on. It is mainly used to capture, gather, distinguish and identify object information. *The second level* is the network layer acts as a mediator, with the support of reliable communication this layer is used to transmit and process information obtained by the layer of perception and provides such information to the application layer. *The upper level* is the application layer, implements control and information management, making use of cloud computing, data mining etc., is used to process data intelligently, and from various sources the aggregation of data with different types.

For building a reliable security information, IoT to be a controllable, creditable and independent network. This model provides a theoretical framework.

To include detectable objects, appropriate mechanisms will be needed, this can be evolved by the communications infrastructure of the Internet. These mechanisms are needed to ensure communications with these devices [10] in the context of future applications of IOT, like smart cities (eg distributed polluting monitoring, intelligent lighting systems) and health (eg remote patient monitoring or control of the elderly), among many others. This trend is also reflected in the Institute of Electrical and Electronics Engineers (IEEE) and the Internet Engineering Task Force (IETF). These are used to design communication technologies and safety the IOT. A stack of protocols formed by such technologies required for IoT with various communication technologies; about this work done by [19] is discussed detailed.

Using microcontrollers such as Arduino code [20] some applications such as a monitoring system houses and working. A processor used by Arduino Atmel AVR that can be programmed in C language. We can also interact with other devices through the USB port. To connect the Home Gateway to the local proxy the Ethernet module acts as a bridge. Three main modules in this application are: software package (Smartphone app), hardware interface modules and web micro server. For the surveillance system using Android-based Smartphone ensuring low costs and home control flexibility, this work proposes the implementation of a new architecture. Web services based on Representational State Transfer (REST) used by the proposed architecture, acts as a layer of interoperable communication between the remote user and the application home devices.

The analysis work from these references was classified aspects from clusters defined on IoT area.

METHODOLOGY

To identify the related works I carried out three phases, in order to make an analysis of literature review. I used the keywords in fields related to security issues in IoT environments in databases such as IEEE, ACM and Scopus (Table I) in the first preliminary phase.

TABLE I. REVISION PRELIMINARY

Keyword of search	Data base	# of results	Reviewed articles	Related articles
Security IOT	Scopus	1.134	89	32
Security internet of things	ACM	224	29	23
Security IOT	IEEE	143	27	21
Total	--	1501	145	76

A review of the abstracts and conclusions from 78 potential publications related to the security area in IoT was done. It was identified that majority was not related to security issues when checking a large number of related work.

In the second phase safety was performed where a combination of the greatest number of occurrences of words used in IoT. Study was conducted by [21] (Table II).

The first five most frequently phases, such as 'IoT and security', 'Middleware', 'RFID', 'Internet', 'Cloud computing' were taken for this study purpose. The final third phase was to classify the most frequent problems from the basic security principles. Table III shows the results of this study.

TABLE II. Word frequency in iot environments (YAN, ET AL,

No.	Frequency	Keywords
1	379	Internet of things
2	112	Wireless sensor networks
3	54	RFID
4	28	Security
5	22	Cloud computing
6	14	6LoWPAN
7	11	CoAPs
8	11	Future internet
9	10	IPv6
10	10	Machine to machine
11	10	Privacy
12	10	Ubiquitous computing
13	10	Web of things
14	10	Web services
15	9	Environmental internet of things
16	9	Internet
17	9	Middleware
18	8	Cyber physical system
19	8	Quality of service
20	7	Energy efficiency
21	7	Machine-to-machine communications
22	7	Performance
23	7	Smart objects
24	7	Social networks
25	6	Cloud manufacturing
26	6	Pervasive computing
27	6	Semantic web
28	6	Trust

2016)

Two more frequent problems were identified in table III: user authentication, data encryption.

TABLE III. Paper revision in specialized data bases

PROBLEM	# PAPERS	%
User Authentication	33	45.2%
Traffic filter	18	24.6%
Data encryption	25	34.2%
Intrusion detection in real time	1	1.3%
Devices and applications protection	17	23.2%
Secure localization	7	9.5%
Quality service	1	1.3%
Secure connectivity between objects	12	16.4%
Secure protocols	15	20.5%
Information storage	2	2.7%
User resistance	1	1.3%
vulnerable Interfaces	1	1.3%
Cost	3	4.1%
Malware	4	5.4%
Unsecure Software, Hardware	11	15.0%
Unsecure Web interface	2	2.7%
Information theft	9	12.3%

SECURITY MODEL PROPOSED

A categorization of the issues and technologies was made, due to Internet of Things is a large field with various technologies. For analyzing details of security and privacy in the respective fields this categorization was made.

A categorization of the issues and their respective technologies was in Figure II. Eight major areas within the IoT were identified which must be specified in the level of security related studies, according with Figure II. They are described in detail:

- *Communication:* Integrity, authenticity and confidentiality are provided by the communication protocols such as TLS or IPSec. Onion Routing or Freenet routing schemes have been addressed the privacy needs.

- Sensors:** As described by [22], both the integrity and authenticity of the sensor data can be handled as watermarking. The only vulnerable condition is the confidentiality of data. That was the reason the need for confidentiality is low in the sensor. So based on the confidentiality of communication the confidentiality is measuring, in order to preserve the privacy of individuals and objects mechanisms such as face blurring video data are important.

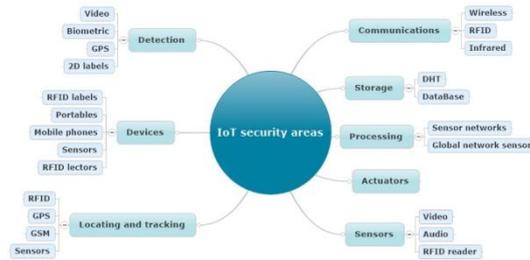


Fig. II. IoT security areas identified

On the communication infrastructure sensor availability mainly depends on. To preserve the privacy of individuals who are currently most often unconscious on the sensors, such as video cameras, regulations are necessary.

- Actuator:** On the security of communications an actuator depends primarily with the authenticity, integrity and confidentiality of data.
- Storage:** For storage devices security mechanisms are well established. To provide an adequate response to user privacy protection, data storage is highly considered. But data storage is highly sensitive to privacy and there are many cases of violation of privacy regulations should be widely distributed. On the availability of the communication infrastructure and well-established mechanisms for redundancy storage, storage availability mainly depends on.
- Devices:** “Admissibility” is a property which means that within the field of integrity of the devices, a device is free from malware. Which was worked by B. Schneier, a presently open issue, researched on Trusted Computing Platform (TPM) and it is highly sensitive. All the communication parts handled by the authenticity of a device, but not by the end point of communication. When no third party has accessed to internal data devices then the confidentiality of a device with integrity is ensuring.

On the physical privacy and privacy of communication the devices privacy depends.

TABLE IV. Recommendation criteria in security areas

Properties	Security principles					
	Integrity	Authenticity	Confidentiality	Privacy	Availability	Regulation
Communication	High	High	High	Media	High	Low
Sensors	High	Medium	Low	High	Low	High
Actuators	Low	Low	Low	Medium	Low	Media
Storage	High	Medium	High	High	Low	High
Devices	High	Low	Low	Medium	Medium	Medium
Processing	Medium	Low	Low	High	Low	High
Location and tracking	Low	Low	High	High	High	High
Identification	Media	Baja	Alta	Alta	Alta	Alta

- Identification:** Than Location and Tracking it uses same sensitivities. On the integrity part, one difference is the higher sensitivity. To manipulate the identification process is an easier task for an attacker, as the identification process is handling the localization process. Here the technology used (eg RFID or biometrics) is more likely that an attacker manipulate location technologies (eg GSM). That was the main reason for translation.

To determine the relevance of the security level on each of the areas identified in table IV, criteria are defined from the basic classification.

CONCLUSIONS

Protection of information traveling through devices is one of the key measures. Since the IOT devices are eminently focused on sending information between devices, or from them to Internet; through wireless networks or public networks this information travels, because which are vulnerable to being attack.

For an attacker to carry out attacks it becomes easy, if the communication channel is not adequately protected by encrypting data. The customer traffic can be captured by the attacker, rectify it to pretend to be the originator of it, and

send it to the legitimate server, so that it acts as an intermediate point in communications, invisible to both: the source and the destination of traffic. Thus, even the message was modified, people can get all the information they want, so they will not take the right decisions regard of the original information even if the behavior or performance of the device, or even send false information to users.

IOT devices uses cloud services is the another common feature characteristic to a large quantity of IOT devices. Other potential risk in this case for these applications, for example, intruder would be able to access the information store and even take control of the IOT devices if there are deficiencies in the management or update the platforms.

Into the availability of communication there is a specific need for research due to DDoS and service provided by IP. From malware such as spyware or rootkits the integrity of the devices must ensure their freedom, so seeing the need for more research. In the privacy of Internet of Things, finally almost all areas lack mechanisms applicable.

On a Smartphone for any type of management, finally using mobile applications that are installed either to obtain data or to control the device. As a result, mobile applications can also be the target of attacks, either by developing malicious applications that emulate the behavior and appearance of legitimate access to the IOT devices or by exploiting vulnerabilities or deficiencies in its implementation.

From an ontological model and intelligent agents the future work can be carried out, where the appropriate identification of security mechanisms need to be carry out a characterization of these problems from most frequent problems in clusters of application of IoT. This would facilitate security alternatives identification, deployment access models for IoT devices first.

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A NOVEL APPROACH TO DATA MINING ALGORITHMS IN INTERNET OF THINGS APPLICATIONS

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Abstract—Internet of Things is now an accelerating technology in the world of devices. It helps us to connect all the devices which we use in our day to day chores via the internet. Starting from home, office, industry automation to health care and smart cities internet of things has revolutionized the world by interconnecting them. As a result it generates massive volumes of data. For many this data has immense business value and information. This is where data mining comes into play which makes such kind of systems smarter enough for better efficiency and greater opportunities and services. This paper introduces to the Internet of Things technology and states the need of data mining in a world where everything is delivered over the internet and explains the process and suitable algorithms required for Internet of things.

KeyWords: Data mining, Internet of things, Knowledge Data Discovery.

INTRODUCTION

Internet of Things (IoT) is an emerging technology whose basic idea is to connect all the physical devices. The following is the definition of Internet of things given by S. Haller et al. [1] IoT: “A world where physical objects are seamlessly integrated into the information network, and where the physical objects can become active participants in business process. Services are available to interact with these ‘smart object’ over the Internet, query their state and any information associated with them, taking into account security and privacy issues.” In a world where people are trying to develop machines which can think on their own, data mining has proven to make an IoT [2] system smarter. It is also anticipated that by 2020, the amount of internet connected things will reach 50 billion. These smart commodities connected via the internet could be sensor networks, RFID technology, and various handheld or mobile devices. The data produced by these commodities is huge in volume. Consider an IoT system for temperature and humidity monitoring of a garden or a farm. Here the temperature and the humidity detecting sensors are connected all over the place and these sensors send data every hour and that each sensor sends one megabytes of data per day, and so if there are 100 such sensors in a farm, the data collected will be in enormous amounts for a system. To maintain and generate some valuable business information out of it, data mining is necessary. Now the challenge is to make this system smarter, what if this system helps the farmers to predict the climate given by the temperature and humidity sensors, an efficient graph is plotted reporting various attributes like soil moisture information, by pH sensors report the acidic level of soil which can help the farmer to decide whether or not to use fertilizers, irrigate only at a particular place by checking if the water level is low which is given by the data procured on the moisture sensors and the graphical report of the level of water in the soil by minimizing water wastage and land clogging. The main intention was to show that data mining is making this low cost system so efficient and easily manageable. There are various processes and algorithms in data mining, so to select a particular algorithm for a particular IoT system is also a challenge now.

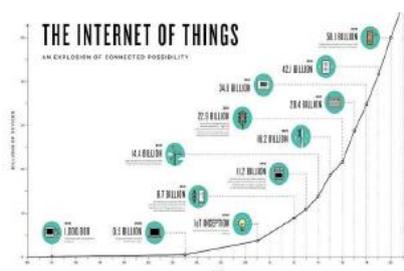


Fig. 1. Here we can see the growth of devices connected over the internet which is increasing rapidly over a couple of years.

DATA MINING

Data mining is described as the process of extracting valuable or sensible information from a huge set of data using patterns or the relationship between the data to generate revenue or sometimes to cut costs also. Data mining is also exemplified as Knowledge Data Discovery (KDD). A simple process model used popularly in data mining will be discussed in this section and also how this is reliable to implement for all the IoT systems with a basic suitable model will also be discussed further.

A. Data Mining Processes

There are two ways to explain the data mining process. One is the KDD processes with seven stages whereas the other process model is the Cross Industry Standard Process for Data Mining (CRISP – DM) which has six stages inclusive of Business Understanding. For solving our present scenario which is to manage the huge data from IoT and apply suitable data mining technique, we will first look up the seven stages in the KDD process which are as follows –

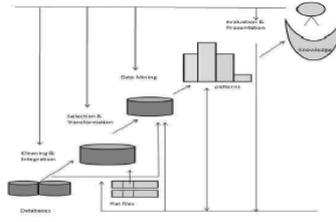


Fig. 2. The figure depicts the basic process model of Knowledge Data Discovery which comprises of cleaning, integration, selection, transformation of data followed by pattern evaluation and presentation.

- a. **Cleaning:** The erratic data which has no role in providing valuable information is to be removed.
- b. **Integration:** This process is to associate various types of data.
- c. **Selection:** In this step the pertinent data is to be restored from the database to achieve proper knowledge by analyzing appropriate data.
- d. **Transformation of data:** The term transformation itself states that there is a change in the state of data, i.e., the data's format is changed from the source system to the destination system by performing various operations on it such as mapping or summation.
- e. **Data Mining:** As mentioned above, this step is to extract information from the database on the basis of the required patterns using suitable algorithms.
- f. **Evaluation:** Through which pattern the data is being extracted and information is generated is evaluated to ensure the correctness of the information.
- g. **Presentation:** Finally, the information required is plotted in the form of graphs or other statistical methods for better understanding.

The above mentioned seven stage KDD processes are the typical process stages under which data mining is performed.

B. Suitable Data Mining Processes for IoT

We live in a world where the speed with which the business needs to move is much faster than the time it takes to conceive and launch new solutions in the areas of big data, data mining, cloud, and IoT [3]. Variety of data mining algorithms should be built with various capabilities to get insights and reduce the risk of project failures. Most of the mining techniques are developed to execute on a single system, so these KDD systems cannot be applied directly to process big data of the IoT system, whereas for a small system these KDD processes can be applied directly. To develop a high geared data mining structure of KDD for an IoT system the following three points [5] are to be considered to elect the suitable mining technology, and they are –

- a. It is essential to understand the definition of the problem, their limitations and required information and so forth.
- b. The major concern would be to understand what kind of data is to be required like the representation, size of data, processing of different data etc.,
- c. A suitable data mining algorithm is to be chosen to bring out sensible and required information from the raw data.

C. Data Mining Algorithms

- a. **Classification:** It is a function of data mining that delegates items into categorical labels. It helps us to predict the category of a particular item in a dataset. Let's consider a scenario where a marketing manager of an automobile company wants to analyze the probability of a customer buying a type of car on the basis of his/her profile. A classification model can be utilized to predict the type of car; family, sports, truck or van, that a customer is likely to buy on the basis of his/her age and family background. There are various classification models such as decision tree, neural networks, IF - THEN rules depending upon their use.
- b. **Clustering:** It is typically defined as categorizing the data into some sensible, meaningful groups or classes. This helps to achieve an easy perceptible for the users by grouping naturally. The best example for this could be a search engine which is based on clustering, that can categorize endless web pages into news, images, videos, reviews etc., there are various clustering models such as k-Means clustering, Densitybased clustering and Hierarchical clustering that can be used depending upon their use.
- c. **Association Analysis:** Market basket is the best relatable module to association. Market basket analysis is observed routinely in supermarket chains where the items which are likely to be bought together with another set of items are always placed together such as toothbrush and toothpaste are always in the same section. This helps in decision making. At first the data is processed incessantly, for first catalog of association analysis. To discover inter transactional association apriori algorithm has been used followed up with association discovery. Other algorithms used are pattern growth, event-oriented, event-based, partition based, FP Growth, Fuzzy set and incremental mining.
- d. **Time Series Analysis:** When data points are present in consecutive time interval, time series analysis is applied to extract meaningful related to specific patterns or statistics. Stock market index value is analyzed in a time series manner. Time series analysis is also used in forecasting, to analyze dependent events; that is to predict future values based on past events

- e. **Outlier Detection:** Occasionally there exists a data which is not compliant with general behavior or model of the data. This kind of data is different from remaining set of data which is called as outlier. This type of data contains useful information regarding aberrant behavior of the system comprised of outliers. Outlier analysis can be used to extrapolate outliers, to calculate distance among objects, distribution of input space.

The above mentioned data mining functionalities with the listed algorithms are the most commonly used algorithms in any field to mine the data and extract the required information.

RELATING IOTAPPLICATIONS AND DATA MINING

As there is a rapid growth in the devices and sensors connected over the internet, we have lot of applications in this field. Some of the successful applications are listed below.

A. *Smart City*

The various IoT systems in a smart city are discussed below relating it to the appropriate data mining functionality used to make the system better and smarter.

- 1) **Traffic Control:** IoT devices such as GPS, smart phones, vehicle sensors deployed across the city can provide data points such as travel time, frequency of heavy vehicles, accident prone zones and construction areas. The congestion in the targeted area can be provided through data points. Here, classification algorithm can be used to solve traffic congestion problem. Targeted areas can be classified depending upon the high, medium, low probability of occurrence of traffic jam in a particular area. Classification model can be used to predict the time of the day where the congestion will be at the peak and alternative route can be used to arrive at the destination. This will distribute the traffic and avoid congestion.
- 2) **Residential E-meters:** Conventional meters are being rapidly replaced with smart meters as they provide real time data about the energy consumption in digital format through email or even on smart phones. However, Time Series analysis on time series data, which is automatically gathered at different intervals throughout the day can be used to predict energy consumption, provide notifications by any means if any anomaly is detected in energy consumption. Synthetic data can be generated from available real data, which can be used for forecasting.
- 3) **Pipeline Leak Detection:** Maintaining water pipe leaks for municipal corporations is a cumbersome job. Especially with old pipes, with the use of sensors sound of water passing through can be analyzed using outlier detection algorithm to identify leaks. Hence, taxing job of detecting water leaks can be simplified and in addition, cost of maintenance can be reduced to the half as compared to the conventional method.

B. *Home Automation*

Data generated by IoT devices used in home automation can be mined to generate meaningful patterns. These patterns can be used to predict future events and provide automated interaction with the user. Home automation requires classification and time series analysis models. Where interactive devices are connected together can be classified upon their usage. Data generated by these devices can be stored with their corresponding timestamps, this data can be used in forecasting to predict occurrence of an event at a particular time, using linear regression.

C. *Health Care*

IoT systems offer innumerable services for users to check on their health such as calorie burnt, blood pressure, blood glucose, heart rate, weight measuring devices and pulse oximeters and store the data on some cloud based platforms maintained by required hospitals. In order to make these intelligent a system should be developed to integrate these heterogeneous data and give accurate information about the patient. The patient doctor specific prescriptions and medical history can be text mined and draw important conclusions about the present condition of the patient[6], chances of survival of the patient, and clustering [7] can be done for the better treatment and care of the patient. We could also outlier it to identify any unusual patterns which will be easy in detection of any fraud.

CONCLUSION AND FUTURE SCOPE

In this paper, we have discussed about the new emerging technology that is Internet of Things (IoT), later moving on to how data mining is an important part of IoT which makes these systems smarter by discussing the general processes of data mining. Also we have seen key points to keep in mind while selecting an appropriate algorithm for an IoT system. Further discussion was about the widely used data mining functionalities with their specific algorithms and various IoT applications relating it to the suitable data mining functionality applied to enhance the system for better services.

Finally, an IoT system which has the potential to acquire proper insights from these huge oceans of data available are reliable in today's fast pacing world.

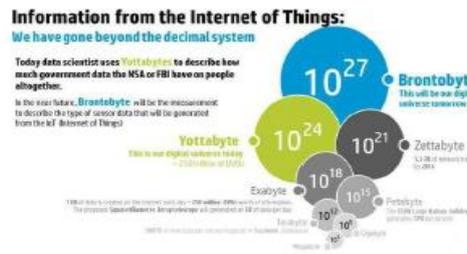


Fig. 3. This figure depicts the future of Internet of Things.

- Big data analytics for IOT software revenues will experience strong growth; reaching \$81 billion by 2022 says Strategy Analytics.
- Smart Cities will use 1.6 billion connected things in 2016
- By 2025 IOT will be a \$1.6 trillion opportunity in Healthcare alone
- 50 billion+ connected devices will exist by 2020 Data captured by IOT connected devices will top 1.6 zetta bytes in 2020

ACKNOWLEDGEMENT

The authors would like to thank the management for giving us an opportunity to publish the paper. We would like to thank our department members for extending their cooperation and support in completing the paper.

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DETECTION OF MULTIPLE BLACK HOLE ATTACK FOR AODV PROTOCOL IN MANET

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Abstract: Mobile Ad-Hoc Network (MANET) is a self-configuring, infrastructure less network consisting of nodes that communicate with each other via wireless medium. Each node moves freely in any direction and changes their links to other devices very frequently. Security is one of the primary concerns of MANET. Due to its dynamic topology, resource constraints, no centralized infrastructure and limited security, MANET can be subjected to many attacks and black hole attack is one of them. The malicious node advertises that it has the shortest path to destination and replies with false information for the route request, thereby dropping all packets intended to the destination node. Hence data loss will occur as data packets are not moved to the destination node. There can be more than one black hole attack present in the network which can work individually or as a group. In this paper, the main objective is to describe the black hole attack on routing protocol and provide an algorithm in detecting attack.

Keywords: MANET, Black hole attack, AODV, malicious node, detection

I. INTRODUCTION

Wireless network has been gaining popularity as the users are able to communicate with each other irrespective of their geographical position. A number of nodes can be connected via radio waves. When a computer device wishes to communicate with other device, it must be within the radio range of each other. It is becoming popular as it is easy to use. In the wireless network, the nodes can communicate directly or through a centralized medium such as base station or an access point. Cellular networks are basically considered as the infrastructure dependent networks where the communication as well as authentication between two nodes is done by using a base station.



Figure 1: A cellular network and Ad-hoc Network

Ad-hoc network is considered as infrastructure-less, dynamic topology having no central authority and an open medium. Further the ad hoc network is classified as SANET (Static Ad hoc Network) and MANET (Mobile Ad hoc Network). The routing process is complex when compared to cellular network. In static Ad hoc network, the mobility of host is not available. The geographical position of nodes is fixed. But in case of Mobile Ad hoc networks, there is dynamic topology that can change rapidly because the nodes move freely and can leave or join the network.

MOBILE AD HOC NETWORK

Mobile Ad hoc Network (MANET) is a self-organizing and infrastructure less network where the communication between the nodes is communicated through radio waves. The various nodes which are within the same radio range can communicate directly and can relay the packets to other nodes. The intermediate nodes are responsible to forward the packets towards destination. So, each node in MANET can act as host as well as router. Each mobile node can move freely in any direction, and changes their links to other devices frequently. Due to its dynamic topology, the nodes can leave and join the network at any point of time. The protocols in MANET allow the nodes to discover the optimal route to transfer the data packets. It is one of the primary challenges in MANET to find out the optimal path in this dynamic multi-hop network. It allows the heterogeneous devices to communicate with each other like laptops, PDA, mobile phones, sensors, palm pilot etc. These devices vary in their size, computational power, memory, and battery capacity. As the nodes are performing the role of host and router, the battery consumption is one of the hindrances. So, before deploying the ad hoc network the various issues, like spectrum allocation and purchase, dynamic topology, efficient routing, battery consumption, bandwidth constraint, collisions, scalability, providing QOS, multicasting and security need to be addressed. The mobile nodes in MANET can be quickly deployed for various applications like in emergency and rescue operations when any natural calamity happens. In disasters like earthquakes and floods, it is difficult to deploy centralized infrastructure dependent network.

Ad hoc network can be deployed easily and quickly but Security is an essential issue in the ad hoc networks. The military information is sensitive and needs to be prevented from security threats. Because of open wireless medium, dynamic topology, limited resources like bandwidth and power, there is more chances of security attacks in MANET.

AODV PROTOCOL IN MANET

Ad Hoc routing protocols are commonly divided into three main classes: Proactive, reactive and Hybrid. Proactive protocols are table driven. There is a predefined route from source to destination. But in reactive, the route is dynamic and is constructed on demand. Hybrid protocols use both proactive and reactive routing protocols.

Ad-hoc On-Demand Distance Vector (AODV) Routing Protocol is used for finding a path to the destination in an adhoc network. We need to pass control messages to all mobile nodes to find path to destination. AODV Routing Protocol offers quick adaptation to dynamic network conditions, low processing and memory overhead, low network bandwidth utilization with small size control messages. It uses a destination sequence number for each route entry. The destination sequence number ensures loop freedom is generated by the destination when a connection is requested from it. AODV makes the route to the destination and has the shortest path. Route Requests (RREQs), Route Reply (RREPs), Route Errors (RERRs) are control messages used for establishing a path to the destination, sent using UDP/IP protocols. When the source node wants to make a connection with the destination node, it broadcasts an RREQ message. This RREQ message is propagated from the source, received by neighbors (intermediate nodes) of the source node. The intermediate nodes broadcast the RREQ message to their neighbors. This process goes on until the packet is received by destination node or an intermediate node that has a fresh enough route entry for the destination. While the RREQ packet travels through the network, every intermediate node increases the hop count by one.

BLACK HOLE ATTACK IN MANET

As wireless ad hoc network are infrastructure-less they are exposed to lot many attacks. One of these attacks is the Black hole attack [9]. It is network layer attacks which have dropped the entire packet by sending fake packet to source node or other node. A malicious node absorbs all the data packets intended for the destination node thus creating a hole dropping all the packets. A malicious node dropping all the traffic in the network makes use of the vulnerabilities of the route discovery packets of the on-demand protocols, such as AODV. In route discovery process of AODV, intermediate nodes are responsible to find fresh path to the destination, sending discovery packets to the neighbor nodes. Malicious node does not use this process but they immediately respond to the source node with the false information as though they have fresh path to the destination. Source node therefore sends its data packets to the destination node via malicious node assuming that a true path is found.

To carry out black hole attack, malicious node waits for neighboring nodes to send RREQ messages. This node does not check its routing table and immediately sends a false RREP message giving a route to destination assigning high sequence number in the routing table of the victim node before other sends an actual one.

Therefore, the requesting node assumes the route discovery process is completed and ignores other RREP messages and begins to send the data packets to the malicious node. Malicious node attacks all RREQ messages this way and takes over all routes. Therefore, all packets are sent to a point when they are not forwarded anywhere. This is called a black hole akin to real meaning which swallows all objects and matter. To succeed a black hole attack, malicious node should be positioned at the center of the wireless network.

The fresh route means that the intermediate node must have the highest sequence number and minimum hop count as compared to one mentioned in the RREQ packet. The black hole node advertises itself of having shortest path by sending RREP packet with highest sequence number. Then, the source node will start sending the data packets towards the black hole node and the black hole node will drop all the data packets.

A. Types of Black Hole attack in AODV

- **Internal black hole attack:** The black hole node fits itself between the routes of source and destination. It makes itself an active data element. When data transmission is started, it is capable of conducting the packet drop attack. It is called an internal black hole as malicious node itself belongs to the data route.
- **External black hole attack:** this node stays outside the network deny access to network traffic or disrupts the entire network or creates congestion in the network. The external attack is explained as:
 - a. The malicious node detects any active route and note down the destination id.
 - b. The malicious node then sends the RREP packet that includes the destination id field which is spoofed to an unknown destination id. The value of the hop count is set to lowest and the value of sequence number is set to the highest one.
 - c. The malicious node can send the RREP packet to the nearest available node that belongs to the active route or can send directly to the source node if the route is available.
 - d. The nearest available node will relay the received RREP packet through the established reverse route towards source node.
 - e. The source node will update its routing table with new information received from the RREP packet.
 - f. The new route will be selected and source node will send the data via malicious node and the malicious node drops all the data packets that belong to that route.

MULTIPLE BLACK HOLE ATTACK IN MANET

In multiple black hole attack, there are more than one black hole nodes that drop the data packets. In AODV, there is no direct path from source to destination; the nodes cooperate with each other for sending the data packets. The source node broadcasts RREQ packets to all the neighbor nodes for finding the route between source and destination. The intermediate nodes which have the shortest path towards destination sends RREP packet to the source. The sequence number is used to decide the freshness of the route. The highest sequence number refers to the fresh route. The black hole node advertises itself as it has the shortest path from source to destination. When black hole node receives RREQ packet, it sends RREP packet to the source with highest destination sequence number

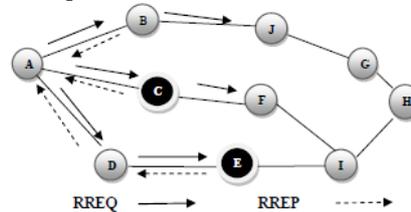


Figure 2: Multiple Black hole attack

In above figure, the nodes C and E are black hole nodes present in the network. Here, both the black hole nodes work individually in order to drop the data packets. If both black hole nodes work together then it is cooperative black hole attack. When the source chooses that spurious route, the black hole node starts to intercept the data packets in its second phase. In this paper, the detection mechanism is proposed for tackling the multiple black hole nodes problem by modifying the AODV protocol.

LITERATURE SURVEY

Hongmei Deng et al., (2002) proposed the method for detecting the single black hole node in MANET. In this method, the intermediate nodes send RREP message along with the next hop information. After getting this information, the source node sends further request to next hop node to verify that it has the route to the intermediate node or not. If the route exists, the intermediate node is trusted and source node will send data packets via that trusted node. If not, the reply message from intermediate node will be discarded and alarm message is broadcasted and isolate the detected node from network. By using this method, the routing overhead and end to end delay will be increased. If the black hole nodes work as a group in an attempt to drop packets, then this method is not efficient.

Mohammad Al-Shurman et al., (2004) proposed the two methods to avoid the black hole attacks. According to the first solution, the source node verifies the validity of the route by finding more than one route to the destination. It waits for RREP packets to arrive from more than two nodes. When the source node receives RREP packets and the routes to destination have shared hops, the source node can then recognize the safe route. This method causes routing delay. The second solution is to store the last packet sent sequence number and the last packet received sequence number in a table. When node receives reply message from another node it checks the last sent and received sequence number. If there is any mismatch, then the ALARM packet is broadcasted which indicates the existence black hole node. Then the other nodes will come to know the existence of black hole nodes in the network. This mechanism is reliable and faster having less overhead.

Latha Tamilselvan et al., (2008)[3] enhanced the AODV protocol by detecting the multiple black hole attacks working in a group. This approach uses the “Fidelity Table” where each node participating is assigned a fidelity level which acts as measurement for the reliability. If the level is 0, then that node is considered to be black hole node and is isolated from the network. The source node receives RREP packet along with its fidelity level and the id of next hop node in the path. The node is considered to be reliable if the average of fidelity levels is above the threshold. Then, the source node selects the path with high fidelity level. The fidelity level of participating nodes is updated. After receiving the data packets, the destination node has to send the acknowledgement to the source. Then, the source node increments the fidelity level of intermediate nodes for their faithfully participation. But if the acknowledgment is not received in some given time, the fidelity level is decremented. All the nodes exchange the fidelity table periodically. As the fidelity level reaches to 0, the node is considered to be malicious one and other nodes will be informed about it.

Payal N. Raj et al., (2009)[6] proposed DPRAODV (detection, prevention and reactive AODV) to prevent the black hole attack by informing the other nodes about the malicious node. If the value of RREP sequence number is found to be higher than the threshold value, then the node is said to be malicious and it adds the node to the black list. As the node detected an anomaly, it broadcast a new control packet, named as ALARM to its neighbors. The ALARM packet contains the black list of malicious node as a parameter, so that the neighboring nodes come to know that RREP packet from the node is to be discarded. The threshold value is the average of the difference of destination sequence number in each time slot between the sequence number in the routing table and the RREP packet. The purposed solution not only detects the black hole

attack, but also it tries to prevent it further, by updating the threshold which reflects the changing environment in real. The detected malicious node is then isolated from the network.

K. Lakshmi et al., (2010)[4] enhances the AODV protocol. In AODV protocol, the destination sequence number is 32-bit integer associated with every route and is used to decide the freshness of a particular route. If the sequence number is largest, the route will be fresh enough. In this method, all the sequence numbers mentioned in RREP packet is stored along with the corresponding node ID in a RR-table (Route Request). Then, if the first destination sequence number in table is much greater than the sequence number of source node. That node will be identified as malicious node and the entry will be immediately removed from the table. The proposed solution also maintains the identity of the malicious node as MN-Id, so that the control messages from that node can be discarded. In addition, there is no need to forward the control messages from that malicious node. Moreover, in order to maintain freshness, the RR-Table is flushed once a route request is chosen from it.

JaydipSen et al., (2011) proposed DRI and Cross Checking Scheme which is used to identify the cooperative black hole nodes. Each node maintains the extra DRI table with two entries 'From' and 'Through', where 1 represents for true and 0 for false. These entries stand for the information on routing data packet from and through the node. In this solution, the Intermediate node replies the next hop information and DRI entry about next hop node along with RREP packet. The source node then checks the reliability of intermediate nodes by using cross checking scheme via alternate paths by using DRI table information. The detection mechanism used in this approach is time consuming. It provides 50 % throughput but increases end to end delay and routing overhead.

N. Chaudhary et al., (2015) proposed the Timer Based scheme in order to detect and isolate the black hole node in mobile adhoc network. This mechanism utilizes the trust value that is defined by each node on its neighbors. Initially, every neighbor node is assigned the maximum trust value and a timer is set with every data packet. The node does not communicate with those neighbor nodes whose trust value is less than the minimum value. A node checks by monitoring the wireless transmission whether have been received by the next hop before the timer is expired. If any node could not listen wireless transmission of the next hop, the trust value of the next hop will be reduced and the other nodes are notified so that they can update their routing tables. As the node's next hop continuously drop the data packets, its trust value is decreased and becomes less than the minimum trust value. The other nodes put such a malicious node id in their blacklist table. With this mechanism, the black hole nodes are removed from the network and packet delivery ratio is improved.

PROPOSED METHODOLOGY

The proposed multiple black hole nodes detection mechanism algorithm:

- The source node broadcasts the fake RREQ packet with its own source sequence number and address in the destination sequence number and destination address in the RREQ packet fields respectively.
- When legitimate nodes receive the fake RREQ packet, it will compare the source sequence number in fake RREQ packet it received with the sequence number of the source described in the table.
- As the source node sends its own sequence number, it will be more obvious that it will be the latest or fresh one. The intermediate node will have the source sequence less than the described in fake RREQ packet. So it will not reply with RREP packet.
- But, if there exist any black hole node in the network then it will reply with the RREP packet and advertises itself as having the shortest path with highest source sequence number.
- The source node will then detect the black hole nodes exist in the network. And then send the ALARM packet having the list of black hole nodes to the rest of the nodes.

A. PSEUDO CODE OF PROPOSED METHOD

```
// Data receiving routine
If(Data received on network layer && data->source == index )
{
if(detection mode == false)
Sendrequest(data->dest)
Else
Sendrequest(index)
}
// recv reply routine
Recvreply()
{
If(blacklist_nodeid ==reply->source)
{
Drop_reply();
}
}
If(detectionmode)
```

```
{  
If(reply->dest_seqno>seqno)  
// Comparison of sequence number  
Blacklist(replysource)  
Sendnotification(blacklisted_nodeid);  
Detectionmode=false;  
}  
Else //existing AODV code  
}  
//Recv notification routine  
Recv_notification()  
{  
Deleteroute(notification->source)  
Blacklist(notification->blacklisted_node)  
}
```

CONCLUSION: Mobile ad-hoc networks are composed of autonomous nodes that are self-managed without any infrastructure. Therefore, nodes can enter and leave the network dynamically. The nodes communicate with each other by passing the packets of message through each other. The ad-hoc network uses some routing protocol for proper transfer of packets from source to destination. In the routing of MANET, some intermediate nodes act maliciously & attack the packets that are delivered through them. One such type attack is black hole attack that absorbs all data packets in the network without moving them to forward. Hence data loss will occur as data packets are not moved to the destination node. In this paper, we provide a secure mechanism to overcome such types of attacks. Simulation will be carried out by using network simulator tool to address the problem of detection & prevention of multiple black hole attack in mobile ad-hoc network.

FUTURE SCOPE

Security issues in MANET are still one of the areas of research. A lot of research has been devoted to the detection and prevention of black hole attack in MANET. The intelligent source based detection mechanism is proposed here to detect the multiple black hole nodes in MANET. After the detection of black hole nodes, the notification of black listed nodes to other nodes increases the network overhead which should be reduced in future. Also, in future we will use a timer under which the detection will be done so that the delay of data packets can be decreased. In cooperative black hole, more than one black node can cooperate with each other in order to drop the data packets. It means black hole nodes work in a group to attack the ad hoc network. Also, there should be a generalized approach that can be networked for other attacks like gray hole, worm hole etc.

ACKNOWLEDGMENT

The authors would like to thank the management for giving us an opportunity to publish the paper. We would like to thank our department members for extending their cooperation and support in completing the paper.

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ADVANCED PATIENT MONITORING SYSTEM

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Abstract: The patient health parameters are changing rapidly due to various reasons. For implementing automated measurements each patient is given a dedicated system and do not work on centralized mode of operation. If a patient is admitted in Intensive Care Unit (ICU) continuous monitoring of health parameters is taken care by the hospital. But consider if a patient is admitted in a normal ward where the advance measurement systems do not exist. In such cases clinicians go to the wards and measure the patient's physiological parameters for every certain intervals of time. During this manual measurement there is a chance of missing the accuracy and the time consumed is also more. The measurement records which are taken by clinicians are then analyzed by the physician as reference of diagnosis.

This work focuses on the development of ARM based system for wireless blood pressure, SPO₂, temperature measurement along with saline flow monitoring. The readings are then sent to Physicians PC (Personal computer) using ZigBee. The system is developed in such a way that patients can use at home who need to be constantly monitored by clinician or family. In critical condition the physician can be called. This method can easily save many lives by providing them quick service. The DS1621 is a temperature sensor which provides 9-bit temperature readings, which indicate the human body temperature. The SPO₂ Sensor Internally has two IR s, Red LED and Light Detector on other side. It is composed of two light emitting diodes (LED) for sensing blood volume and blood oxygen saturation in the finger. To measure the blood pressure an intelligent automatic compression and decompression device with switch button operation is used which can store 60 measurements.

Keywords: ARM, monitoring, Blood Pressure, SPO₂, DS1621 temperature sensor, Zigbee.

1.Introduction

The electronics technology has entered almost in all aspects of day-to-day life, and the medical field is not an exception for that. There is a need for well-equipped hospitals and diagnostic centers as people are becoming more conscious about their health problems. Some of the reasons behind the increasing percentage of the patient's are the life style. The throat cut competition for success has made people to work for more than 10 hours a day. Also the factors like increasing population and pollution has affected day-to-day life.

Today's hospitals are big and covering large areas in building area. They may occupy number of floors in one building. Different wards are situated at different places such as men's ward, women's ward, maternity ward, general ward, special rooms and more importantly ICU's. Doctors need to keep monitoring the entire patient's in these wards continuously, and this requires more number of skilled clinician's and other concerned employees. It's not feasible for the physician's to go to each ward and monitor each patient frequently, say after every half an hour or one hour. Keeping all these aspects in the mind this work is developed, which can be used efficiently to get rid of such problems.

In India many patients are having heart attacks because of high blood pressure and variations in the pulse rate .To give them timely and proper help first the patient's health need to be continuously measured and monitored. The sophisticated monitoring systems are used only when the patient is in critical condition and available in the hospitals in ICU. Also the temperature, pulse rate and saline flow need to be monitored.

This work focuses on implementation of a real time model for monitoring patients. The proposed system is used to monitor the physical parameters like body temperature, SPO₂, blood pressure and saline flow. It helps in monitoring the patient's health with the help of biosensors using arm development board. The patients in the ICU are monitored using various techniques of wired communication. In this system the patient health is continuously monitored and the acquired data is transmitted to a personal computer (PC) using wireless sensor networks. Here zigbee wireless sensor network is used for this purpose. Embedded processor supports by analyzing the input taken from the patient and the results of all the parameters are displayed on personal computer using zigbee technology.

2.Literature survey

According to the census of US bureau in the world health care, the annual expenditure on healthcare will reach US \$ 4 trillion within next 10 years or 20% of the gross on domestic product [1]. Further there will be 5.8% rise in the healthcare expenses .In 2010 spending on health care is 17.6% which will now be increased to 19.8% GDP. An expenditure of US \$ 46.4 trillion is expected [2, 3] on healthcare services by 2020. Healthcare monitoring systems can drastically reduce hospitalization, waiting time, consultation time, burden on medical staff and over on health cost.

Increasing old age population all over the world is a major challenge in the healthcare facilities. There is a drastic increase in the older adult population (above 65 years age) in the past two decades and by 2025, this age group above 65 will rise by 1.2 billion. There is an increasing need for monitoring of patients in hospitals morbidity and mortality [4].Reports indicate

that before the cardiac or a respiratory arrest 84% of the patients are having physiological problems (vital signs) [5]. Nowadays in hospital patient staff ratio is 10:1 so it is very difficult for the clinician to monitor so many patients and record the parameters. It is always better to identify the health problems at an early stage. Due to all these reasons a reliable automated early detection and monitoring of vital signs in hospitals is studied. This research helps to identify such problems and monitor the patient's in hospital ward environment.

3. Proposed Method

The following components are used in this system

i) LPC 2148

LPC2148 has a microcontroller ARM 7, TDMI – S, CPU with high speed flash memory, at a clock rate of 30 KHz and 32-bit accelerator architecture enabled. The 32-bit Thumb mode reduces the code by more than 30%. The main applications are access control and point of sale due to its tiny size and low power consumption.

-It is a tiny LQFP64 package IC with 32 Kb to 512 Kb on chip flash memory. Very less time is taken for full chip erase, which is in 400ms and 1ms to program 256 B.

-The conversion time for one or two 10-bit ADC's is as low as 2.44 μ s per channel.

-Low power RTC with independent power & 32 KHz clock input.

-Multiple serial interfaces like 2UARTS I²C bus (400 Kbs).

-The setting time of 60 MHz CPU clock is 100 μ s.

-Operating voltage range is (3.3V \pm 10%)

-It has two types of instruction sets

1) 32-bit ARM set.

2) 64-bit Thumb set.

-Thumb code provides 65% of code size of ARM and its performance of 160% of an ARM processor.

-The flash memory gives a minimum of 100,000 erase/write cycles & data retention is of 20 years. Each A/D converter is capable of performing more than 400,000, 10-bit samples per sec. It can be used in power down mode and allows dynamic switching between CPU and DMA modes.

-On chip oscillator operates with external crystal in the range of 1 MHz to 25 MHz.

-It supports 2 power modes – Ideal and Power down Mode. The program consumption is nearly zero in power down mode.



Fig.1 LPC214X

ii) Liquid crystal display: A **16x2 LCD** means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data register. The command register stores the command instructions given to the LCD. A command is an instruction given to the LCD to do a predefined task like initializing, clearing its screen, setting the cursor position, controlling display etc. The data register stores the data to be displayed on the LCD. The data is the ASCII value of the character to be displayed on the LCD. The standard is referred to as HD44780U, which refers to the controller chip which receives data from an external source and communicates directly with the LCD.

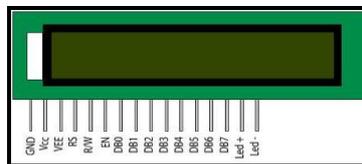


Fig.2 Liquid Crystal Display

iii) ZIGBEE

It is a high level communication protocol using small low power specification based on IEEE standard for WPAN's. It is less expensive, has long battery life, data rate is low with secured networking. It has dual PHY 2.4 GHz & 915 MHz with moderate data rates & used for applications that require less than 0.1% duty cycle which is low. It requires low power & can be used in star, peer to peer, mesh topologies. Its addressing space is 64-bit & has 65,535 network nodes, used for applications that need low latency like sensors. Its range of transmission is 5m – 500m based on environment. PHY provides two services- data service & management service, which interfaces to Physical Layer Management Entity (PLME).



Fig.3 Zigbee

- The high data rate at 2.4 GHz modulation scheme is higher order.
- The layer media access control will allow multiple topologies with no complexity.
- The network layer allows MAC's features to be covered over a large area.
- Zigbee gives a secured relation between network devices along with initiations responding to binding request.

iv) Blood pressure

Blood pressure is the pressure of the blood in the arteries as it is pumped around the body by the heart. When your heart beats, it contracts and pushes blood through the arteries to the rest of your body. This force creates pressure on the arteries. Blood pressure is recorded as the systolic pressure (the beats of the heart) over the diastolic pressure (the relaxation of heart between the beats). The unit which measures this is called Sphygmomanometer.

Monitoring blood pressure at home is important for many people, especially if you have high blood pressure. Blood pressure does not stay the same all the time. It changes to meet your body's needs. It is affected by various factors including body position, breathing or emotional state, exercise and sleep. It is best to measure blood pressure when you are relaxed and sitting or lying down. This physiological parameter gives an early indication to start the treatment. A fall in the BP is a sign prior to cardiac arrest. High blood pressure usually does not have any symptoms, so you need to have your blood pressure checked regularly.

The systolic & diastolic hypertensive readings must be <90 & <60 mmHg. The desired readings of normal blood pressure - systolic (90-119 mmHg) & diastolic (60-79 mmHg).

Hypertensive crisis is ≥ 180 mmHg systolic & ≥ 110 mmHg diastolic. The sensor reading consists of 15 bytes at 9600 baud rate. The output reading is 8-bit value in ASCII format from 000 to 225. The readings can be seen using terminal software.



Fig.4 Blood pressure

Blood Pressure & Pulse reading are shown on display with serial out for external projects of embedded circuit processing and display.

The output reading is 8bit value in ASCII format with fixed digits, from 000 to 255.

129, 107, 095

v) SPO₂

This sensor is useful in making Pulse oximetry, which is a test that measures what proportion of the oxygen-carrying molecules in the blood (called hemoglobin) are actually carrying oxygen. This is known as oxygen saturation or SpO₂. One hundred percent oxygen saturation is attained when all hemoglobin in the blood is completely saturated with oxygen. This simple test does not require a blood sample and is called non-invasive method.



Fig.5.SPO₂

The sensor does not contain any ADC or Analog or Operational amplifier inside.

At 0 % saturation, the absorbance ratio (i.e. comparing how much red light and infrared light is absorbed) will therefore be same as that seen with the deoxy Hb absorbance curve.

At 50 % oxygen saturation, the absorbance pattern is different to when the saturation was 75 %. The ratio of red light and infrared light absorbed is different and the pulse oximeter uses this to calculate the saturation as 50 %.

At 100 % saturation, the absorbance ratio (i.e. comparing how much red light and infrared light is absorbed) will be same as that seen with the oxy Hb absorbance curve.

vi) Digital thermometer

The DS1621 Digital Thermometer and Thermostat provides 9-bit temperature readings, which indicate the temperature of the device. The thermal alarm output, T_{OUT} is active when the temperature of the device exceeds a user-defined temperature T_H. The output remains active until the temperature drops below user defined temperature T_L, allowing any

hysteresis necessary. User-defined temperature settings are stored in nonvolatile memory so parts may be programmed prior to insertion in the system. Temperature settings and temperature readings are all communicated to/from the DS1621 over a simple 2-wire serial interface. Measures temperature from -55°C to +125°C in 0.5°C Increments. Fahrenheit Equivalent is -67°F to 257°F in 0.9°F Increments.

4. Implementation

To practically implement the system, the following aspects should be implemented.

1. Sensing biometric signals: Two types of biological signals are required for processing. They are blood pressure, SPO₂ and temperature. The blood pressure (BP) can be measured using BP sensor, oxygen rate by SPO₂ and temperature is measured by temperature sensor DS 1621.
2. Processing it and taking decisions: Processing of the signals is done by software programmed in the ARM controller. The software is designed in such a way that it detects the exact values of the given variables.
3. Communication: Communication is set up using a transmitter and receiver module with wireless communication protocol.

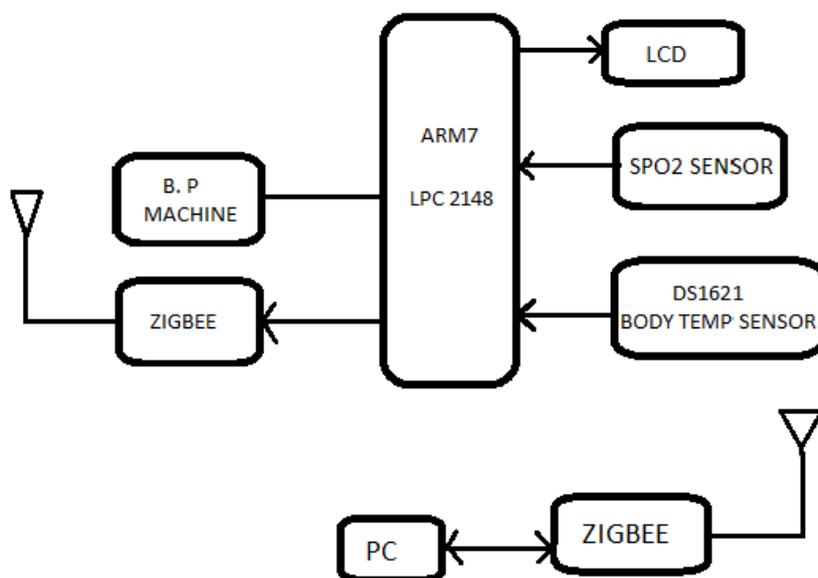


Fig.6 Block diagram

Temperature sensor DS1621 has 4 terminals-VCC, GND (5v), SCL (serial clock), SDA (serial data) .

ARM7 has inbuilt I²C which is activated internally through its registers. After perfect initialization of I²C the data is obtained in to "I²C0DAT" register (1 byte of data) 1 degree centigrade. With the help of conversion formulae, the temperature is converted from degree centigrade to Fahrenheit. The temperature is calculated as

$$\text{Temperature} = \text{TEMP_READ} - 0.25 + (\text{COUNT_PER_C} - \text{COUNT_REMAIN}) / \text{COUNT_PER_C}$$

SPO₂ has 5 terminals-VCC, GND, IR LED, RED LED and OUTPUT ADC Value

* IR LED pin1 is connected to ARM LPC2148

\$ RED LED pin2 is connected to ARM LPC2148

O/P from the SPO₂ sensor circuit is an analog value.

Keeping IR LED pin "ON", read ADC value and store in TEMP1 register(10 millisecond)(ADC0 value).

Keeping RED LED pin "ON", read ADC values and store in TEMP2 register (10 millisecond)(ADC1 value).

(IR/RED)+constant gives SPO₂ %

Blood pressure sensor has 4 terminals-VCC, GND, TRIGGER PULSE,RX. It is a 5v operated device, by applying a trigger pulse i.e 0 (Gnd) given from ARM LPC2148 it will start calculating SYSTOLIC/DIASTOLIC values along with heart beat rate. These Systolic, Diastolic, pulse rate are received serially (TTL levels).

5. Conclusions

The device is designed as wireless and personal equipment. The device can sense the aura of preictal stage few minutes in advance and take necessary action. Hence a technician's assistance is not required for the patient. Therefore this device will be extremely useful for patients who wish to be active in their life. The user gets absolute freedom from wires and can be used when moving. The device is also used as a medical recorder which records the pulse rate, blood pressure and temperature parameters of the human body.

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A PUBLIC AND ASSESSMENT SCHEME WITH DATA DYNAMICS SUPPORT AND FAIRNESS INTERCESSION OF POTENTIAL DISPUTES

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Abstract: Cloud users are not more ponderable to retain their knowledge, well-deserved the way to agreement the perfection of your outsourced dossier emerge as a difficult weary. Lately reminded schemes as an example “deductible documents onion” and “proofs of irretrievability” be ordered to cope with the one in question declare, but they're abase go over unfluctuating extracts figures and for this reason faulty conclusions flow fortify. Furthermore, blackmail models at some point of the above-mentioned schemes basically affect a natural evidence proprietor and focus on coming across a deceptive swarm corporation although clients may get into mischief. This pad proposes a visible investigating draft upon reports change fortify and humanity compromise of wherewithal brawls. Particularly, we tailor a register switcher to get rid of your modification of rule practice in tag guess in modern schemes and get adequate managing of data flux. To deal including the seemliness mystery making sure that no birthday celebration can act up along out having eventual detected, we similarly expand existing menace models and maintain autograph barter design to initiate exhibit compromise protocols, with the intention that anyone can quarrel may well be reasonably established. The freedom separation shows our deal is provably solid, and likewise the display estimation demonstrates the roof of data flow and wrangle decision is reasonable.

Keywords: Integrity auditing, public verifiability, dynamic update, arbitration, fairness.

INTRODUCTION: Data auditing schemes can enable cloud users to determine the integrity of the remotely stored data without installing them in your area that is referred to as block less verification. As users no more physically possess their data and therefore lose direct control of the information, direct employment of traditional cryptographic primitives like hash or file encryption to make sure remote data's integrity can lead to many security loopholes. To begin with, earlier auditing schemes usually require CSP to develop a deterministic proof by being able to access the entire computer file to do integrity check. Next, some auditing schemes provide private verifiability that needs just the data owner that has the nonpublic answer to carry out the auditing task [1]. Thirdly, PDP and PoR plan to audit static data which are rarely updated, so these schemes don't provide data dynamics support. But from the general perspective. However, direct extensions of those static data oriented schemes to aid dynamic update could cause other security threats. Upon each update operation, we allocate a brand new tag index for that operating block increase the mapping between tag indices and block indices. Current research usually assumes a genuine data owner within their security models that have an inborn inclination toward cloud users. To deal with the fairness condition in auditing, we introduce another-party arbitrator into our threat model, that is a professional institute for conflicts arbitration and it is reliable and played by data proprietors and also the CSP. We offer fairness guarantee and dispute arbitration within our plan [2].

CLASSIC DESIGN:

To begin with, earlier auditing schemes usually require CSP to develop a deterministic proof by being able to access the entire computer file to do integrity check. Next, some auditing schemes provide private verifiability that needs just the data owner that has the non-public answer to carry out the auditing task, which might potentially overburden the dog owner because of its limited computation capacity. Thirdly, PDP and PoR plan to audit static data which are rarely updated, so these schemes don't provide data dynamics support. But from the general perspective, data update is a type of requirement of cloud applications. Disadvantages of existing system: Supplying data dynamics support is the most challenging. It is because most existing auditing schemes plan to embed a block's index into its tag computation, which serves to authenticate challenged blocks. However, when we insert or delete a block, block indices of subsequent blocks can change, then tags of those blocks need to be re-computed [3]. This really is unacceptable due to its high computation overhead. Current research usually assumes a genuine data owner within their security models that have an inborn inclination toward cloud users. However, the truth is, not just the cloud, but additionally cloud users, possesses the motive to take part in deceitful behaviors. In Existing System, there are no integrity auditing plans with public verifiability, efficient data dynamics and fair disputes arbitration. Existing system has got the limitation of index usage in tag computation. In Existing System, tag recomputation brought on by block update operations. In Existing System, both clients and also the CSP potentially may misbehave during auditing and knowledge update.

VIBRANT DESIGN:

We address this issue by differentiating between tag index and block index, and depend on a catalog switcher to keep mapping together. Upon each update operation, we allocate a brand new tag index, for that operating block increase the mapping between tag indices and block indices. This type of layer of indirection between block indices and tag indices enforces block authentication and avoids tag re-computation of blocks following the operation position concurrently. Consequently, the efficiency of handling data dynamics is greatly enhanced. In addition and important, inside a public

auditing scenario, an information owner always delegates his auditing tasks to some TPA who's reliable through the owner although not always through the cloud. Our work also adopts the thought of signature exchange to guarantee the metadata correctness and protocol fairness, so we focus on mixing efficient data dynamics support and fair dispute arbitration right into a single auditing plan. To deal with the fairness condition in auditing, we introduce Third-Party Arbitrator (TPAR) into our threat model, that is a professional institute for conflicts arbitration and it is reliable and played by data proprietors and also the CSP. Since a TPA may very well be a delegator from the data owner and isn't always reliable through the CSP, we differentiate between your roles of auditor and arbitrator. Furthermore, we adopt the thought of signature exchange to make sure metadata correctness and supply dispute arbitration, where any conflict about auditing or data update could be fairly arbitrated. Generally, this paper proposes a brand new auditing plan to deal with the issues of information dynamics support, public verifiability and dispute arbitration concurrently. Benefits of suggested system: The suggested system solves the information dynamics condition in auditing by presenting a catalog switcher to help keep a mapping between block indices and tag indices, and get rid of the passive aftereffect of block indices in tag computation without incurring much overhead [4]. The suggested system extend the threat model in current research to supply dispute arbitration, that is of effective significance and functionality for cloud data auditing, because most existing schemes generally assume a genuine data owner within their threat models. The suggested system provides fairness guarantee and dispute arbitration within our plan, which helps to ensure that both data owner and also the cloud cannot misbehave within the auditing process otherwise it is simple for any third-party arbitrator to discover the cheating party. Preliminaries: Cloud users depend around the CSP for data storage and maintenance, plus their access may increase data. To ease their burden, cloud users can delegate auditing tasks towards the TPAU, who periodically performs the auditing and honestly reports the end result to users. The CSP makes gain selling its storage ability to cloud users, so he's the motive to reclaim offered storage by deleting rarely or never utilized data, as well as hides loss of data accidents to keep a status [5]. We extend the threat model in existing public schemes by differentiating between your auditor (TPAU) and also the arbitrator (TPAR) and putting different trust assumptions in it. Our design goal is, Fair dispute arbitration: to permit a 3rd party arbitrator to fairly settle any dispute about proof verification and dynamic update, and discover the cheating party. Our Implementation structure: Our dynamic auditing plan with public verifiability and dispute arbitration includes the next algorithms. Therefore, disputes backward and forward parties are inevitable to some extent. Within our design, we have no additional requirement around the data to become stored on cloud servers. Within our construction, tag indices are utilized in tag computation only, while block indices are utilized to indicate the logical positions of information blocks. In implementation, a worldwide monotonously growing counter may be used to produce a new tag index for every placed or modified block. To be sure the correctness from the index switcher and additional the fairness of dispute arbitration, signatures around the updated index switcher need to be exchanged upon each dynamic operation. However, if parallelization strategy is accustomed to optimize the tag generation and proof verification in the client side, then your access from the index switcher can be a bottleneck of performance. A fundamental truth is that whenever the customer initially uploads his data towards the cloud, the cloud must run the Commitment to determine the validity of outsourced blocks as well as their tags, and later on their signatures around the initial index switcher are exchanged. An easy strategy is to allow the arbitrator(TPAR) make a copy from the index switcher [6]. Furthermore, since the change from the index switcher is because data update operations, the CSP can reconstruct the most recent index switcher as lengthy as necessary update information are delivered to the CSP upon each update, which helps the CSP to determine the client's signature and generate their own signature around the updated index switcher. The safety of the protocol depends on the safety from the signature plan accustomed to sign the index switcher, that's, all parties only has minimal probability to forge a signature signed using the other party's private key. Once the client finds failing of proof verification throughout an auditing, he contacts the TPAR to produce an arbitration. To attain stateless arbitration in the TPAR, throughout an arbitration, all parties needs to send his form of the index switcher towards the TPAR for signature verification. Within our arbitration protocol, all parties must send his signature around the latest metadata to another party. We proceed by including several models of update and signature exchange. Now we evaluate the problem in which the signature exchange cannot be normally finished. To optimize looking here we are at tag indices, we sort the indices of challenged blocks before searching. However, data update and dispute arbitration involve the computation and verification from the signature around the index switcher. In implementation, we write the information from the index switcher right to apply for storage. Thus, computing or verifying the signature around the index switcher must read its content in the file. However in cloud atmosphere, remotely stored data might not simply be read but additionally be updated by users that are a common requirement [7]. To get rid of the index limitation of tag computation in original PDP plan and steer clear of tag recomputation introduced by data dynamics.

CONCLUSION:

The purpose of this paper would be to offer an integrity auditing plan with public verifiability, efficient data dynamics and fair disputes arbitration. To get rid of the limitation of index usage in tag computation and efficiently support data dynamics, we differentiate between block indices and tag indices, and devise a catalog switcher to help keep block-tag index mapping to prevent tag re-computation brought on by block update operations, which incurs limited additional overhead, as proven within our performance evaluation. Meanwhile, since both clients and also the CSP potentially may misbehave during auditing and knowledge update, we extend the present threat model in current research to supply fair arbitration for solving disputes between clients and also the CSP, that is of significant importance to the deployment and

promotion of auditing schemes within the cloud atmosphere. We accomplish this by designing arbitration protocols in line with the concept of exchanging metadata signatures upon each update operation. Our experiments demonstrate the efficiency in our suggested plan, whose overhead for dynamic update and dispute arbitration are reasonable.

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COALA: A PROTOCOL FOR THE AVOIDANCE AND ALLEVIATION OF CONGESTION IN WIRELESS SENSOR NETWORKS

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Abstract:The occurrence of congestion has an extremely deleterious impact on the performance of Wireless Sensor Networks (WSNs). This article presents a novel protocol, named COALA (COngestionALleviation and Avoidance), which aims to act both proactively, in order to avoid the creation of congestion in WSNs, and reactively, so as to mitigate the diffusion of upcoming congestion through alternative path routing. Its operation is based on the utilization of an accumulative cost function, which considers both static and dynamic metrics in order to send data through the paths that are less probable to be congested. COALA is validated through simulation tests, which exhibit its ability to achieve remarkable reduction of loss ratios, transmission delays and energy dissipation. Moreover, the appropriate adjustment of the weighting of the accumulative cost function enables the algorithm to adapt to the performance criteria of individual case scenarios.

Keywords:Wireless Sensor Networks; congestion avoidance; congestion control; load balancing

Introduction

The operation of a WSN is interdependently correlated with the existence of data traffic. Network congestion is one of the most serious problems encountered in the management of the data traffic within a WSN. Congestion occurs when current traffic load exceeds available transmission ability at any point in the network. Congestion has an absolutely detrimental impact on WSN performance [1]. More specifically, congestion procures the overflow of node buffers, the degradation of the overall channel quality, and the increase of both loss rates and transmission delays.

This article proposes a novel protocol that aims, by ruling the routing process, not only to prevent the occurrence of congestion, but also to deter the dispersion of oncoming congestion in WSNs. This protocol performs the discovery of the routing paths that are less likely to be congested, based on the computation of a suitably formulated cost function. This cost function takes into consideration a collection of static and dynamic metrics that are related with congestion.

The remainder of this article is organized as follows. Section 2 outlines various existing protocols for congestion avoidance and in congestion control WSNs. The description of the proposed congestion protocol takes place in Section 3. In Section 4, the performance evaluation of the proposed protocol is performed through the description and analysis of simulation results. Finally, Section 5 concludes the article.

Related Work

Congestion is a phenomenon that comes along either interference in the communication medium, which is caused by the concurrent transmission of many nodes, or buffer overflow, which is caused by the fact that incoming traffic load in a node exceeds its buffer capacity. The confrontation of congestion is the subject of numerous scientific research works [1,2,3,4,5,6,7]. Some of them, introduce *congestion avoidance protocols*, which propose proactive tasks in order to prevent congestion occurrence. These protocols normally involve MAC and network layer operations. Some other research works propose *congestion control protocols* that act reactively to the existence of congestion in order to mitigate it. Protocols of this kind normally involve MAC and network layer operations, and in some cases they also use transport layer actions. Additionally, cross layer interaction between transport and underlying layers is an efficient way of congestion control while MAC layer provides channel status that can be incorporated in congestion control mechanisms [1].

The detection of congestion can be performed by taking into consideration one or a combination of specific performance metrics. The most popular of them are: packet loss, buffer occupancy, delay, packet service time and packet inter-arrival time [2,3].

The notification of congestion occurrence can be either *explicit*, where relative informing messages are sent by congested nodes to other nodes, or *implicit*, where the notifying information is incorporated in data packet headers or in ACK packets that are piggybacked. Explicit notification is unfavorable because it adds substantial traffic load to the already jammed network [4,5].

The mitigation of congestion can be pursued by either traffic control or resource control or a combination of them. When *traffic control* is applied, the quantity of the packets injected into the network is suitably decreased in order to

alleviate both traffic load and congestion. However, traffic control is not efficient in event-based applications where any restriction in the transmission of data is unacceptable. When *resource control* is applied, data packets are routed through alternative paths that are not congested. Yet, in this way extra delays or even routing loops may be caused [6,7].

CODA, proposed by Wan et al. [8], is one of the most well-known protocols, which aims at the achievement of congestion avoidance and control. Its operation is based on flow control. It introduces the idea of a control mechanism by which every node that detects the occurrence of congestion, sends backpressure messages to its data source nodes. Every source node that receives backpressure signals either throttles its sending rates or drops packets based on the local congestion policy adopted. Additionally, source nodes start throttling their sending rates as soon as they do not receive, at predefined time, feedback messages sent to them by sink. Ahmad and Turgut [9] proposed an alternative path routing protocol which uses the ratio of the numbers of downstream to upstream nodes along with the queue sizes of the downstream nodes in order to detect congestion and reallocate traffic through alternate routes. PACA, proposed by Kandris et al. [10], pursues congestion avoidance by circumventing nodes that are either located close to the sink, or have more downstream than upstream neighbors or have very frequent data transmissions. In [11] Sergiou et al. introduce two very promising lightweight schemes for congestion avoidance and control. In the first of them, named DAIPaS Hard, data flows are forced to change their path in order not to congest the receiving node based on a multivariable utility function. In the second of them, named DAIPaS, each node attempts to serve just one flow and if this is unavoidable the DAIPaS Hard algorithm is executed.

Huang et al. proposed TALONet [12], which uses both traffic control and resource control to avoid congestion. Specifically, TALONet combines various levels of transmission power in order to relieve existing congestion in data link layer, along with buffer management to avoid congestion in buffer level, and multi-path routing in order to relay congested traffic flows through alternative paths. HTAP [13], proposed by Sergiou et al., is a scalable protocol aiming to minimize congestion and assure reliable data transmissions in event-based networks through resource control. As soon as congestion occurrence is detected, alternative paths are created and nodes are hierarchically levelled in these paths and exhausted nodes are bypassed in order to achieve load balancing. Kang et al. proposed the TARA protocol [16]. In TARA, as soon as emerging congestion is detected in a node, by measuring both the buffer occupancy and the channel load, this node is considered to be a hot-spot node. Next, traffic is deflected from the hot-spot node through a so-called distributor node along a detour path and reaches the so-called merge node, where the flows are merged. As soon as congestion has been alleviated the network stops using the detour path. Jan et al. introduced PASCCC [17], which is an energy-efficient application specific clustering congestion control protocol. In PASCCC, data packets are prioritized as high priority and low priority packets according to the type of their content. During congestion low priority packets are discarded.

Table 1 enlists in comparison basic characteristics of both the aforementioned protocols and the proposed in this research work protocol.

Protocol	Metric Considered	Congestion Notification	Congestion Mitigation/Avoidance
CODA [7]	Buffer occupancy and channel load	Explicit	Traffic Control
Ahmad and Turgut [8]	Buffer occupancy and characteristic ratio	Implicit	Traffic Control
PACA [9]	Buffer occupancy, characteristic ratio, distance, time of use	Implicit	Resource Control
DAIPaS [10]	Buffer occupancy, channel load, energy	Implicit	Resource Control
TALONet [11]	Buffer occupancy	Implicit	Traffic and Resource Control
HTAP [12]	Buffer occupancy, energy	Implicit	Resource Control
TADR [13]	Buffer occupancy	Implicit	Resource Control
ECODA [14]	Dual buffer threshold and weighted buffer difference	Implicit	Traffic Control
TARA [15]	Buffer occupancy and channel load	Explicit	Resource Control
PASCCC [16]	Buffer occupancy, type of content	Implicit	Traffic Control
COALA	Buffer occupancy, popularity index, energy, distance, vicinity index	Implicit	Resource Control

Proposed Protocol Description

Following the above-mentioned introduction to well-known protocols for the avoidance and or control of congestion in WSNs, COALA (*COngestionALleviation and Avoidance*), which is the proposed in this article protocol of this kind, is introduced in this section.

COALA protocol, operating proactively, uses simple static information of network nodes in order to perform data routing through the paths that are less probable to be congested. In the face of imminent congestion, COALA acting reactively, uses implicit notification of congestion and applies resource control with the intention of preventing the further diffusion of congestion.

Preliminary Considerations and Terms

First, a densely deployed WSN where homogeneous nodes are positioned in a uniformly random way, such as the one illustrated in Figure 1a, is considered to be the reference point for the protocol description. It is assumed that there are one sink. It is also supposed that every individual node knows both its location and the location of the sink.

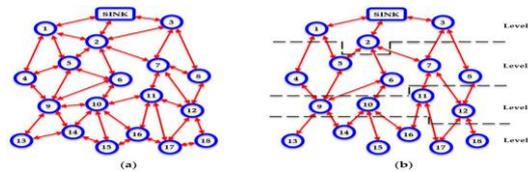


Figure 1. A typical example of a WSN topology in: (a) Initial arrangement of interconnected network nodes; (b) Level-based taxonomy of network nodes.

Additionally, it is assumed that incidents referred here as *events*, are created and all nodes that are located within the range of each event, send related data to the sink. Thus, the number of data sources is variable. Also, all nodes are considered to have the same transmission and sensing range. Moreover, it is supposed that multihop routing through direct neighboring nodes is utilized, whenever the sink is not placed within the transmission range of the node that relays data to the sink. Furthermore, CSMA is considered to be used as the medium access control (MAC) protocol.

For every individual node i :

- the area where the signals sent by node i can reach, is defined as Transmission Range $TR(i)$
- the minimum number of hops for node i in order to reach the sink, is defined as level $L(i)$
- every node j that is placed within $tr(i)$ and has $L(j) = L(i) \pm 1$, is defined as Neighboring Node $NN(i)$
- the ratio of the total number of $NN(i)$ whose level L is greater than $L(i)$ to the total number of $NN(i)$, is defined as Vicinity Index $VI(i)$
- the ratio of the accumulative participation of a node in data flows over time is referred as Popularity Index $PI(i)$
- the so called Availability Index $AI(i)$ expresses either the ability (when having value 1) of the node to relay data or the unavailability (when having value 0) of the node to do so, because the node has either limited buffer space, or limited energy or because its neighboring nodes that have lesser level are blocked

Initialization Phase

The initialization phase of COALA aims to perform all the initial calculations of both the level L and the neighbor table of all networks nodes. These calculations are necessary for the inception of the congestion avoidance algorithm and this is why it is executed only once.

Specifically, this phase is initiated as soon as the sink transmits a “hello” message, which includes the sink ID number along with its level L , which is equal to 0. Next, every node that receives this message, sends back to the sink a corresponding acknowledgement message that includes its ID number. As soon as the sink receives such an acknowledgement message from a node, it sends another message back to this node, which confirms that this node is a neighboring node of the sink and that it is a level 1 node. Every level 1 node initiates its neighbor table, which includes the details of the sink and transmits a “hello” message, which includes its ID number, its level L , which is equal to 1, its position, its current energy, and its current buffer occupancy. Every node that receives this message, sends back to the transmitting node a corresponding acknowledgement message that includes the current values of its neighbor table parameters, which are explained later on. As soon as the level 1 node receives such an acknowledgement message from a node, it sends another message back to this node that includes its updated neighbor table along with a confirmation that this node is its neighboring node. If the new neighboring node has not already acquired a level number, then it is recognized as a next (i.e., 2) level node.

This procedure carries on until every individual node in the network not only has been assigned a corresponding level number, as illustrated in Figure 1b, but also has become aware of its neighbor table. In this way, each node constructs an overall view of the network topology and becomes aware of all the available routing paths towards the sink, avoiding the formation of routing loops.

Steady-State Phase

The steady-state, which is explained in this subsection, begins as soon as the initialization phase is completed. Its operation is mainly based on the utilization of the neighbor tables that, as mentioned above, have been created, during the initialization phase, for all network nodes. A typical neighbor table of a network node contains the current values of the following parameters:

- node ID,
- level number
- position
- energy
- buffer occupancy
- popularity index
- availability index
- vicinity index

The overall data routing process, during the steady-state, is based on the current values of all neighbor tables that are dynamically updated. Specifically, similarly to [11] every network node, which has data to send to the sink, examines its own neighbor table and discovers the candidate recipients among its neighbors who have smaller level number, i.e., its neighbors, which are located at a level closer to the sink, if any.

Therefore, at this point, each node neglects all of its connections with other nodes, which are located either at the same level with itself or at lower levels and focuses at the nodes that are placed at an upper level in the network taxonomy, as shown in Figure 1b.

In the case that there are at least two candidate recipient nodes having $AI = 1$, COALA protocol suggests that the transmitting node must relay its data through the node that has the minimum vicinity index. For instance, referring to Figure 1b, if node 14 has data to send upwards to the sink, then it has two candidate nodes through which it can relay its data, i.e., node 9 and node 10. If these nodes are both available (i.e., have $AI = 1$) then node 9 will be selected, since $VI(9) = 2/5 = 0.4$ and $VI(10) = 3/4 = 0.75$. This is because node 9 may receive data from 2 lower level nodes and transmit data to 3 upper level nodes, while node 10 may receive data from 3 lower level nodes and transmit data to 1 upper level node. Thus, theoretically node 10 is more likely to be congested than node 9 if normalized flow rate patterns are considered. This initial routing criterion enhances the corresponding initial consideration suggested in [11].

This procedure is carried on until the whole routing path has been determined. The selected path information is stored in the header of the data packets transmitted. In this way, every time that a node has data to send to the sink, a dynamically updated spanning tree is created in order to route all data load through the theoretically less probable to be congested shortest path. It is important to notice that this process is based on purely static information, which is well-known as soon as the steady-phase is terminated.

Specifically, the data has to be relayed via an alternative path. For this reason, COALA protocol proposes the utilization of a multivariable cost function that aims to evaluate the overall cost of every neighboring node, by taking into consideration the buffer occupancy, the dissipated energy, the level number, the availability index, the popularity index, the vicinity index and the geographical distance of this node. The mathematical representation of this cost function is defined in (1):

where:

- denotes the accumulative cost of node i
- denotes the normalized buffer occupancy of node i
- denotes the normalized dissipated energy of node i
- denotes the normalized level number of node i
- denotes the normalized vicinity index of node i
- denotes the normalized popularity index of node i
- denotes the normalized geographical distance of node i from the transmitting node
- denotes the availability index of node I are the corresponding weighting factors

The buffer occupancy metric is considered in order to prefer nodes that have more free space in their buffers. The dissipated energy parameter is used so as to avoid the use of nodes that have low energy reserves. The level number is considered in order to give priority to upper level nodes, so that data are routed towards the sink. The vicinity index metric is used in order to avoid the utilization of nodes that have plenty of probable data suppliers and few data recipients. The popularity index is taken into consideration so as to slide over network nodes that tend to be repetitively busy. For instance, nodes that are located either in centric routing paths or within areas with frequent creation of events have high popularity and thus are more probable to get congested. The geographical distance between neighboring nodes is taken under consideration in order to give increased priority to the data relaying via the closest nodes than the more distant ones. The overall sum of products is multiplied by the availability index in order to prevent the utilization of nodes that are unavailable due to either insufficient energy, or inadequate buffer space or even inaccessible upper level neighboring nodes.

Additionally, the existence of the weighting factors in this cost function, aims to support the appropriate adaptation of the algorithm in order to satisfy the different demands of every individual application. For instance, wherever the conservation of energy has major priority, is assigned a greater value. In Figure 2, a descriptive flowchart of COALA protocol is illustrated.

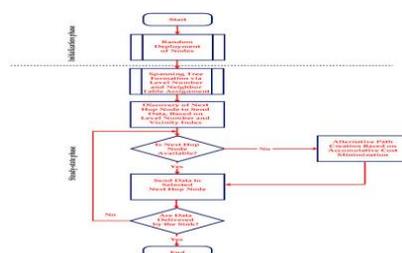


Figure 2. Flowchart of the algorithm of COALA protocol.

Proposed Protocol Evaluation

The proposed congestion avoidance protocol has been validated through the utilization of an appropriately developed, simulation environment. The customized console-based simulation platform was built by using C++ programming language according to the methodologies described in [18,19].

Specifically, multiple runs have been executed in order to investigate the protocol performance in comparison with DAIPaS Hard scheme in various scenarios concerning randomly deployed topologies.

4.1. Simulation Process

The simulation environment creates a number of user defined nodes, randomly positioned in a user defined geographical area of square shape. The node that is created first plays the role of the unique sink. The user defines the minimum node transmission range that enables two nodes have direct communication and thus be considered as neighboring nodes. The software environment assures that for every individual network node there is at least one routing path from this node towards the sink.

In every single simulation test, several different topologies are created. For every topology, a number of simulation runs is applied. During simulation tests, events are created in arbitrary positions and random time instances and each event range, i.e., a cyclical area that surrounds the event position, was supposed to be varying. Each node, located within an event range, is supposed to sense the occurrence of this event and has to transmit corresponding event notifications to the sink. Since multiple nodes may serve the same event, the sink may receive multiple notifications for the same event. Each event notification is accompanied by a corresponding event message header. This event header contains a time stamp that denotes the time of its generation.

As the event range increases from an initial value to a maximum value, the number of the nodes that are located within the area where the specific event takes place increases too. Subsequently the number of the notification data sent to the sink also arises.

The initial energy of every individual node is considered to range between a high and a low limit value, which are user defined. This condition has been set in order to conform to the fact in real WSNs applications the network nodes have different energy reserves. Additionally, the dissimilarity in the energy levels of the sensor nodes allows simulation tests to demonstrate better the ability of COALA protocol to achieve energy efficient performance.

The configuration parameters along with their values are summarized in Table 2.

Parameter	Value
Topology size	1000 m × 1000 m
Number of nodes	100
Number of different topologies	100
Number of simulation runs for the same topology	30
Node transmission range	50 m
Node sensing range	50 m
Node buffer size	10 packets
Initial node energy	1.5 J-2.5 J
Event range	100 m-400 m
Event range increase step	100 m

Table 2. Simulation Parameters.

Presentation and Appraisal of Simulation Results

The first set of simulation tests performed, evaluate how the increase in the rate of data transmission influences the average time it takes for an event notification, sent by a network node that senses the specific event, to reach the sink. The corresponding simulation results are illustrated in Figure 3. In these tests, all weighting factors are considered to be equal to 1.

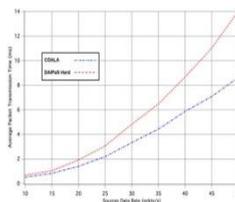


Figure 3. Average Packet Transmission Time vs. Traffic Load Rate.

As it can be seen in Figure 3, in COALA protocol the average packet transmission time not only is less than that in DAIPaS Hard, but it is also more robust against the gradual growth of data transmission rate.

Next, the performance of COALA protocol is investigated relatively with how the data transmission is affected by the progressive rise of the of data traffic. This correlation is depicted in Figure 4 and Figure 5, through the graphical representation of the overall number of the data packets received and the percentage of the data packets lost respectively.

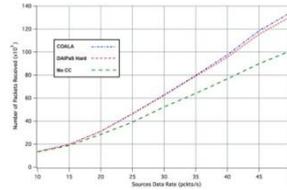


Figure 4. Number of Packets Received vs. Traffic Load Rate.

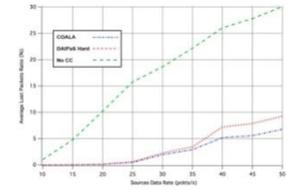


Figure 5. Average Lost Packets Ratio vs. Traffic Load Rate.

The examination of both Figure 4 and Figure 5 makes evident that COALA protocol not only achieves lower data losses but also resists more against the progressive increase of the traffic load.

The next performance metric evaluated is the overall energy consumption of the network. Figure 6, illustrates in what way the rise of traffic load increases the network energy dissipation.

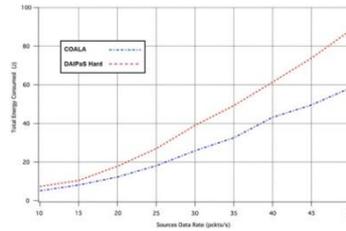


Figure 6. Network Energy Dissipation vs. Traffic Load Rate.

The examination of Figure 6 demonstrates that COALA protocol outperforms DAIPaS Hard in energy efficiency increasingly as the traffic load raises.

Finally, a set of simulation tests were performed in order to examine how the variation of the weighting factors of the accumulated cost of nodes deviates the results of COALA protocol utilization. As an example, the way by which the variation of two weighting factors, i.e., and influences the average packet transmission time and the number of lost packages was investigated.

Specifically, the influence of the variation in the two aforementioned metrics is depicted in Figure 7 and Figure 8 correspondingly.

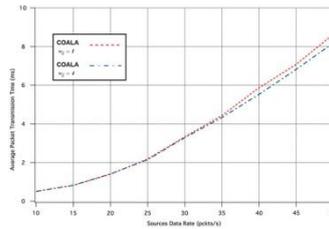


Figure 7. Average Packet Transmission Time vs. Traffic Load Rate for variable .

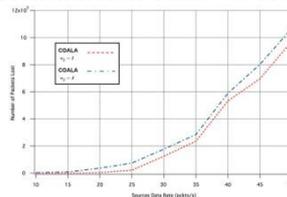


Figure 8. Number of Packets Lost vs. Traffic Load Rate for variable .

The increase of makes the distance criterion have key priority within the accumulated cost function. The examination of Figure 7 and Figure 8 validates that this increase accelerates the data transmission but deteriorates its quality. This is because data are preferred to be relayed through the closest neighboring nodes although these nodes may have more traffic load than other more distant neighbors. Similarly, the influence of the variation in the two aforementioned metrics is depicted in Figure 9 and Figure 10 correspondingly.

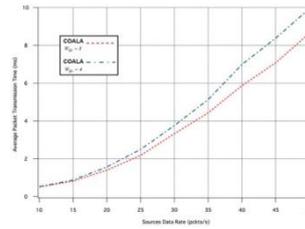


Figure 9. Average Packet Transmission Time vs. Traffic Load Rate for variable

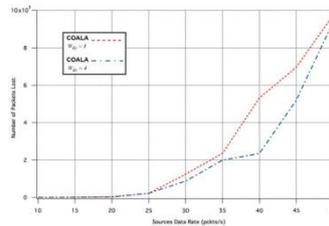


Figure 10. Number of Packets Lost vs. Traffic Load Rate for variable .

The increase of makes the buffer occupancy criterion have primary priority within the accumulated cost function. The examination of Figure 9 and Figure 10 confirms that this increase improves the reliability of the data transmission at the expense of the throughput. This is because data are preferred to be relayed through nodes that have less traffic load although this may involve longer paths.

Conclusions

In this research article, a novel lightweight scheme named COALA, which aims at preventing the diffusion of imminent congestion in WSNs through alternative path routing was introduced. The innovation of this proposed scheme lies in the fact that it takes into consideration a certain number of both invariant and variable factors that affect the probability of congestion occurrence along with other crucial factors like energy efficiency.

The efficacy of COALA protocol was evaluated through simulation tests in comparison with an advanced scheme of this kind, named DAIPaS Hard. The first comparative advantage of COALA is that it incorporates the use of the so-called vicinity index during the initial determination of routing paths, which makes nodes having a lot of possible data receivers and few data providers be favored. Therefore, traffic load may be distributed in a more balanced manner. Additionally, COALA introduces a multivariable cost function, which takes into consideration not only the metrics that DAIPaS Hard suggests, but also the popularity index, the vicinity index and the geographical distance of this node. Thus, congestion caused due to upper-level neighboring nodes that are repetitively busy, or have many probable data suppliers and few data recipients or are located at more distant locations, can be avoided. As a result, COALA achieves the reduction of transmission delays, lost packets rates, and energy dissipation.

Additionally, it was shown that the simple yet effective algorithm of COALA is able to accommodate to the performance criteria of each individual application through the appropriate adjustment of the weighting of its main cost function.

The authors of this article intend in future research work to enhance the herein-proposed protocol by either incorporating criteria based on well-known algorithms for energy efficiency [20,21,22], QoS [23] and security [24]. The convergence with game theoretic approaches [25], and the adaption of the proposed algorithm to standards for IPv6 routing in LLNs [26] are also under consideration.

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A STUDY ON RECENT APPROACHES IN BIOSENSORS FOR DETECTION OF WATER DEFILEMENT

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ABSTRACT

Water safety is a global health goal and the water borne diseases are a major crisis on health. Therefore, detection of microbial pathogens and different contaminants in water is the solution to the prevention and recognition of problems related to health and safety. Biosensors are being widely used for the detection of various contaminants in water. A biosensor is a self-contained integrated device capable of providing specific quantitative analytical information using a biological-recognition element, which is retained in direct contact with a transduction element. This paper summarizes recent advances made in detection and quantification of waterborne contaminants with different types of biosensors that offers capabilities for rapid, miniaturized on-line and in-situ analysis with minimal waste production.

Keywords: Biosensors, environmental monitoring, water pollutant, heavy metal.

1. Introduction

Pollution is one of the major issues of today's world. So there is an increasing need for effective tools to estimate the risks derived from the large number of pollutants released to the environment. Environmental toxicology is the qualitative and quantitative study of the adverse effects of anthropogenic and naturally occurring stressors. Initial aquatic ecotoxicology studies were based on acute toxicity measurements of vertebrates. However, these methods suffer some standardization problems, are expensive, time-consuming, and moreover, are associated with ethical problems. Hence, new technologies for aquatic ecotoxicological studies were launched. Biological tools like biosensors provide us with detection systems for signaling a potential damage in the environment. Early recognition will prevent eventual damage to environmental matrices. Ideally, early warning signals in ecosystems using sensing systems would not only tell us the initial levels of damage, but these signals will also provide us with answers for the development of control strategies and precautionary measures. Biosensors are mostly designed for routine analysis such as quality control. The development of these biosensors is a multidisciplinary effort. The impact of these biosensors is likely to be wide-ranging. Biosensors helps in detecting emerging contaminants like pharmaceuticals, personal care products (PPCPs), steroids, xenoestrogens and other endocrine disrupting compounds (EDCs), algal toxins, giardia (and other pathogens) and a variety of miscellaneous chemicals such as caffeine, cholesterol, etc (Rodriguez-Mozaz et al., 2007). The objectives of this paper are to discuss the recent advances made in detection and quantification of waterborne contaminants with different types of biosensors.

1.1. Definition

A biosensor is an analytical device, which converts a biological response into an electrical signal. It consists of two main components: a bio-receptor or bio-recognition element, which recognizes the target analyte and a transducer, for converting the recognition event into a measurable electrical signal. The bio receptor recognizes the target analyte and the corresponding biological responses are then converted into equivalent electrical signals by the transducer. The amplifier in the biosensor responds to the small input signal from the transducer and delivers a large output signal that contains the essential waveform features of an input signal. The amplified signal is then processed by the signal processor where it can later be stored, displayed and analyzed.

1.2 Biosensors with biological effect-based analysis

Biosensors techniques utilizing enzymes, natural receptors, bacteria or cells can be used to rapidly identify toxicity and other biological effects in water containing different chemicals known as biosensing. The determination of toxicity provides an integrated picture of the overall impact on the environment. Research has been carried out where detection of arsenic is signaled as an easily detectable drop in pH and the chromogenic system. The endospores used can be stored and distributed in dried form without requiring freeze-drying or refrigeration (Joshia et al., 2008). Whole organisms can also be used to measure the potential biological impact of a water or soil sample. Sensors for other areas of ecotoxicology, such as genotoxicity and mutagenicity, have also been developed and have been described as "biosensors for environmental stresses". Genotoxicity is associated with different compounds, such as phenols, chlorophenols, PCBs and PAHs, and can constitute an early warning screening parameter for possible cancer-inducing pollution activity. Mammalian cells, which are more complex than bacteria, can give a more sensitive response when compared to bacteria. In the particular case of pharmaceuticals, their environmental presence triggered a proposal to include an environmental risk assessment in the registration procedure for medical products. An ecotoxicological test battery has been designed for that.

1.3 Characteristics of biosensor

Biosensors offer sensitivity at small sample volumes and require minimal sample preparation. A large number of biosensors are available varying in biorecognition principle and/or transduction element. Direct sampling and analysis is possible, giving way to automation. By using specific biological recognition element, a compound can be selectively detected. Also, faster analysis and real-time detection can be done with minimal and non-contaminating waste. Biosensors help in determination of bio available pollutant content and toxicity testing. Availability of portable biosensor systems has

enhanced applicability to early-warning and on-site monitoring. Biosensors are user friendly cost-effective equipment that can be used by non qualified personnel as well.

Biosensors should be distinguished from bioassays or bio analytical systems, which require additional processing steps, such as reagent addition and where the assay design is permanently fixed in the construction of the device. Biosensors are relatively cheap and fast, which make them ideally suited for routine testing and screening of samples. Biosensors have demonstrated a great potential in the past as analytical tools and avoids in many cases sample pre-treatment or with minimal sample preparation and even allowing on-site field monitoring.

2. Classification

On the basis of the bio-recognition principle, biosensors are classified into various categories. A bio receptor can be a tissue, micro organism, organelle, cell, enzyme, antibody, nucleic acid and bio mimic etc. and the transduction may be optical, electrochemical, thermometric, piezoelectric, magnetic and micromechanical or combinations of one or more of the above techniques. Some of them will be reviewed in this section.

2.1. Plant and animal tissue based biosensor

Biocatalysts, such as specialized tissues from higher animals and plants, have been incorporated into various electrochemical transducers to construct biosensors for the detection of important analytes including drugs, hormones, toxicants, neurotransmitters and amino acids. Nerve cells in animals and phloem cells in plants share one fundamental similarity that they possess excitable membranes through which electrical excitations can propagate in the form of action potentials. It is conceivable that action potentials are the mediators for intercellular and intracellular communication in response to environmental irritants. Plants quickly respond to changes. Once initiated, electrical impulses can propagate to adjacent excitable cells. The change in transmembrane potential creates a wave of depolarization or action potential, affecting the adjoining resting membrane. Most plant tissue-based biosensors are based on electrochemical detection, usually amperometric or potentiometric. However, optical techniques, such as chemiluminescence or fluorescence, have recently appeared providing higher sensitivities and faster response times.

Work has been done on primary-source freshwater drinking samples from the Clinch and Tennessee Rivers using tissue based detection system that uses naturally occurring aquatic photosynthetic tissue as the sensing material for detection of chemical antagonists in the water. Sensor readout is based on well-known principles of fluorescence induction by living photosynthetic tissue. They successfully detected algae in every sample and readily monitored changes in the characteristic fluorescence induction curves when the samples were exposed to various pollutants. The unique aspect of this approach to real-time water quality monitoring is that unlike conventional sensing devices, this sensor material is external to the detecting instrument and is continuously refreshed (Rodriguez Jr et al., 2002). Another invention done on water quality sensors for detecting the presence of at least one chemical or biological warfare agent includes: a cell; apparatus for introducing water into the cell and discharging water from the cell adapted for analyzing photosynthetic activity of naturally occurring, free-living, indigenous photosynthetic organisms in water (Greenbaum et al., 2003).

Another work has been done in which a kinetic model was developed to describe the processes of herbicide diffusion into plant tissues and binding to the active sites. DCMU [3-(3,4-dichlorophenyl)-1,1-dimethylurea], a commonly used herbicide, was used as a test chemical and its diffusion into plant leaves and binding to plastoquinone B (Q(B)) sites were analyzed by using the model (Guo et al., 2010).

The main advantages of using plant tissues in biosensors are high stability, high level of activity, long lifetime, high reproducibility of the experimental results, availability, cheaper price, less time consumption and its diversity. However, they suffer from low specificity, due to the presence in the tissue of enzymes others than the one of interest, and long response times, due to the diffusion barrier (Campàs et al., 2008).

2.2. Microbial whole cell based biosensor

Whole cells can be used as biosensors if they have transducer property along with the bio receptor element. Generally, cells capable of sensing are modified to incorporate the transducer capacity. Certain parameter such as bioavailability, toxicity and genotoxicity can be assayed using whole cells only. They provide estimation for pollutant bioavailability. The use of whole cells as biocatalysts has several advantages as compared to isolated enzymes, the most important being increased stability and protection from interfering substances. Consequently, microbial biosensors are preferred for measurements in contaminated samples. Whole cell bioassays can be classified as turn off assay- degree of inhibition of a cellular activity that is continuous; or turn on assay – activation of a certain process by the target pollutant. Table 1 includes few studies regarding the use of microbes as biosensors.

2.3. Antibody and enzyme

In surface, ground, or drinking water other than regular pollutants, hormones, pesticides, endocrine disrupting compounds (EDCs) and antibiotics are also found to have an adverse and toxic effect on humans at low nanogram per litre levels. The first issue related to EDCs is removal of steroids from wastewater treatment process. In spite of several reported cases, EDCs did not draw much attention, because of the trace level concentration of detected EDCs and the lack of information on their significance in toxicity. EDCs are known as a class of chemicals which have xenobiotic and exogenous origins while mimicking or inhibiting the natural action of the endocrine system in animals and human, such as synthesis,

secretion, transport, and binding.

One of the effective methods to determine EDCs is usage of biologically based assays. The biological methods are intended to measure the levels of individual EDCs, based on the assumption that the target compound has been identified as an EDC and much is known about its chemical properties. However, traditional toxicity tests may not always be suitable for certain water samples. Several mechanisms are involved in the biological assays to determine EDCs, such as cell proliferation, ligand binding, luciferase induction, vitellogenin induction, or antigen–antibody interactions (Chang et al., 2009).

Cell proliferation utilizes the estimation for cell growth and reproduction in different samples. Ligand binding quantifies the number of specific estrogens binding sites. Luciferase induction measures the amount of luciferase induced from estrogens receptors and response elements with luminescence after cell lysing and the addition of luciferin. They maintain the homeostasis, reproduction, metabolism, development, and/or behavior of living species. Vitellogenin induction quantifies the amount of vitellogenin in the plasma of female fish liver after extraction, which is secreted as a response to estrogens. In addition, the production of vitellogenin in male fish can be seen as an indication of endocrine disruption. Biologically based assays may be applied with whole organisms, cellular, or non-cellular materials, such as antibodies or estrogens receptors. Along with bioassay, immunoassay have become an important tool as automated immunosensor which is based on the principle of total internal reflection fluorescence (TIRFs) and antigen-antibody non covalent binding interaction, that can measure several organic compounds (antibiotics, hormones, pharmaceuticals, EDCs, pesticides) in parallel. Thereafter, the TIRF-based biosensor setup was used to determine the steroidal hormone testosterone (Tschmelak et al., 2005) and estrogens (Tschmelak et al., 2004) at real world samples without sample pre-treatment or sample pre-concentration.

2.4. Nucleic acid based biosensor

Nucleic acid-based biosensors are finding increasing use for the detection of environmental pollution and toxicity. A nucleic acid-based biosensor employs as the sensing element an oligonucleotide, with a known sequence of bases, or a complex structure of DNA or RNA. Nucleic acid biosensors can be used to detect DNA/RNA fragments or either biological or chemical species. In the first application, DNA/RNA is the analyte and it is detected through the hybridization reaction (this kind of biosensor is also called a genosensor). In the second application, DNA/RNA plays the role of the receptor of specific biological and/or chemical species, such as target proteins, pollutants or drugs (Palchetti et al., 2008). New trends in nucleic acid research include development of aptamers and aptazymes as affinity ligands and potential coupling to transduction technologies (Mascini et al., 2005). Deoxyribonucleic acid (DNA) biosensors (genosensors) have been exploited for their inherent physico-chemical stability and suitability to discriminate different organism strains. The main principle of detection among genosensors relies on specific DNA hybridization, directly on the surface of a physical transducer (Teles et al., 2008). Surface plasmon resonance and piezoelectric sensing are reported as transduction principles for DNA-based devices (Minunni, 2003). DNA also showed the possibility of detection of the *E. coli* O157:H7 EDL933 species by using 20-mers (5'- TAATATCGGTTGCGGAGGTG-3') sequence of Gene (Bahsi et al., 2009).

Genus *Mytilus* are intertidal filter-feeders commonly used as biosensors of coastal pollution. Mussels adjust their functions to ordinary environmental changes, e.g. temperature fluctuations and emersion-related hypoxia, and react to various contaminants, accumulated from the surrounding water and define a potential health risk for sea-food consumers. Despite the increasing use of mussels in environmental monitoring, their genome and gene functions are largely unexplored. The transcriptional footprints and discriminating capacity of different mussel tissues have to be taken into account in the microarray analysis.

In the digestive gland, numerous gene probes (101) discriminated biologically relevant doses of two contaminant mixtures and about half of them appear potential markers of real exposure to heavy metals and persistent organic pollutants (Venier et al., 2006). Moreover, among nucleic acids, aptamers represent a new promising recognition element for biosensor development. Recent understanding of the structure–function of nucleic acids, specifically RNA, has opened new perspective in the development of new analytical and diagnostic methods. The coliform *Escherichia coli* were used as a model fecal indicator. DNA probe-coated magnetic beads in combination with the electrochemical monitoring of the oxidation state of guanine nucleotides should allow for direct detection of bacterial RNA (LaGier et al., 2005). In vitro evolution from random sequence libraries makes it possible to build nucleic acids that specifically recognise and bind to virtually any kind of target, such as ions, metabolites, drugs, toxins, peptides and proteins.

The quickly growing area of genomics, ribonomics, proteomics and metabolomics requires the development of high-throughput and massive-parallel analysis of biological samples. In this regard, biosensor technology coupled to nucleic acids could represent a successful approach to the functional genomic area. DNA sensors are being used to detect salmonella enteric using keypad user interface to operate a nucleic acid sensor with fluid handling and real-time polymerase chain reaction (PCR) capabilities. The progress of the Human Genome Project has generated substantial interest in the use of nucleic acid hybridisation technologies to detect and identify organisms and mutations. Biosensors

and micro-array chips that are based on detection of hybridization/interaction of short strands of nucleic acids offer platforms for applications such as screening of genomes, detection of pathogenic organisms, and efficient searching of compound libraries for detection of potential therapeutic agents.

3. Conclusion

Biosensors for potential environmental applications continue to show advances in areas such as detection of heavy metals, biocides, pollutants, microorganisms and various polyaromatic compounds. Also, water toxicity testing, mutagen analysis and BOD estimation is facilitated by use of biosensors. The use of genetically modified AChE in biosensors has significantly increased their sensitivity to inhibition by OP pesticides. Furthermore, genetic modification shows the potential for selection of enzyme variants that are specific for a range of individual compounds. Recently, genetically engineered microorganisms based on fusing of the lux, gfp or lacZ gene reporters to an inducible gene promoter have been widely applied to assay toxicity and bioavailability. Novel gene fusions have been constructed that maybe used to detect response against a wide range of physical and chemical stressors.

One of the major challenges for this area will be the development of environmental applications related to ecosystem and human exposure to genotoxins. Biosensor techniques for potential environmental applications have continued to show sustained advances in a wide range of areas. It is also likely that these advances will play an important role in the development of biosensor systems for the environmental market. Nevertheless, until biosensors achieve operational characteristics similar to the simple pH electrode in terms of durability, sensitivity, selectivity, extended concentration range, achievable response time and resistance to fouling, they will continue to experience significant obstacles to widespread acceptance and use for environmental monitoring. We believe, with current advances in biosensor and progress in modern biotechnology, biosensors will have a promising and bright future.

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CUSTOMIZED CLUSTER 3.0 FOR LUNG CANCER GENES OF HUMAN AND MOUSE

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Abstract-Phylogenetic trees epitomizes the progression relationship among biological genes and organisms. The construction of phylogenetic trees erects on the similarities or dissimilarity of their inherited or physical features. Assume dawn of constructing phylogenetic trees is mainly focused on the substantial characteristics. The present appropriation of high-throughput knowledge has advanced to buildup of large quantity of biological data, which in turn enhance the approach of biological studies in a blend of approaches. This work is mainly focused on the constructing of phylogenetic tree for Lung cancer genes of Mouse based on clinical experimental values. Study of constructing the phylogenetic tree by applying the cluster and by using Java Tree viewer approaches on several genes data differential expressed. The intended results are not obtained, so customization of the tool CLUSTER 3.0 is finished. These results obtained shows the accurate evolutionary relationship between the Lung cancer genes biological datasets proved that same with Human lung cancer genes.

Keywords-Cancer, Cluster, Lungs, Oncogenes, Proteins

I. INTRODUCTION

A phylogenetic tree is a realistic demonstration of the complete connections of genes, and the phylogenetic trees preserve surrounded by the species replicate the similarities of evolutionary relationships. Standard construction of phylogenetic trees were essentially based on physical similarities and dissimilarities. Tough, the method of the deepness has been changed as the production of large quantities of biological data. For example, high-through put sequencing expertise have generated genome sequences in more thousand organisms. Basically the genomic sequence is combination of four unlike kinds of nucleotides (A, C, G and T), with the length emerging from hundreds of thousands to millions. Mainly it has been time-honored that the genomic sequences are extremely analogous for evolutionary closed organisms, but not same for evolutionary apart organisms. So, genomic sequences have been generally used for constructing phylogenetic trees.

The constructing of phylogenetic trees by means of genomic sequences does have a finite number of issues. The genomic sequences are normally lengthy so evaluation genomic sequences from end to end species for erecting phylogenetic trees is computationally pricy. On the other side, living organisms in a small position frequently swap over their genetic materials, also legendary as straight gene transfer, making it harder to arrange evolutionary relationships based on genomic sequences only. Moreover, present genomic sequence resemblance measurement cannot truly expose evolutionary relationships transversely the species. So, it is enhanced to use other data and methods to report right relationships.

Lung cancer is the well-known cause of cancer deaths in men and women in the US [1]. Epidemiological and laboratory animal model educations have proved that smoking and environmental coverage to carcinogens are nearly paired to enlarge lung cancer risk [1–5]. In spite of all people who had smoked are currently past smokers and most of the people are not able to halt smoking. For these reasons, chemoprevention is probably key approach to decrease the more number of tobacco-caused cancer deaths, particularly for prior smokers. The A/J mouse lung tumor model, mainly adenomas, is popularly used preclinical model for lung cancer chemoprevention analysis [3, 6]. Along with the similarity adenomas/adenocarcinomas regularly seen in mice and human lung adenocarcinomas, genetic changes originate in mouse lung tumors also simulate in humans [3, 6]. Among the more than 50 diverse agents tested, several groups of chemicals have shown important efficacy against mouse lung tumor development including glucocorticoids, green tea, nonsteroidal anti-inflammatory drugs (NSAIDs), is thiocyanates, and farnesyl transferase inhibitors [3].

Genetic alterations found in mouse lung tumors contain mutational activation of the K-ras gene, which is perceived in 80% of both spontaneously happening and chemically inputted adenomas and adenocarcinomas of the mouse lung [3,7]. Mutation of K-ras is an initial event in mouse lung tumorigenesis and persists into malignancy [3,7]. Abnormal explanation of added oncogenes or tumor suppressor genes, Ex., c-myc, Rb, and p16 genes, has also been showed in mouse lung tumorigenesis [8]. Allelic removal on different chromosomes indicate the participation of adornment of common and uncommon genes throughout mouse lung tumorigenesis. Allelic loss of the p16 tumor suppressor gene occurs in about 50% of mouse lung adenocarcinomas [9]. Allelic of chromosomes 1, 4, 11, 12, and 14 are frequently associated with

mouse lung tumor development [9–11]. Newly, mouse lung tumor susceptibility loci have been linked to chromosomes 6, 9, 17, and 19. Those linked to lung tumor resistance have been linked to chromosomes 4, 11, 12, and 18 [3]. Detection of mutations or LOH in specific oncogenes and tumor suppressor genes has been the focus in examining for genetic alterations in tumors. Many global measures have newly implemented. These include CGH analysis, which allows one to examine for gene removal or amplification, and proteomics, which permits to develop of protein levels. The advantage of cDNA microarrays to find change gene assessment in the process of neoplastic process which has produced the large quantity of struggle till date. In specific, high-density oligonucleotide arrays and high density cDNA glass slide arrays have been broadly used in profiling gene description in human and cavy tumor tissues.

A. Description of Lung Cancer genes data set:

S.No.	Gene	Normal	Tumour
1	mRNA for translational controlled 40 -kDa polypeptide p40	0.732	1.548
2	Homo putative transcription factor CA150	0.046	0.194
3	45S pre -rRNA	23.31	79.67
4	mRNA for cysteinyl -tRNA synthetase	0.017	0.071
5	mRNA for pancortin - 1 and - 3	0.014	0.036
6	Serine hydrolase - like (Serhl) Mrna	0.025	0.065
7	Human hypothetical protein FLJ11240	0.026	0.057
8	Gene for fibrinogen A-a- chain	0.040	0.179
9	mRNA for erk - 1	0.286	0.566
10	JAK- 1 protein	0.029	0.153
11	Neuronal guanine nucleotide exchange factor	0.016	0.075
12	Zinc finger protein 96 (Zfp96) mRNA	0.020	0.098
13	BALB/ c conserved CHUK mRNA	0.209	0.431
14	mRNA for a- adaptin (C)	0.077	0.264
15	T- cell transcription factor NFAT1 isoform A mRNA	0.034	0.101
16	MCH class I heavy - chain precursor (H- 2D(k)) mRNA	2.691	7.093
17	MCH class I heavy - chain precursor (H- 2K(k)) mRNA	0.275	1.122
18	Complement component C3 gene, 5'end	0.141	0.887
19	10 -Day - old male pancreas cDNA	0.506	0.443
20	11 -Day embryo cDNA	0.41	0.546
21	13 -Day embryo liver cDNA	1.72	1.227
22	α - Globin mRNA	0.011	0.355
23	β - Globin major gene	0.186	0.602
24	CA IV gene	0.007	0.006
25	ALDH II mRNA	0.076	0.063
26	Growth factor - inducible immediate - early gene, cyr61	0.093	0.018
27	Paroxanase (PON- 1) mRNA	0.093	0.027
28	Homo sapiens glucose - regulated protein	0.012	0.07
29	Hybridoma 12A1 immunoglobulin heavy - chain mRNA	0.131	0.026
30	Rat Ras GTPase -activating protein	0.03	0.013
31	H. sapiens TNFa- stimulated ABC protein	0.073	0.063
32	Mitochondrial DNA	0.592	0.241
33	Rat mRNA for ribosomal protein L18a	0.056	0.041
34	Lsp - s mRNA for lysozyme P	0.122	0.116
35	CC10 protein	1.122	0.413
36	Mitochondrial genes for transfer RNA	6.237	4.441
37	Mouse surfactant protein -A (SP-A)	0.079	0.118
38	Rat mRNA for surfactant protein -B	0.401	0.661
39	Pulmonary surfactant protein SP-C	0.014	0.106
40	mRNA for sulfated glycoprotein	0.022	0.062
41	Serine proteinase inhibitor 6 (SPI6)	0.072	0.37
42	a- 1 Protease inhibitor 2 mRNA	0.013	0.037
43	Human mRNA for KIAA0183	0.018	0.082
44	Human mRNA for KIAA0187	0.028	0.391
45	Homolog of D. melanogaster flightless I	0.082	0.492
46	CYP2C40	0.006	0.065
47	RIKEN cDNA 2500002L14 gene	3.322	1.26
48	RIKEN cDNA 5730403B10 gene	4.768	1.693

49	Brain cDNA, clone MNCb- 5704	10.66	3.399
50	Adult male testis cDNA	5.731	2.643
51	0 -Day neonate skin cDNA	6.623	2.317
52	10 -Day embryo cDNA	0.127	0.043
53	Mus musculus proline 4 - hydrosylase a- 1 polypeptide (P4ha1)	0.575	0.183
54	M. musculus similar to KIAA1711	0.379	0.055
55	Mouse DNA sequence from clone RP23- 39409 on chromosome 11	0.379	0.046
56	M. musculus hypothetical protein MGC25836	0.254	0.13
57	H. sapiens chromosome 18, clone RP11-749G1	0.363	0.047
58	LRG1#	0.252	0.121
59	LRG2#	2.268	1.09
60	LRG3#	8.239	3.228
61	LRG4#	0.932	0.474
62	LRG5#	6.114	3.16
63	LRG6#	8.576	2.903
64	LRG7#	46.64	17.38

Table 1: Gene names and its clinical experimental values

III RESULTS

A. HIERARICHICAL CLUSTERING

The Hierarchical Clustering button allows to calculate hierarchical clustering on the inputted data. This is a powerful and helpful method for analyzing all sorts of huge genomic datasets. Cluster at present calculates four types of binary, agglomerative, hierarchical clustering. The core idea is to group a set of elements (genes) into a phylogenetic tree, where elements are pooled by very short branches if they are very similar to one other, and by increasingly longer branches as their likeness decreases. The primary step in hierarchical clustering is to find the distance matrix between the gene expression data. After matrix distances is calculated then, the clustering begins. Agglomerative hierarchical processing involves of repeated cycles where the two nearing remaining elements (smallest distance) are pooled by a branch of a tree, with the length of the branch set to the distance between the pooled elements. The two pooled elements are deleted from list of elements being processed and replaced by an element that represents the new branch. The distances between this new element and all other remaining elements are calculated, and the process is continued until an element reserved.

1. Centroid Linkage Clustering

If Centroid Linkage Clustering button is clicked, a vector is assigned to every pseudo-element, and this vector is used to compute the distances between this pseudo-element and all remaining elements or pseudo-elements using the same similarity metric as was used to calculate the initial similarity matrix. The vector is the average of the vectors of all original elements (Example genes) contained within the pseudo-element. Thus, when a new branch of the tree is made combining group a branch with 5 elements and an original element, the new pseudo-element is assigned a vector that is the average of the 6 vectors it contains, and not the average of the two pooled elements

2. Single Linkage Clustering

Single Linkage Clustering is the process of calculating the distance between two elements x and y . It is the minimum of all pairwise distances among elements contained in x and y . Unlike centroid linkage clustering, in single linkage clustering no further distances need to be calculated once the distance matrix is finished.

3. Complete Linkage Clustering

Complete Linkage Clustering is the process of calculating the distance between two elements x and y . It is the maximum of all pairwise distances between elements contained in x and y . As in single linkage clustering, no other distances need to be calculated once the distance matrix is finished.

4. Average Linkage Clustering

Average linkage clustering is the process of calculating the distance between two elements x and y . It is the mean of all pairwise distances between elements contained in x and y .

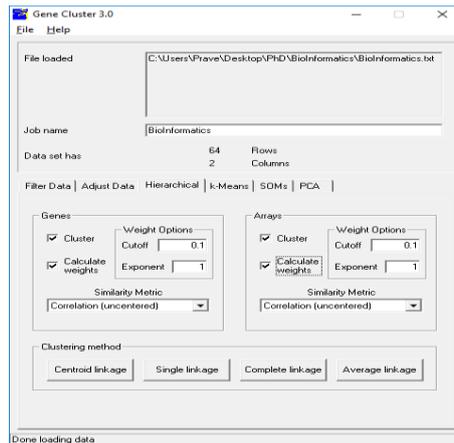


Figure 3: Hierarchical clustering

1. Output Files

Cluster results in three output files for every hierarchical clustering run. The root filename of every file Finished (current work) i.e. whatever text you enter into the Job Name dialog box. When you load a file, Job is set to the root filename of the input file. The three output files are 'Bioinformatics.cdt', 'Bioinformatics.gtr', 'Bioinformatics.atr'. The '.cdt' (for clustered data buttoned) file contains the original data with the rows and columns regrouped based on the clustering result. It is the same format as the input files, except that an additional column and/or row is added if clustering is calculated on genes and/or arrays. This additional column/row contains a unique identifier for every row/column that is linked to the description of the tree structure in the '.gtr' and '.atr' files. The '.gtr' (gene tree) and '.atr' (array tree) files are button-delimited text files that report on the history of node merging in the gene or array clustering. The '.gtr' and/or '.atr' files are automatically read in Tree View when it is open in the corresponding '.cdt' file.

B. JAVA TREE VIEW

The above clustering is calculated on different operations of Lung cancer gene values. In the method selected the 64 genes and its values for clustering operations. The method provides good results for analyze of phylogenetic tree by using the JavaTree. The output of cluster analysis especially Sample.cdt is helpful in JavaTree for constructing the phylogenetic tree.

We have applied Cluster 3.0 on biological value datasets, and used Java Tree View to generate the dendrograms (or phylogenetic trees) for every of the dataset. Figure 9 show the dendrograms of Lung cancer genes with the lengths of the branches reflecting the length between species. So, precise the branches, the evolutionarily closer the species are, and the lengthier the branches, the evolutionarily many distant the species are.

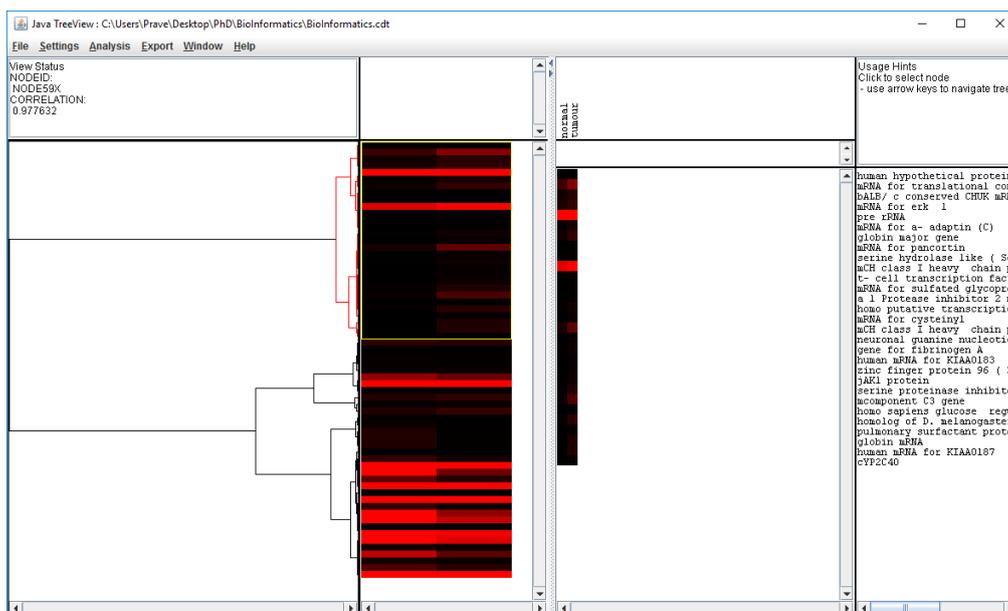


Figure 4: The dendrogram of Lung cancer gene

C. CUSTOMIZATION

The BioInformatics.cdt file generated from cluster is regenerated by automating the values in .gtr file using permutation and combinations. And new file generated replaces the existing .cdt with automated values. This new .cdt file is inputted into Java Tree Viewer to generate the intended output in figure 6.

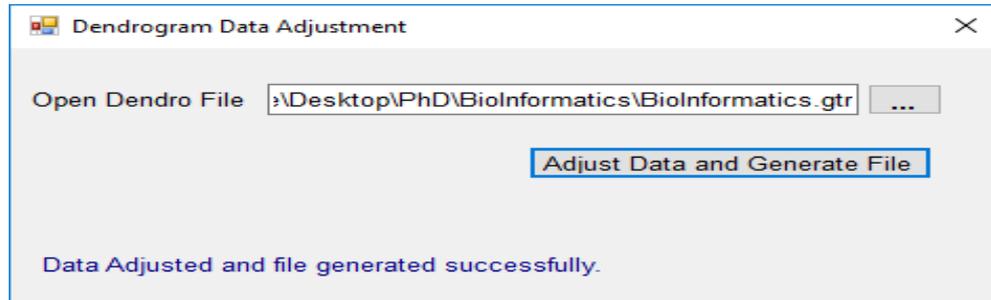


Figure 5: The dendrogram of Lung cancer gene

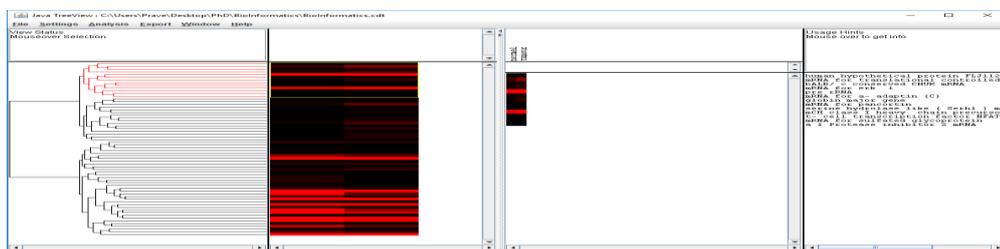


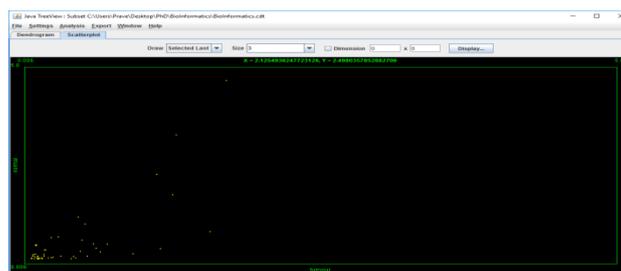
Figure 6: Customized dendrogram of Lung cancer gene

D. COMPARISON

As the values are very small in decimals from experimental values, the cluster 3.0 is not giving intended dendrogram. So in customization of the cluster is concentrated on increasing the values of the experimental values to generate intended dendrogram.

E. SCATTERPLOT

Scatter plots are useful to plot data points on a horizontal and a vertical axis in the attempt to show how much one variable is affected by another variable. Each row in the data table is represented by a marker whose position depends on its values in the columns set on the X and Y axes. The emphasis of coordinate values lying in the same region approximately, proves that it's belong to a group called cluster.



IV. CONCLUSION

In the current work, its proved that using Lung cancer gene shown the phylogeny of the genes of Mouse and human lung cancers were being clustered and can be additionally be utilized to make gene networks. The notable contribution of this study is to demonstrate that with the usage of clustering, the phylogeny of species can be made by a higher level function. The scientific experimental results have shows that the approach is appealing exact in many of cases, definitely indicating that effectiveness of the method.

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ELECTRONIC WASTE (E-WASTE): A GROWING CONCERN AND THE OPPORTUNITIES.

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ABSTRACT: E-Waste is one of the rapidly growing problems of the world. It comprises of old, end-of-life electronic appliances such as computers, laptops, TVs, DVD players, Refrigerators, freezers, mobiles, MP3 players, Washing machines etc. Our planet is suffering from environment related problems and now electronic waste is also in the list. E-Waste consists of multitude of components, some containing toxic substances like lead, cadmium and some acids that can have an adverse impact on human health and the environment. Life is getting easier as the technology is growing rapidly. But on the other hand equal amount of mess is created in the name of waste.

In India, E-Waste management assumes greater significance not only due to the generation of its own E-Waste but also because of dumping of E-Waste from developed countries. This is coupled with India's lack of appropriate infrastructure and procedures for its disposal and recycling. Putting the onus of recycling of E-Waste on producers, the MOEF has for the first time notified E-Waste management rules. (2011). This paper is associated with issues, impacts and remedies of this emerging problem, in the light of initiatives in India. It includes Reduction, Reuse, and Recycling of E-Waste. Reduce your generation of E-Waste through smart procurement and good maintenance. Reuse still functioning electronic equipment by donating or selling it to others who can use it, recycle those products that can't be repaired by finding an appropriate organization.

INTRODUCTION

It might have taken decades of years to develop things and make it right for the proper use. We are in the rapid development phase of the technology where the output is quick and easily obtained. Globalization and information technology are being widely recognized as main drivers of the human civilization in the later part of twentieth century and the 21st century. Man has become very much addicted to the technology that his day begins and ends with the use of technology. The Information Technology (IT) has been the power house of the global economy particularly since early 1990s. Software and hardware part of IT has touched most of the parts of social, technical, economic and natural environment. Many devices are constructed and created with the latest advancement. Exponentially increasing production of computer hardware has posed major challenges of proper disposal of the waste (e-waste) produced by this industry. Any electronic device is not permanent it has a particular lifetime after which usually they are disposed. Current study focuses on the effect of usage, dumping and recycling of the electronic waste on the natural environment. The paper has five sections. In the introduction section size of the global and Indian electronics market (particularly computers) has been presented. Next section is born out of hazardous impact of different chemicals disposed in environment in the process of computer usage, disposal and inefficient recycling. The third section brings out the dynamics of international trade, environmental regulations and technology transfer issues for comprehensive understanding of e-waste issues mainly caused by computers. The fourth section describes the case of India in this regard which has been presented in the above mentioned broader context. The paper is concluded with discussion, conclusion and recommendations for better management of e-waste.

I. ELECTRONICS: THE GROWING INDUSTRY

Global electronic equipment production has grown from \$225 billion in 1980 to almost \$1 trillion in 2000, which equates to a compound average annual growth of 7.7 percent over the past 20 years. In 1980, half of all electronics systems were manufactured in North America, one quarter in Europe and the balance split between Japan and the rest of Asia. The personal computer was just emerging and the transition to digital telecommunications switching was in full swing. A dramatic shift in production leadership occurred over the next ten years. Several factors contributed to this rapid shift in global electronic equipment production. During the 1980s, the Japanese economy was the envy of the world. GDP per capita had risen from \$5,000 in 1960 to \$15,000 in 1980, and by 1990 had reached \$22,000. Through the companies like Sony, Panasonic etc. of Japan had become the clear leader in innovation of consumer electronic products and high volume sophisticated electronic assembly. The combination of growing indigenous demand, global consumer electronics product leadership, and many years of investment in manufacturing technology and capacity certainly benefited worldwide electronics producers during the 1980s. The last ten years have spawned enormous change in the global economy and in the electronics industry because of Democratization of Eastern Europe and the integration of the EU economies, an increasingly pragmatic commercial orientation by China,

- Rapidly increasing economic growth elsewhere in Asia,
- The longest economic expansion in the USA,
- Low cost production from Japan and
- The bursting of the "bubble" economy

Asian production has continued to thrive, surpassing \$200 billion in 2000 and accounts for more than 20 percent of total production worldwide. Asian production of electronics is to a large extent export-driven. But investment was focused to

serve the personal computer industry, cellular telephone production, as well as fulfillment of fast-growing domestic demand for consumer and industrial electronics. This has encouraged the manufacturing base for continued expansion. China India, Brazil and other developing countries are playing an increasing role in the IT market. IT related industry is expected to grow 11% in 2006. In the last five years (1995-2000), the Indian IT industry has recorded a CAGR (Compounded Annual Growth Rate) of more than 42.4 per cent, which is almost double the growth rate of IT industries in many of the developed countries. Over the decade the industry has developed more than 150 major hardware players, supported by over 800 ancillary units and small time vendors engaged in sub assemblies and equipment manufacturing. All this has increased the installed base to more than 5 million PCs and as on December 31, 2000, the penetration rate to more than 5 PCs per 1,000 people.

II. FORMS OF E-WASTE

Electronic Waste (e-waste) is the term used to describe old, end-of-life electronic appliances such as computers, laptops, TVs, DVD players, mobile phones, mp3 players etc. which have been disposed of by their original users. Technically, electronic waste is only a subset of WEEE (Waste Electrical and Electronic Equipment).

According to the OECD any appliance using an electric power supply that has reached its end-o f-life would come under WEEE. Acknowledging the benefits of IT revolution this section presents darker reality of information technology. Very speed of innovation that lies at the heart of computer manufacturer leads to the product obsolescence. The reality of computer life cycle reveals a hazardous life cycle. The dark side of high technological development of electronic industry, especially computer technology, is revealed in the form of polluted drinking water, waste discharges that cause harm to fish, birth defects, high rate of miscarriage and cancer among cluster workers.

Rapid changes in computer technology and the emergence of new electronic goods, the growing dependence on information technology, increasing rates of consumption of electronic products have led to disastrous environmental consequences. This high tech benefits and boom in the market lead to extensive use of electronic goods, especially computers. All this is turning the face of the industry and collectively form a problem of electronic waste the percentage of waste that is technology-related is growing at an alarming rate. In a recent study researchers found that the volume of e-waste is increasing by 3 - 5% per year, which is almost three times faster than the municipal waste stream is growing generally. The lifespan of a computer has shrunk from four or five years to about two years Electronics, the largest and fastest growing manufacturing industry in the world, aggressively promotes a culture of fast obsolescence and increased consumption. Large amounts of dangerous chemicals are present in computer and other electronic goods. The toxicity is due to lead, mercury, cadmium, hexavalent chromium (ChromiumVI), brominated flame retardants, plastic, PVC etc. as

S.No.	Hazardous components	Effect of Hazardous components of e-waste
1	Arsenic	Can affect skin and can decrease nerve conduction velocity. Chronic exposure to arsenic may cause lung cancer and sometimes be fatal.
2	Lead	May affect kidneys, reproductive systems, nervous connections. May cause blood and brain disorders, sometimes may be fatal.
3	Barium	Can affect heart muscle.
4	Chromium	Candamage liver, kidneys and may cause asthmatic bronchitis and lung cancer.
5	Beryllium	May cause lung diseases.
6	Mercury	Affects the central nervous system, kidneys and immune system, it impairs foetus growth. May cause brain or liver damage
7	Cadmium	May cause severe pain in the joints and spine. It affects the kidneys and softens bones.
8	BER (Brominated flame retardants)	Can harm reproductive and immune systems, may cause hormonal disorder.
9	Chlorofluorocarbon (CFC)	May affect the ozone layer. It may cause skin cancer in human and genetic damage in organisms.
10	Polychlorinated Biphenyl (PCB)	May cause cancer in animals, can affect the immune system, reproductive system, nervous system, endocrine system . PCBs persistently contaminate in the environment and cause severe damage .
11	Polyvinyl Chloride (PVC)	PVC contains upto 56% chlorine and when burnt, produces Hydrogen chloride gas which in turn produces hydrochloric acid that is dangerous to respiratory system.
12	Dioxin	These are highly toxic to animals and can lead to malfunction of foetus, decreased reproduction and growth rates, affect immune system.

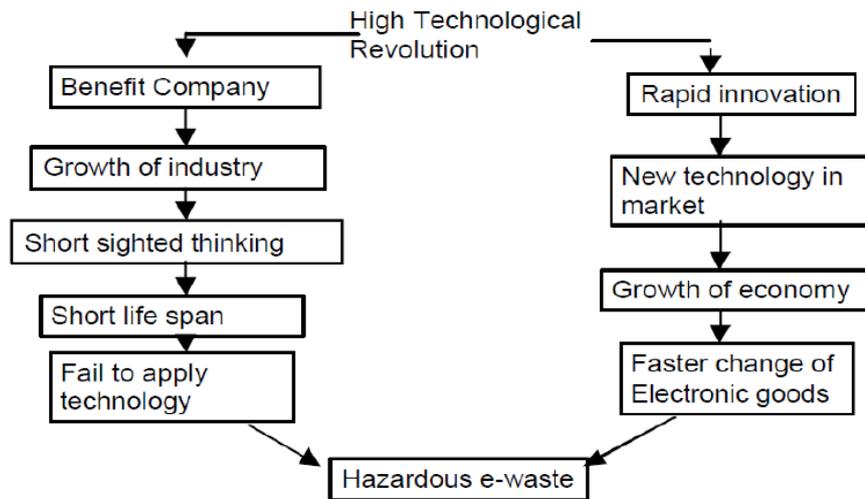
follows in table:

A typical computer monitor may contain more than 6 percent lead by weight. In general, computer and electronic equipments are complicated assembly of more than 1000 materials, few of them are highly toxic such as chlorinated and brominated substances, toxic gases, photoactive and biological active materials acids plastics and plastic additives (Clean computer campaign). Each computer display contains an average of 4-8 pound of lead (MCC: 1996). Monitor glass contains about 20 percent lead by weight. When these components are illegally disposed and crushed in landfills, the lead is released into the environment, posing a hazardous legacy for current and future generations.

About 70 percent of the heavy metals including mercury and cadmium, found in landfills come from electronic equipments discarded by the users. These heavy metals and other hazardous substances found in electronics items, contaminate ground water and pose environmental and public health risks, (Poison PC and Toxic TV) A single component of computer waste, Cathode Rays Tube (CRTs), has emerged as the leading edge of hazardous waste at the local, state, national and international level. CRTs are the glass Picture Tubes in computer monitors and other video display devices that amplify and focus high energy electrons beam to create the images, which we ultimately see in our screens.

In order to protect consumers from radiation damages, the glass in CRTs contain lead compasses which is approximately 20 percent of each CRT. Lead is an example of heavy metal, a metallic element that is in pure form heavy. According to Xinhua News Agency, China has generated roughly 1.1 million tons of e-waste annually since 2015, including 5 million TV sets, 4 million refrigerators, 5 million washing machines, 5 million computers, and tens of millions of mobile phones and it will continue to pile up. Greenpeace estimates that by 2016, there will be 178 million new computer users in China alone. The U.S. National Safety Council predicts that in that country alone between 315 million and 680 million computers will become obsolete within the next few years. The waste will contain more than 2 billion kg of plastic, 0.5 billion kg of lead, 1 million kg of cadmium, 0.5 million kg of chromium and nearly 200,000 kg of mercury. Environmentalists also worry that with the popularity of new liquid crystal display technology, an increasing number of old monitors using cathode ray tubes are ending up in the trash. The disposal problem regarding the tens of millions of first generation mobile phones are today’s emerging challenge. Total estimated e-waste generated from computer, television, refrigerator and washing machines is 1,46,180 tones and is expected to go up to around 1,600,000 by 2012.(CII,2006)

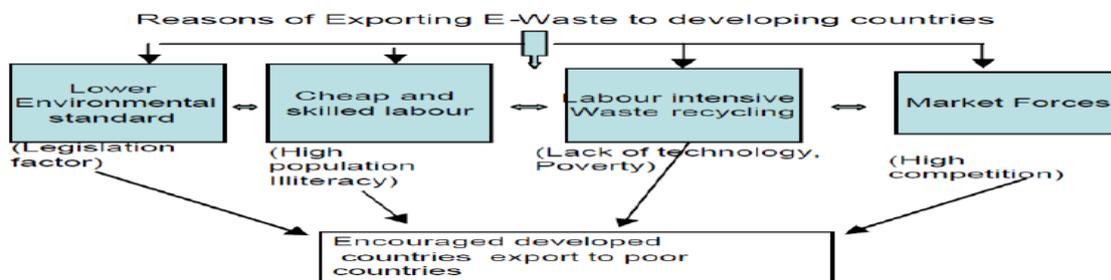
Electronics Helpful Vs Harmful



III. REASONS OF THE FLOW OF E-WASTE TO DEVELOPING COUNTRIES

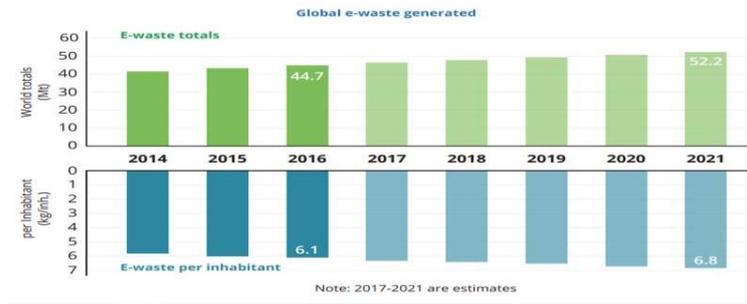
Only 20 percent of electronic waste is being recycled globally every year as incomes rises and prices fall, predictions for the future are looking grim. ‘Equal in weight to almost nine Great Pyramids of Giza, 4,500 Eiffel Towers, or 1.23 million fully-loaded, 18-wheel, 40-ton trucks, enough to form a line 28,160km long, the distance from New York to Bangkok and back.’ That’s the scale of the world’s growing amount of electronic waste, according to the United Nations University (UNU), which has co-authored the The Global E-waste Monitor 2017.

Due to lower environmental standards and working conditions in China and India, e-waste is being sent to these countries for processing – in most cases illegally. Uncontrolled burning and disposal are causing environmental problems due to the methods of processing the waste. The labor-intensive nature of electronic waste recycling, abundant, cheap and skilled labor force and generation of huge profits for local governments causes the authorities to turn a blind eye to this practice. Thus, they serve as passive encouragement to its spread. It is more convenient and also economical to export e-waste to the third world countries like India, rather than managing and incurring high environmental and economic cost.



Various departments of the government, public as well as private sectors are responsible for fast feeding of old electronic appliances such as computers, telephones, mobile phone, etc, into the waste stream. Other sources of e-waste are retailers, individual households, foreign embassies, PC manufacturing units, players of the secondary market, and imported electronic scraps from other countries. Individual households have the least contribution in generating of IT product obsolescence. Most Indian households prefer to pass their obsolete technology to near and dear ones or exchange it from the retailer. It is the illegal dumping of junked computers from other parts of the world that generates the biggest part of the

e-waste In India; the mountains of e-waste have not yet manifested themselves. This is because of the propensity not to throw away equipment, even if it is obsolete, till it becomes totally unserviceable. But, in the younger generation, this attitude is changing and the throwaway culture of the west is slowly permeating into the country. Another factor limiting generation of e-waste in India is that we do not have a sizeable IT hardware manufacturing infrastructure as yet. We also commenced large scale computerization a bit late in this country, compared to the developed countries. Overall E-Waste generated in the upcoming years is estimated in the form of graphical representation.



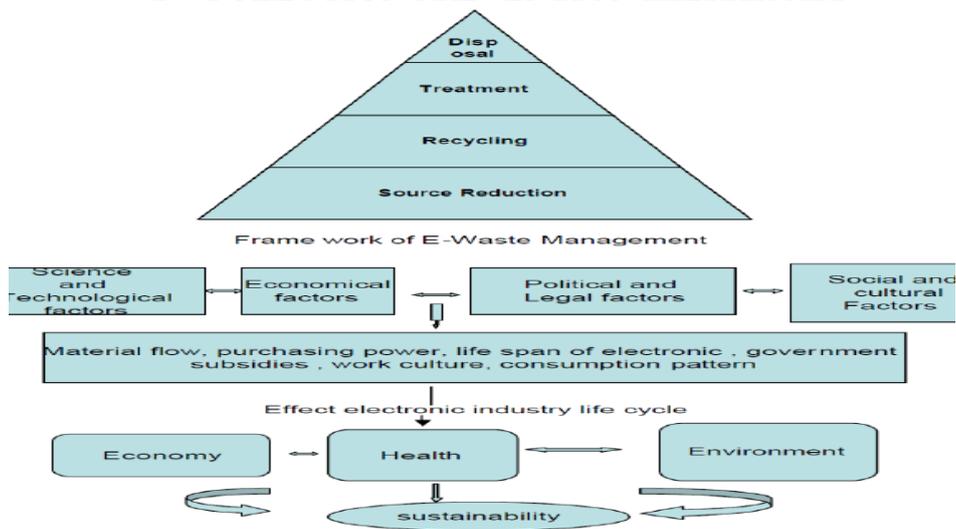
IV. TOTAL AMOUNT OF E-WASTE IN INDIA

Around 1,050 tonnes of electronic scrap is being produced by manufacturers and assemblers in a single calendar year.

- In a single month, there is a reported case of import of 30 metric tonnes (MT) of e- waste at Ahmadabad port.
- The minimum number of computers procured by an average scale scrap dealer is 20-25 per month.
- The approximate number of scrap dealers specializing in electronics, in and around Delhi, is more than 40. This figure also includes large scale dealers who handle thousands of PCs per month.
- Approximately 1.38 million personal computers become obsolete every year.
- The IT and IT enable services are expanding at a faster rate in and around the national capital region like: Delhi, Gurgoan and Noida. Over the last five years, the Indian IT industry has recovered a compound annual growth rate of more than 42.4 %, which is almost double the growth rate of IT industry in many of the developing countries. Indian configuration of PC per 500 people is going to change to 1 for 50 by 2008.
- The total WEEE generation in India has been estimated to be 1, 46,180 tonnes per year based on selected EEE tracer items. Almost 50% of the PCs sold in India are products from the secondary market and are re-assembled on old components. The remaining market share is covered by multinational manufacturers (30%) and Indian (22%) brands.
- Mumbai currently tops the list of major cities with e-waste.
- Foreign companies helping Indian importers bypass government regulations to bring in the goods for recycling.
- Bangalore may be generating 10,000 to 15,000 tons of e-waste every month, according to industry sources. The Karnataka State Pollution Control Board has put it at 10,000 tons a month. Along with discarded obsolete hardware, many western countries are selling off their e-waste as scrap and some of this reach scraps dealers in this city. Metal components and some of the outer casings are resold, while the rest of the computers are dumped haphazardly.

V. POLLUTION PREVENTION HIERARCHY

VI. POLLUTION PREVENTION HIERARCHY



other electronics. As the Japanese government requires companies to take back products containing lead, companies such as Sony, Panasonic, Hitachi, Sharp, NEC, and Toshiba are investing in lead-free technologies. Also in 1998, Taiwan started a take-back system for computers, televisions, and large home appliances that requires retailers to accept used electronics, regardless of where they were sold.

XI. CONCLUSION

Most waste is inherently dangerous. It can degrade to produce leachate, which may contaminate ground water, and create landfill gas, which is explosive. In addition, because of the dangers associated with landfill sites, there are now very strict requirements on the construction, operation and aftercare of such sites. Most planning authorities want a worked out quarry to be used for landscaping rather than a landfill site which no one wants in their „back yard“. Product design must be employed to help to minimize not only the nature and amount of waste, but also to maximize end-of-life recycling. Manufacturers, retailers, users, and disposers should share responsibility for reducing the environmental impacts of products. Adopt product stewardship approach i.e. a product-centered approach should be adopted to preserve and protect environment.

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NATURAL CONVECTION IN A SPARSELY PACKED POROUS MEDIUM.

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Abstract: In the present study the theoretical and numerical results of linear and weakly nonlinear analysis of Rayleigh-Benard convection in a sparsely packed porous medium is reported. In linear stability analysis, we studied the onset of stationary convection and proved that oscillatory convection does not exist for the Rayleigh-Benard convection model with the boussinesq approximation in a sparsely packed porous medium. We have derived a nonlinear Ginzburg-Landau equation with real coefficients at the onset of supercritical pitchfork bifurcation. We discuss the heat transfer near the neutral region through the Nusselt number. We have obtained the conditions for Eckhaus and zigzag instabilities near the onset. We have also derived a nonlinear two dimensional cubic-quintic Ginzburg-Landau equation with real coefficients at the onset of stationary convection and discussed about the behavior of the convective system.

1. Introduction

Convection in a porous medium uniformly heated from below is of considerable interest in geophysical fluid dynamics as the phenomena may occur within the Earth([1]-[2]). In geothermal regions, the surface liquid possesses a general upward convective drift due to the buoyancy induced by Joule heating and interior temperature. Since rising liquid is cooled as it approaches the surface where heat is removed by evaporation, radiation and movement in surface steams, the unstable state may be induced and complicated convective motions appear in the layers near the surface. Thus convection in a porous medium enables us to study heat transfer from the deep interior of the Earth to shallow depth in geothermal region. Natural convection in a sparsely packed porous medium with isotropic diffusivities is motivated by the study of the convection in mushy layer of Earth's interior (near the inner core) where the molten iron is electrically conducting, which can become convectively unstable as a result of differential rotation. The porous medium (mushy layer in Earth's interior near the inner core) may be thought of as being composed of closely packed uniform spheres(grains) completely surrounded by a homogeneous fluid (palm et.al. 1972). We consider a continuum model for a porous medium, introducing a cartesian reference frame and consider volume elements that are sufficiently large compared with the pore volumes for reliable volume averages to be obtained.

In our model, we study the linear and weakly nonlinear approaches to convection of a sparsely packed porous medium. In Section 2, we write basic dimensionless equations in Boussinesq approximation by using momentum equation for Darcy-Lapwood-Brinkman model with effective viscosity different from the fluid viscosity. In Sec 3, we study linear stability analysis. In Sec 4, we study weakly nonlinear analysis by using multiple scale analysis of Newell and Whitehead(1969)[6], we have derived the two-dimensional nonlinear Ginzburg-Landau equation with real coefficients near the supercritical pitchfork bifurcation and discussed about secondary instabilities. We have studied the effect of physical parameters on heat transfer rate. We have obtained the conditions for Eckhaus and zigzag instabilities near the onset. We have derived a nonlinear two dimensional cubic-quintic Ginzburg-Landau equation with real coefficients at the onset of stationary convection and discussed about the behavior of the convective system. In Sec 5, we write conclusions of our paper.

2. Basic equations

We consider an electrically and thermally conducting inviscid fluid saturating an infinite horizontal layer of a sparsely packed isotropic porous medium of depth 'd'. The layer is heated from below and cooled from above and the linear profile of the temperature is sustained. The upper and lower bounding surfaces of the layer are assumed to be stress-free, Boussinesq approximation is valid. The temperature difference across the stress-free boundaries is $\Delta T'$ and the flow in the sparsely packed porous medium is governed by the Darcy-Lapwood Brinkman model. We shall employ dimensionless units in which length is measured in d , time t in Md^2/κ , velocity in κ/Md , temperature θ in βd and pressure p in $\rho_0 \kappa^2 M^{-2} d^{-2}$. Here Md^2/κ is thermal diffusion time in a porous medium. We then have the basic dimensionless perturbed equations which describe the Rayleigh - Benard convection in a sparsely packed porous medium with Boussinesq approximation :

$$\nabla \cdot \vec{V} = 0.$$

$$(1) \quad \frac{1}{M^2 \phi \text{Pr}} \left[\frac{\partial \vec{V}}{\partial t} + \frac{1}{\phi} (\vec{V} \cdot \nabla) \vec{V} \right] = -\nabla \left(\frac{P}{M \text{Pr}} \right) - \frac{1}{MDa} \vec{V} + \frac{\Lambda}{M} \nabla^2 \vec{V} + R \theta \vec{e}_z. \quad (2)$$

$$\left(\frac{\partial}{\partial t} - \nabla^2 \right) \theta - \frac{w}{M} = -\frac{1}{M} (\vec{V} \cdot \nabla) \theta. \quad (3)$$

The dimensionless parameters in the above equations for the description of the motion are, Rayleigh number, $R (= \alpha g \Delta T d^3 / \kappa \nu)$, Prandtl number $\text{Pr} = \nu / \kappa_T$ and Darcy number $Da (= K / d^2)$.

To provide a non-trivial solution to the system it is convenient to apply the curl operator ($\nabla \times$) on eq.(2) and obtain an equation which includes the vorticity, defined as $\vec{\omega} = \nabla \times \vec{V}$. Again applying curl and using the property of \vec{V} being solenoid, which comes from eq.(1), yields an equation. From these two equations on considering the z-component and eliminating θ from the linear part we get,

$$\mathcal{L}W = \mathcal{N}, \quad (5)$$

$$\text{where } \mathcal{L} = \left(\frac{1}{M^2 \phi Pr} \frac{\partial}{\partial t} + \frac{1}{MDa} - \frac{\Lambda}{M} \nabla^2 \right) \left(\frac{\partial}{\partial t} - \nabla^2 \right) \nabla^2 - \frac{R}{M} \nabla_h^2,$$

$$\text{and } \mathcal{N} = \frac{1}{M^2 \phi^2 Pr} \left(\frac{\partial}{\partial t} - \nabla^2 \right) \hat{e}_z \cdot \nabla \times \left[\left(\vec{V} \cdot \nabla \right) \vec{\omega} - \left(\vec{\omega} \cdot \nabla \right) \vec{V} \right] - \frac{R}{M} \nabla_h^2 \left(\vec{V} \cdot \nabla \right) \theta.$$

We considered stress free boundary conditions([7]) and assume that the medium adjoining the fluid is perfect conductor of heat

$$W = \frac{\partial^2 W}{\partial z^2} = 0, \quad \frac{\partial \omega_z}{\partial z} = 0, \quad \theta = 0 \quad \text{on} \quad z = 0, z = 1.$$

3. Linear stability analysis:

In Linear stability theory we take the perturbations to be arbitrarily small and so we neglect those terms in the governing equations which are product of the perturbations and their derivatives as compared to linear terms. Thus we get a system of homogeneous linear differential equations with homogeneous boundary conditions. Therefore in the linear stability theory, the perturbations either grow exponentially or the magnitude of the perturbations remain constant. If the perturbations grow exponentially then the system is said to be unstable and if the magnitude remains constant then the system is said to be in the marginal state. By using normal mode method we analyze the stability of convective system and obtain the threshold conditions for stationary convection and oscillatory convection. We study the onset of convection for the roll pattern.

The corresponding linear equations are

$$\left(\frac{1}{M^2 \phi Pr} \frac{\partial}{\partial t} - \frac{\Lambda}{M} \nabla^2 + \frac{1}{MDa} \right) \vec{V} = - \frac{\nabla p}{M Pr} + R \theta \hat{e}_z \quad (6)$$

$$\left(\frac{\partial}{\partial t} - \nabla^2 \right) \theta = \frac{w}{M} \quad (7)$$

$$\nabla \cdot \vec{V} = 0 \quad (8)$$

$$\text{Curl of eq. 6 gives } \left(\frac{1}{M^2 \phi Pr} \frac{\partial}{\partial t} - \frac{\Lambda}{M} \nabla^2 + \frac{1}{MDa} \right) \vec{\omega} = \nabla \times (R \theta \hat{e}_z) \quad (9)$$

Where $\vec{\omega} = \nabla \times \vec{V}$. Taking curl of eq.9 and then taking the z-component we get

$$\left(\frac{1}{M^2 \phi Pr} \frac{\partial}{\partial t} - \frac{\Lambda}{M} \nabla^2 + \frac{1}{MDa} \right) \nabla^2 w = R \nabla_h^2 \theta. \quad (10)$$

By eliminating θ from eqs. (6) and (10), we obtain

$$\left(\frac{\partial}{\partial t} - \nabla^2 \right) \left(\frac{1}{M^2 \phi Pr} \frac{\partial}{\partial t} - \frac{\Lambda}{M} \nabla^2 + \frac{1}{MDa} \right) \nabla^2 w = R \nabla_h^2 w. \quad (11)$$

We see that eq.(11) and the boundary conditions are symmetric in x,y. Here we can expand w in terms of special modes in the horizontal direction of the wave number q with temporal variation as e^{pt} . The solution of the linear eq.(11) with boundary conditions can be written as $w = W(z) A(x, y) e^{pt}$. (12)

When w decreases exponentially then the layer of fluid become stable with time ($p < 0$, damping). We describe that situation as marginally stable, if $p = 0$ and in case w increases exponentially with time ($p > 0$), the layer of fluid is unstable.

We study the stability of conduction state for roll pattern by assuming an analytic solution

$$w = W(z) e^{iqx + pt}, \quad (13)$$

where the wavenumber q is real constant and p the growth rate, is a constant that may be complex. On substituting eq.(13) into the linearised version of eq.(5) viz., $\mathcal{L}w = 0$, we obtain an equation

$$\left[\delta^2 (\delta^2 - p) \left(\frac{\Lambda}{M} \delta^2 - \frac{1}{MDa} - p \frac{1}{M^2 \phi Pr} \right) + \frac{Rq^2}{M} \right] W(z) = 0 \quad (14)$$

where $\delta^2 = (D^2 - q^2)$,

Stationary convection

For the onset of stationary convection, We set $W(z) = \sin \pi z$ and substituting $p = 0$, into eq.(14) and obtain

$$R = \frac{M(\pi^2+q^2)^2}{q^2} \left[(\pi^2 + q^2) \frac{\Lambda}{M} + \frac{1}{MDa} \right] \tag{15}$$

Equation (15) gives the value of Rayleigh number for Darcy – Lapwood- Brinkman model of porous medium. We define the minimum of R from eq.8 as $\left(\frac{\partial R}{\partial q}\right)_{q=q_{sc}} = 0$ which implies that,

$$\Lambda(2q_{sc}^4 + \pi^2 q_{sc}^2 - \pi^4) + \frac{1}{Da} (q_{sc}^2 + \pi^2) = 0. \tag{16}$$

Solving eq. (16) for different values of Da and Λ , we get the value of critical wave number q_{sc}

for the onset of stationary convection. Threshold for the onset of stationary convection is given with $q_s = q_{sc}$. Substituting this value of q_{sc} into eq.(15), we get the value of Rayleigh number for the onset of stationary convection as

$$R_{sc} = \frac{M\delta_{sc}^4}{q_{sc}^2} \left[\frac{\Lambda}{M} \delta_{sc}^2 + \frac{1}{MDa} \right] \tag{17}$$

Where $\delta_{sc}^2 = (\pi^2 + q_{sc}^2)$.

Here R_{sc} denotes the critical Rayleigh number. It represents the threshold value at which the convection first sets in and it corresponds to the pitchfork bifurcation. Pitchfork bifurcation arises, when the characteristic equation possesses a simple zero eigenvalue. We have observed graphically the solid neutral curves corresponding to the critical Rayleigh numbers of stationary convection, as Λ increases the onset of stationary convection increases.

Oscillatory convection

For the onset of oscillatory convection we set $p = i\omega$ and $R = R_o$ in eq.(14) we get a relation in which equating the real and imaginary parts we obtain

$$R_o = \frac{M}{q_o^2} \left(\delta_o^4 \left(\frac{\Lambda}{M} \delta_o^2 + \frac{1}{MDa} \right) - \frac{\omega^2}{M^2 \phi Pr} \right) \tag{18}$$

$$\omega \left(\frac{\delta_o^4}{M^2 \phi Pr} + \delta_o^2 \left(\frac{\Lambda}{M} \delta_o^2 + \frac{1}{MDa} \right) \right) = 0 \tag{19}$$

Thus from the above equation (19) we can say either $\omega = 0$ or $Pr = -\frac{\delta_o^2}{M^2 \phi \sigma_o}$, where $\sigma_o = \left(\frac{\Lambda}{M} \delta_o^2 + \frac{1}{MDa}\right)$. But we know that Prandtl number Pr is always positive. Therefore we must have $= 0$, and hence oscillatory convection doesnot exist for the Rayleigh- Benard convection with the boussinesq approximation in a sparsely packed porous medium. This result is true for both free-free and rigid- rigid boundary conditions.

4. Weakly nonlinear analysis:

The evolution of general patterns developed by means of a multiple scale analysis used by Newell and Whitehead (1969), yields the two dimensional Landau-Ginzburg equation of complex valued amplitude of imposed disturbance with real coefficients for the parallel roll pattern. For the values of R close to threshold value R_{sc} , the behavior of the convective system can be analyzed by writing solutions of eq.(1-4) in power series of ϵ as

$$f = \epsilon f_0 + \epsilon^2 f_1 + \epsilon^3 f_2 + \dots, \text{ where } \epsilon^2 = \frac{R-R_{sc}}{R_{sc}}, f = (u, v, w, \omega_{x0}, \omega_{y0}, \omega_{z0}, H_x, H_y, H_z), \tag{20}$$

with the first approximation given by the eigenvector of the linearised problem: $w_0 = A(X, Y, T) e^{im_{sc}Y} \sin \pi z + c.c...$

.Complex amplitude $A(X, Y, T)$ depends on the slow variables X, Y and T . X, Y and T are scaled by introducing the multiple scales $X = \epsilon x, Y = \epsilon y, z = z, T = \epsilon^2 t$. The partial derivatives are given by

$$\frac{\partial}{\partial x} \rightarrow \frac{\partial}{\partial x} + \epsilon \frac{\partial}{\partial X}, \frac{\partial}{\partial y} \rightarrow \epsilon \frac{\partial}{\partial Y}, \frac{\partial}{\partial z} \rightarrow \frac{\partial}{\partial z}, \frac{\partial}{\partial t} \rightarrow \epsilon^2 \frac{\partial}{\partial T}. \tag{21}$$

With the assumption eq.(14), the nonlinear equations eq.(1-4) are transformed into a set of linear in homogeneous equations. The solvability condition for the later yields the required amplitude equation. Using eq.(14) into eq.(5) and comparing terms of equal order in ϵ on either side of eq.(5) we get,

$$\mathcal{L}_0 w_0 = 0, \tag{22}$$

$$\mathcal{L}_0 w_1 + \mathcal{L}_1 w_0 = N_0, \tag{23}$$

$$\mathcal{L}_0 w_2 + \mathcal{L}_1 w_1 + \mathcal{L}_2 w_0 = N_1, \tag{24}$$

where $\mathcal{L} = \mathcal{L}_0 + \epsilon \mathcal{L}_1 + \epsilon^2 \mathcal{L}_2...$ and $N = \epsilon^2 N_0 + \epsilon^3 N_1 + \dots$

Here $\mathcal{L}_0, \mathcal{L}_1, \mathcal{L}_2$ are complicated expressions. The solvability criteria of eq.(18) gives the amplitude equation which can be written as

$$\lambda_0 \frac{\partial A}{\partial T} - \lambda_1 \left(\frac{\partial}{\partial X} - \frac{i}{2q_{sc}} \frac{\partial^2}{\partial Y^2} \right)^2 A - \lambda_2 A + \lambda_3 |A|^2 A = 0 \quad , \quad (25)$$

where

$$\lambda_0 = \delta_{sc}^4 \left(\frac{1}{M^2 \phi Pr} + \frac{\Lambda}{M} \right) + \frac{\delta_{sc}^2}{MDa} ,$$

$$\lambda_1 = 4 \left(\frac{3\Lambda}{M} \delta_{sc}^2 - \frac{1}{MDa} \right) , \lambda_2 = \frac{R_{sc}}{M} q_{sc}^2$$

$$\lambda_3 = \frac{\kappa_{sc} q_{sc}^2}{2M^2 \delta_{sc}^2} .$$

Equation (25) is the two-dimensional nonlinear time-dependent Landau-Ginzburg

equation describing the effect of Rayleigh-Benard convection near the onset of stationary convection at supercritical pitchfork bifurcation.

Here $\lambda_0, \lambda_1, \lambda_2$ and λ_3 are always positive. The pitchfork bifurcation is supercritical if $\lambda_3 > 0$ and subcritical if $\lambda_3 < 0$. At $\lambda_3 = 0$, we get tricritical bifurcation point.

Heat transport by convection: We discuss the heat transfer near the neutral region through the Nusselt number. Since the amplitude equation (25) is valid for $\lambda_3 > 0$, which is possible for $R > R_{sc}$ (supercritical pitchfork bifurcation), we get $Nu > 1$ for $R > R_{sc}$. Thus we get convection for $Nu = 1$. In stationary convection Nu increases implies that heat conducted by steady mode increases.

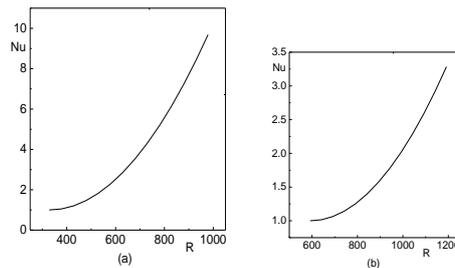


Figure 1: figure is plotted in the (R-Nu)-plane, for fixed values of parameters $Da = 1500, \phi = 0.9, M = 0.9$, various values of Λ . In both the figures solid line starts from $Nu = 1$. We observe that as Λ increases Nu increases.

Secondary instabilities:

We have obtained conditions for long wavelength instabilities viz. Eckhaus instability and zigzag instability. Landau-Ginzburg equation.(25) with fast variables x, y, t gives conditions for Eckhaus instability $\sqrt{\epsilon^2 \lambda_2 / 3\lambda_1} \leq \delta q_s \leq \sqrt{\epsilon^2 \lambda_2 / \lambda_1}$ and zigzag instability $\delta q_s < 0$. We observe that the Eckhaus instability and zigzag instability regions increase with increase in Λ .

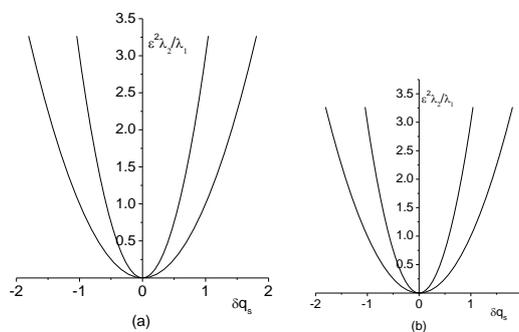


Figure 2: Eckhuas instability(E) exists between the two lines $\delta q_s^2 = \epsilon^2 (\lambda_2 / 3\lambda_1)$ and $\delta q_s^2 = \epsilon^2 (\lambda_2 / \lambda_1)$. Zigzag instability(Z) exists in the $\delta q_s^2 < 0$ region. Stable rolls(S) exist in the $\delta q_s^2 > 0$ region. Figures (a,b) are plotted for the fixed values of $Da = 1500, \phi = 0.9, M = 0.9$ and with increasing values of Λ .

The **higher order non linear amplitude equations** are important models which can be used to describe the phenomena in media of very different physical nature such as hydrodynamics. To ensure that we obtain the saturation of the amplitude we derive the **cubic-quintic amplitude equation**. For the values of R close to threshold value R_{sc} , i.e., $\epsilon^2 \ll 1$, the behavior of the convective system can be analyzed by writing solutions of eqs.(1-4) in powers of ϵ ,

$$f = \epsilon f_0 + \epsilon^2 f_1 + \epsilon^3 f_2 + \epsilon^4 f_3 + \epsilon^5 f_4 + \dots, \text{ where } f = (u, v, w, \omega_{x0}, \omega_{y0}, \omega_{z0}, H_x, H_y, H_z), \quad (26)$$

and by assuming that all variations of the linearized solutions can be incorporated into an amplitude function A . The first approximation is given by the eigen vector of the linearized problem: $w_0 = A(X, Y, T) e^{im_z \epsilon y} \sin \pi z + c.c., \dots$. Complex amplitude $A(X, Y, T)$ depends on the slow variables X, Y and T . X, Y and T are scaled by introducing the multiple scales $X = \epsilon x, Y = \epsilon y, z = z, T = \epsilon^2 t$. Accordingly the derivatives can be expressed as eq.(21). With the assumption eq.(26), the nonlinear equations eq.(1-3) are transformed into a set of linear in homogeneous equations. The solvability condition for the later yields the required amplitude equation. Using eq.(26) into eq.(5) and comparing terms of equal order in ϵ on either side of eq.(5) we get, $\mathcal{L}_0 w_0 = 0,$ (27)

$$\mathcal{L}_0 w_1 + \mathcal{L}_1 w_0 = N_0, \quad (28)$$

$$\mathcal{L}_0 w_2 + \mathcal{L}_1 w_1 + \mathcal{L}_2 w_0 = N_1, \quad (29)$$

$$\mathcal{L}_0 w_3 + \mathcal{L}_1 w_2 + \mathcal{L}_2 w_1 + \mathcal{L}_3 w_0 = N_2, \quad (30)$$

$$\mathcal{L}_0 w_4 + \mathcal{L}_1 w_3 + \mathcal{L}_2 w_2 + \mathcal{L}_3 w_1 + \mathcal{L}_4 w_0 = N_3, \quad (31)$$

where $\mathcal{L} = \mathcal{L}_0 + \epsilon \mathcal{L}_1 + \epsilon^2 \mathcal{L}_2, \dots$ and $N = \epsilon^2 N_0 + \epsilon^3 N_1 + \dots$

To determine the variation of $A(X, Y, T)$ and obtain the cubic-quintic amplitude equation we consider eq.(25), one requires that r.h.s be orthogonal to w_0 , which is ensured that if coefficient $\sin \pi z$ is zero. Hence equating coefficient of $\sin \pi z$ in $N_3 - (\mathcal{L}_0 w_4 + \mathcal{L}_1 w_3 + \mathcal{L}_2 w_2 + \mathcal{L}_3 w_1 + \mathcal{L}_4 w_0)$ to zero,

we get
$$\lambda'_0 \frac{\partial A}{\partial T} - \lambda'_1 \left(\frac{\partial^2 A}{\partial X^2} \right) - \lambda'_2 \left(\frac{\partial^2 A}{\partial Y^2} \right) - \lambda'_3 A + \lambda'_4 A |A|^2 - \lambda'_5 A |A|^4 = 0. \quad (32) \text{ Here}$$

$\lambda'_0, \lambda'_1, \lambda'_2, \lambda'_3$ and λ'_4 are complicated expressions and are all positive. Equation (32) denotes the nonlinear two dimensional cubic-quintic amplitude equation. From $\lambda'_4 < 0$ and $\lambda'_5 < 0$ we get subcritical fluid motion.

5. Conclusions:

The following are the results of Rayleigh – Benard convection in a sparsely packed porous medium. The linear stability analysis was the focus of attention from the theoretical work of Rayleigh (1916) on the stress-free(free-free) boundary conditions and work of Horton and Rogers(1945) and Lapwood(1948). Rayleigh – Benard convection in a porous medium is an example of single diffusive system and hence principle of exchange of stabilities is valid for this system which we have shown in the linear stability analysis. The convective system can be unstable to stationary convection at the onset, depends on the physical parameters. We have shown that oscillatory convection doesnot exist for the Rayleigh- Benard convection with the boussinesq approximation in a sparsely packed porous medium. This result is true for both free-free and rigid- rigid boundary conditions.

By using multiple scale perturbation theory we have obtained two-dimensional Landau- Ginzburg equation at the onset of stationary convection at the supercritical pitchfork bifurcation for free free boundary conditions. From this amplitude equation we have studied the heat transfer mechanism in the convective system through Nusselt number, we get convection for $Nu > 1$ and conduction for $Nu = 1$. We observe that as Λ increases, the heat conducted by the steady mode increases. We have also obtained conditions for long wavelength instabilities viz. Eckhaus instability and zigzag instability. Landau-Ginzburg equation.(25) with fast variables x, y, t gives conditions for Eckhaus instability $\sqrt{\epsilon^2 \lambda_2 / 3 \lambda_1} \leq \delta q_s \leq \sqrt{\epsilon^2 \lambda_2 / \lambda_1}$ and zigzag instability $\delta q_s < 0$. We observe that the Eckhaus instability and zigzag instability regions increase with increase in Λ . We have derived a nonlinear two-dimensional cubic-quintic Landau-Ginzburg equation with real coefficients at the onset of stationary convection and discussed about the behavior of the convective system. From $\lambda'_4 < 0$ and $\lambda'_5 < 0$ we get subcritical fluid motion.

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EMBEDDED SYSTEMS IN DAY-TO-DAY LIFE

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ABSTRACT:

In this paper, we present the role of embedded systems in smart phones. Embedded systems are playing a greater role in making human lives more comfortable. Many electronic smart devices which we use in day to day life like washing machines, printers, industrial machines, video games, micro ovens, tablets, smart phones etc. use embedded systems in them. Embedded System interact indirectly with the world through sensors and transducers. Embedded systems are a combination of hardware and software systems used to perform a specific task. They are classified into *Standalone Embedded Systems, Real time Embedded Systems, Networked Embedded Systems and Mobile embedded system*. Telecommunications systems employ numerous embedded systems among them Smart phone is one of the best application in today's world of technology. Embedded systems have made phone into a multipurpose device with improved connectivity, as a radio, as a GPS system for location sensing, as a CMOS camera fitted inside, for playing games, USB module for enabling the data for input or output, a memory storage element for storage of information etc.

Key words: Embedded systems, Microprocessors, Micro controllers, smart phone

INTRODUCTION

Our lives are surrounded with gadgets which use embedded systems for their proper functioning. Television, Radio, CD player of your living room, Washing Machine or Microwave Oven in your kitchen, Card readers, Access Controllers, palm tops ,smart phones etc, enable us to do many tasks very effectively. New devices developed with latest technologies for better living with more applications are filled with embedded systems.

Embedded systems carryout a specific work for which they are designed. Most of the time, they are designed to do a specific task and cannot be installed in some other place.

Theoretically, an embedded controller is a combination of a piece of microprocessor-based hardware and the suitable software supported with sensors and transducers.

Microcontrollers and Microprocessors are used in embedded system. We have many choices in selecting a microprocessors/microcontrollers. Especially, in 8 bit and 32 bit processors selecting a right microprocessor is the first step for designing an embedded system as per required task assigned to it. In the 8-bit segment, the most popular and used architecture is Intel's 8031. Due to its versatile performance many embedded systems are developed on the architecture of 8031.

HISTORY

The first modern embedded systems was the Apollo Guidance computer, developed by Charles Stark Draper at the MIT Instrumentation Laboratory. An early mass-produced embedded system was Autonetics D-17 computer for the Minuteman missile, released in 1961.

The Intel 4004 is an early microprocessor which was designed for calculators and other small systems but was dependent on external memory and support chips.

In 1978 National Engineering Manufacturers Association released a 'Standard' for programming microcontrollers, including almost any computer-based controllers, such as single board computers, numerical and event-based controllers.

Microcontrollers for Embedded Systems

Microprocessors and Microcontrollers are widely used in embedded system products. An embedded system product uses a microprocessor (or Microcontroller) to do one task only. A printer is an example of embedded system since the processor inside it performs one task only; namely getting the data and printing it. Contrast this with a Pentium based PC. A PC can be used for any number of applications such as word processor, print-server, bank teller terminal, Video game, network server, or Internet terminal. Software for a variety of applications can be loaded and run. The reason a pc can perform myriad tasks is that it has RAM memory and an operating system that loads the application software into RAM memory and lets the CPU run it.

In an Embedded system, there is only one application software that is typically burned into ROM. An x86 PC contains or is connected to various embedded products such as keyboard, printer, modem, disk controller, sound card, CD-ROM drives, mouse, and so on. Each one of these peripherals has a Microcontroller inside it that performs only one task. For example, inside every mouse there is a Microcontroller to perform the task of finding the mouse position and sending it to the PC.

[3]

DESCRIPTION

An Embedded System consists of four main components. They are the Processor (Microprocessor or Microcontroller), Memory (RAM and ROM), Peripherals (Input and Output) and Software (main program)

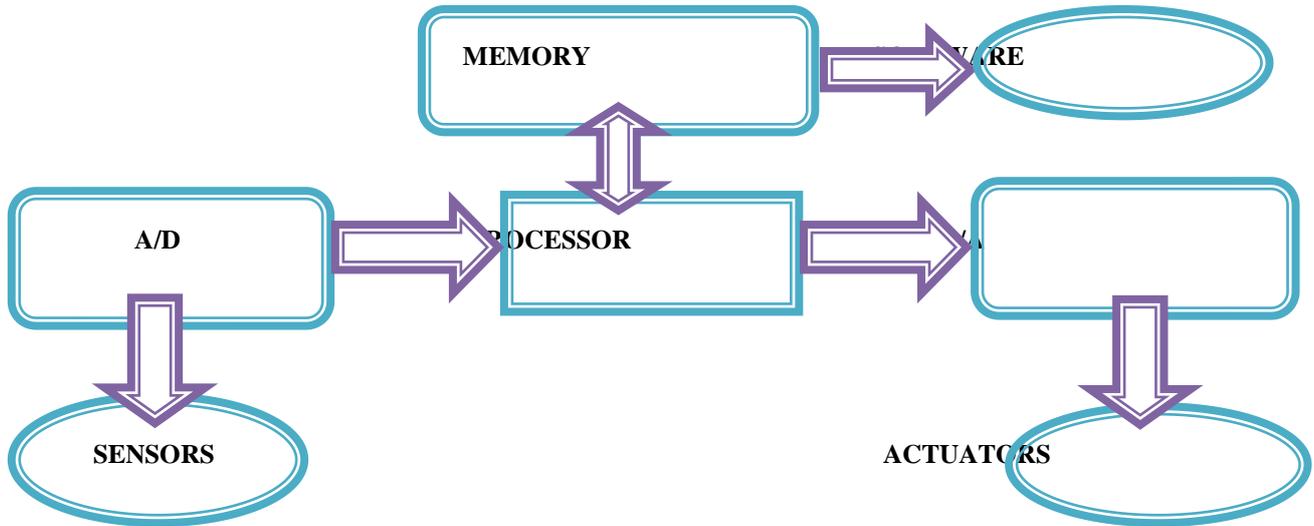


Fig (1) Block diagram of an embedded system:

Parts of Embedded system are:

Processor: The heart of an Embedded System is the Processor. Based on the functionality of the system, the processor can be anything like a General-Purpose Processor, a single purpose processor, an Application Specific Processor, a microcontroller or an FPGA.

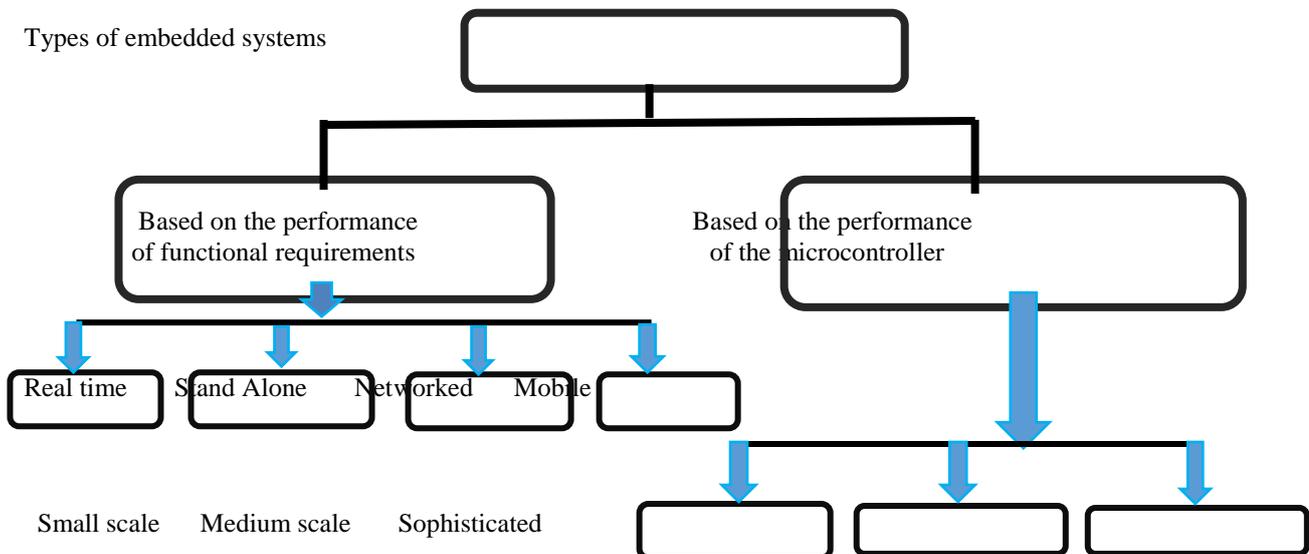
Memory: Memory is another important part of an embedded system. It is divided in to RAM and ROM. Memory in an Embedded System (ROM to be specific) stores the main program and RAM stores the program variables and temporary data.

Peripherals: In order to communicate with the outside world or control the external devices, an Embedded System must have Input and Output Peripherals. Some of these peripherals include Input / Output Ports, Communication Interfaces, Timers and Counters, etc.

Software: All the hardware work according to the software (main program) written. Software part of an Embedded System includes initialization of the system, controlling inputs and outputs, error handling etc.

EMBEDDED SYSTEM CLASSIFICATION

Types of embedded systems



- **Real-time Embedded Systems** – An embedded system that gives an output within a specified amount of time is called a real-time embedded system.

- **Standalone Embedded Systems** – Embedded systems that can work by themselves. In other words, they are self-sufficient, and don't require a host system or computer to function are called standalone embedded systems. Examples include videogame consoles, music players and microwave ovens.
- **Networked Embedded Systems** – Embedded systems that are connected to a network and depend on it for their functioning are called networked embedded systems. They may or may not have smaller or less complex subsystems running to create the network. Examples include home security systems and heat sensor systems.
- **Mobile Embedded Systems**– Embedded systems meant for mobile communications are called mobile embedded systems. They include mobile phones, tablet computers and the like, and are usually categorized by functions like internet, calling, in addition to more complex functions seen in today's smartphones

APPLICATIONS

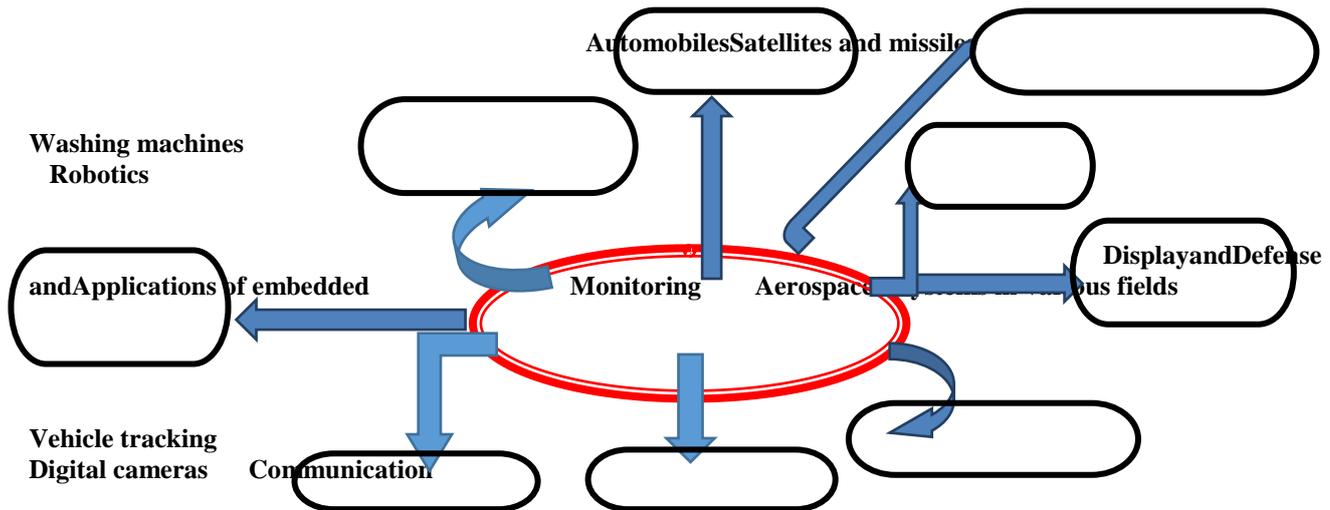


Fig (2) various applications of embedded system in day-to-day life.

EMBEDDED SYSTEMS IN SMART PHONES

Smart phones are the devices that have the greatest chance of becoming a universal remote controls for people to interact with various devices from their surrounding environment. Smart Phones Technology With more than a billion mobile phones being carried around by consumers of all ages, the mobile phone has become the most popular pocket-carried device. We are beginning to see the introduction of Smart Phones, such as Sony Ericsson P800/P900 and Motorola A760 as a result of the convergence of mobile phones and PDA devices. Unlike traditional mobile phones, which have limited processing power and act merely as “dumb” conduits for passing voice or data between the cellular network and end users, Smart Phones combine significant computing power with memory, short-range wireless interfaces (e.g., Bluetooth), Internet connectivity (over GPRS), and various input-output components (e.g., high-resolution color touch screens, digital cameras, and MP3 players). Sony Ericsson P800/P900 runs Symbian OS, an operating system specifically designed for resource constrained devices such as mobile phones. It also comes equipped with two versions of Java technology: Personal Java and J2ME CLDC/MIDP. Additionally, it supports C++ which provides low level access to the operating system and the Bluetooth driver. The phone has 16MB of internal memory and up to 128MB external flash memory. Motorola A760 has a Motorola i250 chip for communication, Intel's 200 MHz PXA262 chip for computation, and 256MB of RAM memory. It runs a version of MontaVista Linux and comes with Java J2ME support. Bluetooth is a low-cost, low-power standard for wireless connectivity. [4]

ADVANTAGES

- Embedded system reduces manual work.
- They are accurate in sensing the variations in input parameters.
- They can be used in any kind of electronic devices in multiple ways.
- They are small in size.
- They are more compatible.
- They can be designed as per the specific requirement or we can change specifications according to our requirement.

CONCLUSION

There is no latest electronic gadget which works without an embedded system in it. Embedded system makes gadgets multifunctional. Example a smart phone with embedded system is used as camera, radio, GPS, DVD, TV, Games, Audio & Video recorder, Calculator, Alarm, Stop Clock etc.

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AN APPROACH TO SECURE MQTT PAYLOAD IN INTERNET OF THINGS USING INVERSE MATRIX CRYPTOGRAPHY

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Abstract: The Internet of Things (IoT) can be defined as a global network which enables monitoring and control of the physical environment by collecting, processing and analyzing the data generated by sensors or smart objects. As the number of smart objects is increasing every day, we are concerned with the security. A smart object compromising on the security can allow attackers to gain control of the device. MQTT (Message Queuing Telemetry Transport) is a publish/subscribe based, light weight messaging, easy to use, internet of things protocol. They allow devices to communicate at a faster rate but provide very few security mechanisms. Security in MQTT can be provided in Network layer by using VPN or secure networks, Transport layer by using TLS/SSL and Application layer by using credentials like username and password. This paper aims at providing secure communications using inverse matrix cryptography method to encrypt payload in application layer.

Keywords: Internet of Things, MQTT, publish, subscribe, inverse matrix cryptography

I. Introduction

The term IoT was coined by Kevin Ashton in his demo in the year 1999 in the context of supply chain management. It was introduced in the field of wireless communications. We embed short range mobile transceivers into an array of gadgets and items that are used daily, a new form of communication between people and things and between things themselves was enabled. The phrase Internet of Things come from two words i.e., the first word Internet and the second word Things. The Internet is a network of networks that consists of millions of private, public, academic and so-on linked by collection of electronic, wireless and optical networking technologies [3]. It uses the TCP/IP protocols for communication between networks. The Things can be any object or person which exists and is distinguishable from other in the real world. The objects need not be electronic devices or technical products but it can be like food, clothing, furniture, land marks etc. It can be both living and non-living things. IoT is also known as Machine to Machine communication. Many protocols are designed for such communication. MQTT protocol is a publish/subscribe protocol is faster and light weight messaging. It has minimal packet overhead, and is preferred over other protocols and traditional client/server exchanges. It is an IoT connectivity protocol. MQTT uses TCP for communications. TCP/IP's port 1883 and 8883 is registered, for using MQTT and MQTT over SSL respectively.

II. MQTT Protocol

Internet of Things is actually a communication between machine to machine or human to machine. Message transmission is necessary as IoT device has to deliver an instruction to another device to manage the system [5]. Push protocol is suitable for message communication protocol for IoT devices as it is constructed in poor bandwidth network. MQTT (Message Queue Telemetry Transport) is implemented through these push message services. This protocol is intended to work on low-power machines as a light-weight protocol.

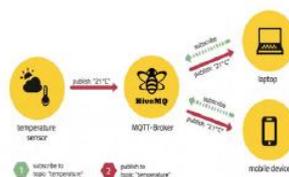


Fig-1: MQTT Protocol

The word Telemetry in MQTT is Tele-metering which means remote measurement. MQ originated from message queuing architecture used by IBM for service oriented networks. There is no queuing in MQTT. Telemetry data goes from devices to a server or broker. It uses publish/ subscribe mechanism. Some of the applications include Facebook messenger to minimize battery usage. Other applications could be medical, environmental applications

MQTT is a standardized publish/subscribe Push protocol that was released by IBM in 1999. For communication it exchanges a range of control packets [6]. Each one contains three parts as illustrated in Figure 2.

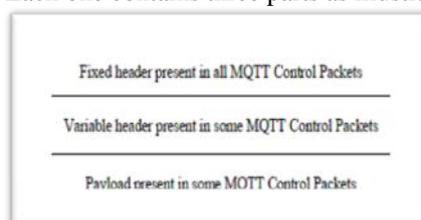


Fig-2: Common Control Packet Format

A. Basic Concepts of MQTT

• *Publish/Subscribe:* In MQTT protocol, publishing messages and users subscribing to topics are considered as Publish/Subscribe model [7]. Subscriber subscribes to a particular topics which relate to them and by that receive every messages are published to those topics. [12]. on other hand, clients can publish messages to topics, in such a way that allow all subscribers to access messages of those topics.

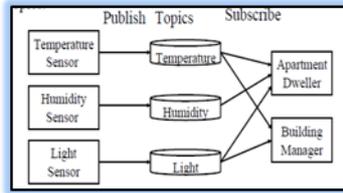
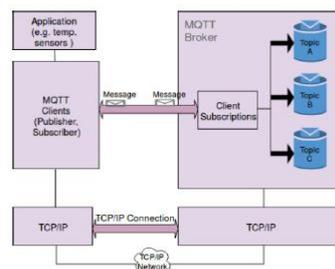


Fig-3 showing Publish/Subscribe model

- *Topics and Subscriptions:* In MQTT, publisher publishes messages to topics that can be considered as message subject. Subscriber subscribe to topics to get specific messages. The subscriptions of topics can be express, that restricts the data which are collect to the particular topic [14]. Topics can contain two wildcard levels, to get data for a range of related topics.
- *Quality of service levels:* This protocol describes the Quality of Service (QoS) levels that are a deal within two parties of a message with respect to the assurance of distribution of data [11]. It supports three levels of Quality of Services described below:
 - QoS- level 0: Also known as fire and forget. The message is sent at most once and it does not provide guarantee delivery of message.
 - QoS- level 1: delivery at least once. In these Quality levels of service, the data is sent at least once and it is possible to deliver a message more than once by setting the value of duplicate flag by 1.
 - QoS- level 2: In these Quality levels of service, the message is sent exactly once by using 4-way handshaking. The selection of the QoS level depends on the system like if a system needs constant data delivery, adapts QoS2 for transmission of data even if there is a time delay [9].
- *Retained messages:* In MQTT, the messages are retained in the broker after distributing it to all present clients. Suppose when another membership is gotten for an identical subject, then retained messages of those topics are transmitted to the new customer [7].
- *Topic Trees:* In MQTT, topics are hierarchical, like a filing system (eg. Kitchen/oven/temperature). Wildcards are allowed when registering a subscription but not when publishing allowing whole hierarchies to be observed by clients. The wildcard + matches single directory name. # matches any number of directories of any name. For example, the topic kitchen+/temperature matches kitchen/foo/temperature but not kitchen/foo/bar/temperature whereas kitchen# matches kitchen/fridge/compressor/temperature.
- *Last wills and Testament:* MQTT clients can register a custom “last will and testament” message to be sent by the broker if they disconnect. These messages can be used to signal to subscribers when a device disconnects.
- *Persistence:* MQTT has a support for persistent messages stored on the broker. When publishing messages, clients may request that the broker persists the message. Only the most recent persistent message is stored. When a client subscribes to a topic, any persisted message will be sent to the client. MQTT brokers do not allow persisted messages to back up inside the server.
- *Security:* MQTT brokers may require username and password authentication from clients to connect. To ensure privacy, the TCP connection may be encrypted with SSL/TLS.

III. MQTT Architecture

MQTT has a client/server model, where every sensor is a client and connects to server known as broker, over the TCP. MQTT is message oriented. Every message is a discrete chunk of data, opaque to broker. Every message is published to an address known as a topic. Clients may subscribe to multiple topics. Every client subscribed to a topic receives every message published to the topic. MQTT architecture can be divided into two main components as shown in the Figure 4.



interested clients. Each message typically has a payload which contains the actual data to transmit in byte format. MQTT is data-agnostic and it totally depends on the use case how the payload is structured. It's completely up to the sender if it wants to send binary data, textual data or even full-fledged XML or JSON. The figure shows the MQTT payload containing textual data as "temperature 32.5".



Fig 6 : MQTT PUBLISH PACKET

Encryption can be done using two mechanisms: Public and private key encryption, also called as asymmetric encryption and the secret key encryption, also called as symmetric key encryption.

Public and private key encryption uses two keys for encryption and decryption. Public key is used for encryption. And private key is used for decryption. This provides authentication and confidentiality to the payload published. The public key is announced to all the other clients but the private key is kept confidentially with the client. Decryption cannot be done with the known public key; client interested in the payload should have the private key for decryption. Only trusted clients can be shared with the private key. This ensures that no other client other than the original user is decrypting the payload. In the End-to-End encryption, the encrypted data stays encrypted all the time. While the MQTT broker uses the unencrypted packet metadata for e.g. routing and quality of service handling, the application data itself stays encrypted and the broker has no way to look into the encrypted data. Only trusted clients have access to the key to decrypting the data again.

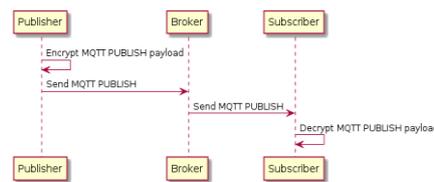


Fig 7 : E2E(End-to-End) Encryption

Advantages / Disadvantages of Payload encryption

Advantages:

- A completely secure end-to-end encryption of application data can be achieved
- Works well on constrained devices where no TLS can be used.
- Adds another layer of security for topics which are used for delivering confidential information

Disadvantages:

- Encryption / decryption can be resource intensive on constrained devices
- A secure provisioning of the keys to the MQTT clients must be implemented.
- Doesn't prevent from man-in-the-middle attacks and replay attacks.

Here we encrypt the payload using Inverse matrix method. Depending on the encryption mechanism used, the same key might be used for both encryption and decryption, while for other mechanisms, the keys used for encryption and decryption might be different.

Steps for encryption and decryption

- We perform a mapping for each alphabet or number or special character with a code.
- We write the text to be coded and write the corresponding codes.
- Take two codes at a time and write it down vertically.
- If we are left with only one character, then we substitute the next character with space.
- Take an encoding matrix say n*n matrix.
- Perform matrix multiplication as:
E (n*n) X M (n*m) where column of first matrix must be same as the row of the first matrix.
- We get an encoded matrix.
- During decryption, we multiply the encoded matrix with inverse of E (E⁻¹) to get the message again.

The alphabets (a-z) are given numerals as 1-26, dot(.) as 27, numbers 1-9 and 0 as 28-37 and space as 38.

Consider an example to encode the payload message as: "temperature 36.5"

Let A be the encoded matrix as :

$$A = \begin{bmatrix} 3 & 5 \\ 1 & 2 \end{bmatrix}$$

$$\left(\begin{array}{ccccccccc} t & e & m & p & e & r & a & t & u & r & e & & 3 & 6 & . & 5 \\ 20 & 5 & 13 & 16 & 5 & 18 & 1 & 20 & 21 & 18 & 5 & 38 & 30 & 33 & 27 & 32 \end{array} \right)$$

Now write it in matrix form as M (message):

$$\begin{bmatrix} 20 & 13 & 5 & 1 & 21 & 5 & 30 & 27 \\ 5 & 16 & 18 & 20 & 18 & 38 & 33 & 32 \end{bmatrix}$$

And perform A (2x2) and M (2x 8) and the resultant is 2 x 8 matrix.

$$\begin{bmatrix} 85 & 119 & 105 & 103 & 153 & 205 & 255 & 241 \\ 30 & 45 & 41 & 41 & 57 & 81 & 96 & 91 \end{bmatrix} \text{ Now we do } A^{-1} \text{ as}$$

$$A^{-1} = 1/\det A \begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$$

$$\text{Therefore we have } A^{-1} \text{ as } \begin{bmatrix} 2 & -5 \\ -1 & 3 \end{bmatrix}$$

Now to decrypt the text as: $M = A^{-1} X E$

We get the result as:

$$\begin{bmatrix} 20 & 13 & 5 & 1 & 21 & 5 & 30 & 27 \\ 5 & 16 & 18 & 20 & 18 & 38 & 33 & 32 \end{bmatrix}$$

And we read column wise to get the message.

V. CONCLUSION

Inverse matrix method is applied for the payload text data and works well for encryption and decryption. This method can be further enhanced to apply encryption methods between client and the broker rather than making it end to end. Broker can decrypt the message and send to the subscribers. Client can use both the payload encryption and transport layer TLS encryption in conjunction for higher level of security as payload encryption still has the threat of man in middle attack and message replay.

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“INTERNET OF THINGS(IOT) FOR SMART HOUSE”

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Abstract-Internet Of Things (IoT) represents a general concept of the ability of network devices to sense and collect data from around the world, and share that data across the Internet where it can be processed and utilized for the various interesting purpose. This paper tells about that how the technology of the IoT used for the construction of the smart house. The basic technology of the sensors for the smart house is also elaborated in this paper. A temperature sensor that work on the Linux environment of the single board minicomputer is developed.

1. INTRODUCTION

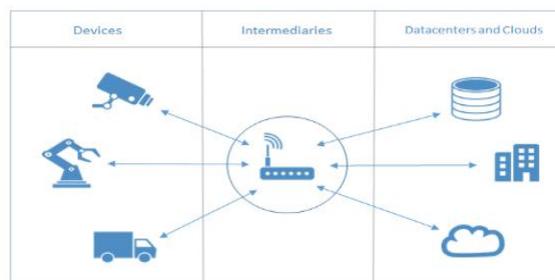
The IoT comprised of smart machines which are interacting and communicating with other machines, objects, environment and infrastructure. Now a day’s every person is connected with each other using lots of communication way. Where most of the popular communication way is internet so in another word we can say internet is the way which connects the people. The main idea of the Internet Of Things (IoT) has been around for nearly two decades, and has attracted many researchers and industries because of it’s great estimated impact improving our daily lives and society.

“Smart House”, a house which is fully accomplished with the smart devices based on the IoT technology. These devices are nothing but the electronic devices like mobile phones, different type of sensors, computers, tablets, music system, smart T.V., home appliances, lights and over all electronic devices. These all things are connected to each other and there is a central node where these all things are connected to the cloud.

An application of smart house allows the main door of the house to be fully electronic and automated which detect the face of the member of the house and unlock it. On the other side when some intruder wants to access or get into your house then the face detector or the camera that attached on the door will establishes the connection to the mobile handset of every member of the house then according to them like if they know them they give the access permission and unlock the house gate and get them to get into the house. Another application is that if the hall or any room is occupied then on the basis of this the smart light sensor going to sense it and if the room is occupied then it remain the light on or if it is not occupied then it automatically off the light of the house. The technology behind these is Internet of Things.

2. TECHNOLOGY

Technology of IoT: IoT is mainly based on the things like computers, mobile devices, sensors and servers. The IoT refers to all unconventional electronic devices that exchange data via the Internet using a local or wireless network. It can be a consumer like electronic fitness trackers, home appliances like web cameras, voice assistants, refrigerators, coffee makers or washing machines. The main principle of the IoT means that everything that can be connected to each other. Figure 1 shows the architecture of the IoT, which usually gives you the clear picture about the IoT.



Basic IoT Architecture

Figure 1 : Architecture of the IoT technology

Smart house technology: The concept of the smart house is based on the theory of the IoT technology totally. A smart house is a house which is fully occupied with the electronic devices or gadgets. The house is fully automated. It involves the control and automation of lighting, heating, ventilation, air conditioning and security as well as home appliances such as washer/dryers, ovens or refrigerators or freezers. Wi-Fi is often used for remote monitoring and control.



Figure 2: Smart house technology

Home device is the individual unit and important constituent of the smart house remotely controlled and monitored via internet. All these systems generally consist of the switches and sensors connected to a central hub called the “gateway” from which the system is controlled with a user interface that is interacted either with a wall mounted terminal, mobile phone software, tablet computer or web interface often via internet cloud services.

Enabling technology: There are three types of technologies that enable the internet of things,

- I. Near-field communication (NFC) and Radio Frequency Identification (RFID) -In the 2000s, RFID was the dominant (NFC). NFC have become common in smart phones during the early 2010s, with uses such as reading NFC tags or for access to public transportation.
- II. Quick response codes and Optical tags – This is used for low cost tagging. Phone cameras decodes QR code using image-processing techniques. In reality QR advertisement campaigns gives less aurnout as users need to have another application to read QR codes.
- III. Bluetooth and low energy – this is one of the latest technique. All newly releasing smartphones have BLE presence at a power budget that enables them to operate for up to one year on a lithium coin cell battery.

3. RELATED WORK

Smart house is one of the greatest initiative project in the field of the internet of things. The project of the smart house going to make the one’s individual life very easy and convenient. The smart house come into the existence after the technology of “internet of things” coined [1]. Smart house leads to the automation of every individual unit of the house [2]. The IoT is intelligently connected devices and system to gathered data from connected devices and sensors and other physical electronic things. IoT is a technique which is going to be spread very fast into the coming world. The technology of smart house will change the one individual’s life in different aspects. The base of the smart house is totally dependent on the technology of the IoT which is clearly defined in the literature [3].

The author in [14] describes the concept of sensor networks which has been made viable by the convergence of microelectron-mechanical, in literature [5], system technology, wireless communications. Firstly the sensor network applications and sensing task are explored, and according to that the review factors influencing the design of sensor network is provided. Then the algorithms and protocols, network protocol in literature in [4], developed for each layer and the communication architecture for sensor network is outlined. As all devices i.e. electronic devices, mobile phones, different computers, tablets, sensors, etc, of the smart is connected together follows the above mentioned concept of the technology.

The smart house concept is not complete without the technology of the cloud computing. In literature [6] the idea of the cloud computing is elaborated. As smart house produce and consumes a huge amount of data and it has to process these data accordingly. It continuously in contact with the cloud in order to process the raw data, take the data as the inputs from the processed data and also give the output according to the them.

The Electronic Information Desk System [7] is one of the pillar of the smart house, it uses the SMS based approach in different ways. The system is designed to work independently without the involvement of the humans and when a family member needs an information, they will need to send an SMS to this system which will respond with the information required by the user.

In [8] there is a link which gives an example of the smart house or the home automation system which is developed by the owner of the facebook Mark Zuckerberg. It is very closely common to the Amazon’s Alexa, it is activated by voice and able to control the house hold devices like the window kurtons, lights, fans, AC’s etc. Jarvis is actually a system that work on the base of the IoT and makes possible the idea of the smart house, as the Jarvis developed by the Mark from your morning to go the bed it makes everything very easy for you. When you wake in the morning it gives you the morning greeting and tells you about the temperature outside so you can go for the walk accordingly. Now come on the breakfast only you have to put the bread in the toaster and afterwards the Jarvis will remind you that the toaster is ready to eat. Jarvis has also the face recognition that it recognize the face and match it from your database and tells you that some is looking for you and it on up to you to let them come or not if you know them you have to give command to Jarvis to unlock the door and let them come inside.

The face recognition is totally based on the concept of the image processing. In reference [9] the concept of the image process is reveled. In the system Jarvis the it is programmed in such a way that it processes the image from the input devices like camera and all and it processes the image and accordingly it compares and tells that the particular person with their name all detail it shows on your mobile screen and tells you that it looking for you. After Jarvis is that much smart that it also tells the relation with them like it tells that your dad, your mother, your brother is looking for you, so Jarvis is very smart system which already has installed in the house of Allen Mark Zuckerberg.

Jarvis is programmed in such a way that you can also communicate with it with the help of text messenger also, like you have to text in that user interface in your mobile which is communicating to the Jarvis that “lights off” then it suddenly switch off the light. The another initiative towards the area of the smart house is the “Alexa” which is developed by the amazon. It is the combination of the devices having microphone and speakers. The Alexa is on actually a

programmed system which is present on the cloud which helps you to do make your house hold activities more easier and convenient. Alexa is voice assistant technology which is connected to devices of your house and to the amazon's cloud [10][11]. One can command the Alexa and it can do work for you like it can do online shopping for you, switch off the light of the particular room or kitchen or many more house hold works for you.



Figure 3 : Alexa by amazon

Like this type of the devices make dream comes true of the smart house based on the technology of the “Internet Of Things”.

Advantages:

- Managing all your home devices from one place. The convenience factor here is enormous. Being able to keep all of the technology in your home connected through one interface is a massive step forward for technology and home management.
- Flexibility for new devices and appliances. Smart home systems tend to be wonderfully flexible when it comes to the accommodation of new devices and appliances and other technology.
- Maximizing home security. There are tons of options here, only a few dozen of which are currently being explored. For example, home automation system can connect motion detectors, surveillance cameras, automated door locks, and other tangible security measures throughout your home so you can activate them from one mobile device before heading to bed.
- Remote control of the home functions. Don't underestimate the power of being able to control your home's functions for a distance. Like on an exceptionally hot day, you can order your house to become cooler in just enough time before you get home from work.
- Increased energy efficiency. Depending on how you use smart-house technology, it is possible to make your space more energy-efficient.
- Improved appliance functionality. Smart homes can also help you run your appliance better. Like a smart tv help you to find better apps and channels to locate your favorite programming. A smart oven will assist you with cooking your chicken to perfection without ever worrying about overcooking or undercooking it. An intelligently designed home theatre and audio system do manage your movie or music collection effortless when entertaining guests.
- Home management insights. There is also something to be said for your ability to tap into insights on how your home operates. You can monitor how often you watch TV and what is watch, what kind of meals you cook in your oven, the type of food you keep in your refrigerator, and your energy consumption habits over time. From these insights, you may able to analyze your daily habits and behaviors, and make adjustments to live the lifestyle you desire.

Disadvantage:

- Cost, most of the families are able to purchase smart house products, but that doesn't mean it won't leave a dent in your wallet. You can purchase the products one at a time and it won't seem like too much but by the time you have the smart house system you want, you will likely have spent a larger sum than you would have if you had purchase non-smart product.
- Reliability, a smart home will be extremely reliant on your internet connection. If your connection drops you will be left with a lot of smart products that won't work. Additionally, wireless signals can possibly be interrupted by other electronics in your home and cause some of your smart products to function slowly or not at all.
- The lack of standardization and use of proprietary technology can cause problems for those automating their homes. A customer could invest in an entire system of a company that fails.
- Video surveillance, it can be wonderful tool in heightening security and deterring crime, but technology falls into the wrong hands, issues of privacy can occur. Security sensor within the doors and walls of a smart house use wireless technology to transfer signals to a central control unit that notifies emergency officials of any foreign activity. Video surveillance feeds are also transferred wirelessly to a part of the home that can be monitored. If the security feeds from the video and sensor fall into the wrong hands, your smart home could be monitored by those who have managed to hack it.

4. SUGGESTED WORK

The base of the smart house is completely falls into the area of the information technology [3] and the concepts of the sensors [14]. The system for sensing the temperature is developed on a single board computer called “Raspberry Pi”. Raspberry Pi is a single board computer which is developed in the United Kingdom by the Raspberry Pi foundation [12]. The system is implemented using the java programming language. The application is programmed in such a way that it senses the temperature and accordingly find the humidity and sends these information to some registered e-mail id’s [13].

The temperature sensor is one of the individual working unit of the smart house. The goal of the temperature sensor is to sense the temperature of the surrounding area and accordingly calculate the humidity level and send the information to the registered users.

The process involves the following steps.

- The environment (Figure 4) and the connections of the Raspberry Pi single boarded computer to the user interface (Figure 5 & 6) is set up.
- On the user interface of the Raspberry Pi the code to get the temperature and humidity is written.
- Then the code is executed on the user interface of the Raspberry Pi.
- The sensors of the Raspberry Pi then senses the temperature and calculate the humidity.



Figure 4 : Raspberry Pi single board computer



Figure 5 : Raspberry Pi connection to the computer

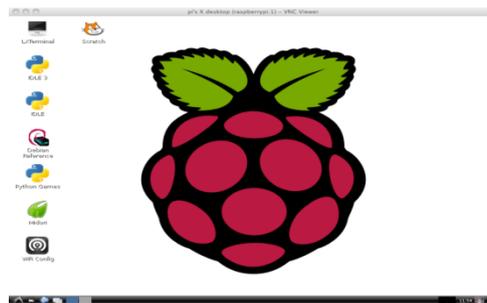


Figure 6 : Raspberry Pi user interface on the computer

5. APPLICATION

To make the one individual life easier and convenient the application of the “Internet of the things” system has been designed. the application of this system in smart house (in this the home automation and smart house is the individual unit of it) is listed below;

- Senses the temperature of the environment of the house and accordingly sends the report.
- Support for the temperature control system.
- Detect Andriod devices, iPhones and in general any device which works with Bluetooth interfaces or WiFi.
- Measurement of energy radiated by cell stations and WiFi routers.
- Monitoring of the vehicles and pedestrian level to optimize driving and walking routes.
- Detection of rubbish level in containers to optimize trash collection routes.
- Heating, ventilation and air conditioning.
- Lighting control system.

- Occupancy-aware control system.
- Appliance control system.
- Security systems.
- Leak detection, smoke and CO detectors.
- Indoor positioning system.
- Home automation for the elderly and disabled

6. CONCLUSION

The IoT and the IT based technology of the smart house is developed to deliver a step change in the individuals quality of life. The smart sensors like the temperature sensors controls the temperature of the house according to the outer environment. It makes the one's life more easier and convenient than before. It reduces the human effort and saves the energy and time too. Smart house is like revolution in this area, which makes houses more secure than before.

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THE ROLE OF STATISTICS IN BIG DATA ANALYTICS

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ABSTRACT

The characteristic of the data that comes in our mind while thinking about big data is the size.

The term big data means that the data is large and complex which cannot be processed traditionally. The world is now experiencing a proliferation of big data whose volume, variety and velocity continue to reach unprecedented levels. Big data plays an important role in improving the accuracy, timeliness and relevance of economical statistics at a lower cost than expanding existing data collections. Processing and analyzing data have influenced how decisions are made as their accuracy can affect the results variably. Big data is a new driver of the world economic and societal changes. Dealing with big data raises many challenges. Analysing of big data is very difficult but by applying statistical fundamentals, makes easy to analyse and interpret. This paper tells about the characteristics, challenges and the applications of big data in various fields. This paper also describes the importance of statistics in Big Data Analytics.

Key Words : Big data, Structured & Unstructured data, Statistics, Data Analytics.

1. INTRODUCTION

Possibly we are producing data every day, from birth to death. Technological advances enable us to collect more and more data. Rather than Gigabytes and Terabytes, nowadays, the data produced are estimated by zettabytes, and are growing every day. Already in 2012 it was estimated that data collection was growing at 50% per year. Starting from 2014, Google began collecting genetic and molecular information from thousands of healthy volunteers, in an attempt to allow medical experts to predict the onset of diseases such as heart disease and cancer. The company Evolv extracted millions of applicant data from job openings in hundreds of the world's largest companies with an aim to find suitable talents for such organizations. [1]

1.1. Sources of data

- The data volumes are exploding; more data has been created in the past two years than in the entire previous history of the human race.
- 4.4 Zeta bytes of data exist in the digital universe today.
- Every second we create new data by performing 40,000 search queries every second (on Google alone), which makes it 3.5 searches per day and 1.2 trillion searches per year.
- Facebook users send on average 31.25 million messages and view 2.77 million videos every minute.
- We are seeing a massive growth in video and photo data, where every minute up to 300 hours of video are uploaded to YouTube alone.
- Data is growing faster than ever before and by the year 2020; about 1.7 megabytes of new information will be created every second for every human being on the planet.
- IOT technology enables the network devices to sense and collect data.
- The other major sources of big data are media, business applications, public web, social media, data storage, sensor data and mobile devices.

1.2 Big Data

At present there is no specific definition of big data. Research analysts have presented two definitions for big data. The first one is "a collection of data with complexity, heterogeneity and high potential value that are difficult to process and analyze in a reasonable time". Second one is "a new type of strategic resource in the digital era and the key factor to drive innovation, which is changing the way of human current production and living".

Data types involved in big data are many. The main types are

- Structured data
- Unstructured data
- Semi-Structured data

This includes geographic, real-time media, natural language, time series, event, network and link and other types.

1.2.1. Structured data

Any data that can be stored, accessed and processed in the form of fixed format is termed as a 'structured' data. Over the period of time, talent in computer science have achieved greater success in developing techniques for working with such kind of data (where the format is well known in advance) and also deriving value out of it.

Employee_ID	Employee_Name	Gender	Department	Salary_In_Lacs
2365	Rajesh Kulkarni	Male	Finance	650000
3398	Pratibha Joshi	Female	Admin	650000
7465	Shushil Roy	Male	Admin	500000
7500	Shubhojit Das	Male	Finance	500000
7699	Priya Sane	Female	Finance	550000

Fig 1: Structured Data

1.2.2. Unstructured data

Any data with unknown form or structure is classified as unstructured data. In addition to the size being huge, unstructured data poses multiple challenges in terms of its processing for deriving value out of it. Typical example of unstructured data is, a heterogeneous data source containing a combination of simple text files, images, videos etc. Today’s organizations have wealth of data available with them but unfortunately they don’t know how to derive value out of it since this data is in its raw form or unstructured format.

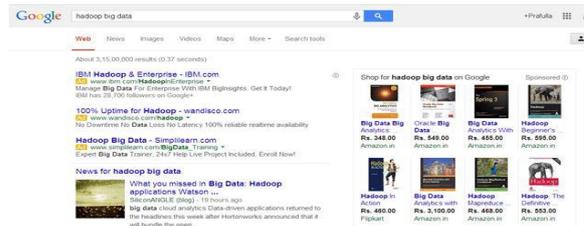


Fig 2: Unstructured Data

1.2.3. Semi-Structured data

Semi-structured data can contain both the forms of data. It is the data in a structured form which is not defined. E.g. a table definition in relational DBMS. Another example of semi-structured data is a data represented in XML file.

```
<rec><name>Prashant Rao</name><sex>Male</sex><age>35</age></rec>
<rec><name>Seema R.</name><sex>Female</sex><age>41</age></rec>
<rec><name>Satish Mane</name><sex>Male</sex><age>29</age></rec>
<rec><name>Subrato Roy</name><sex>Male</sex><age>26</age></rec>
<rec><name>Jeremiah J.</name><sex>Male</sex><age>35</age></rec>
```

Fig 3: Semi-Structured Data

CHARACTERISTICS

The difficulty of transforming big data into knowledge is related to its complexity, the essence of which is broadly captured by the “V’s” of big data.

Big data can be describe by the following characteristics

(i) Volume – The size of data plays very crucial role in determining value out of data. Also, whether a particular data can actually be considered as a Big Data or not, is dependent upon volume of data. Hence, volume is one characteristic which needs to be considered while dealing with 'Big Data'. Data preparation and cleaning are a very important step of exploratory data analysis that becomes significantly more challenging with increasing size of the data.

(ii) Variety – The next aspect of 'Big Data' is its variety. Variety refers to heterogeneous sources and the nature of data, both structured and unstructured. During earlier days, spreadsheets and databases were the only sources of data considered by most of the applications. Now days, data in the form of emails, photos, videos, monitoring devices, PDFs, audio, etc. is also being considered in the analysis applications. This variety of unstructured data poses certain issues for storage, mining and analyzing data.

Some examples of new types of data that don't fit into rectangular model are images- both two- and three-dimensional, blog posts, twitter feeds, social networks, audio recordings, sensor networks, videos. For many types of big data the number of variables is larger, often much larger, than the number of observations.

(iii) Velocity – The term 'velocity' refers to the speed of generation of data. How fast the data is generated and processed to meet the demands, determines real potential in the data. Big data velocity deals with the speed at which data flows in from sources like business processes, application logs, networks and social media sites, sensors, mobile devices, etc. The flow of data is massive and continuous.

In many areas of application, data is arriving at a high velocity, from continuously operating instrumentation, such as autonomous driving vehicles or through an on-line streaming service. For some applications, such as high energy physics, bursts of data arrive so rapidly that it is infeasible to even record all of it. In this case a great deal of scientific expertise is needed to ensure that the data retained is relevant to the problem of interest.

The other V's of big data are

- **Variability** – This refers to the inconsistency which can be shown by the data at times, thus hampering the process of being able to handle and manage the data effectively.
- **Veracity**-Big Data veracity refers to the biases, noise and abnormality in data. Veracity in data analysis is the biggest challenge. A strategy to help keep the data clean and process to keep ‘dirty data’ from accumulating in systems need to be devised.
- **Validity**- Validity is checking the data for quality, governance, master data management (MDM) on massive, diverse, distributed, heterogeneous, “unclean” data collections.
- **Value**- The all-important V, characterizing the business value, and potential of big data to transform your organization to a different level from top to bottom
- **Venue**- Distributed heterogeneous data from multiple platforms, from different owners’ systems, with different access and formatting requirements, private vs. public cloud.
- **Vocabulary**- The schema, data models, semantics, taxonomies, and other content- and context-based metadata that describe the data’s structure, syntax, content, and provenance.
- **Volatility**

Big data volatility refers to how long is data valid and how long should it be stored. In this world of real time data one need to determine at what point is data no longer relevant to the current analysis.

- **Vagueness**- Confusion over the meaning of big data and the tools used.



Fig 4: The V's of Big Data

CHALLENGES

The major challenges of big data are

Data quality

Data quality is not a new concern, but the ability to store every piece of data a business produces in its original form compounds the problem. Dirty data costs companies in the United States \$600 billion every year. Common causes of dirty data that must be addressed include user input errors, duplicate data and incorrect data linking. In addition to being meticulous at maintaining and cleaning data, big data algorithms can also be used to help clean data.

Scalability

With big data, it's crucial to be able to scale up and down on-demand. Many organizations fail to take into account how quickly a big data project can grow and evolve. Constantly pausing a project to add additional resources cuts into time for data analysis. Big data workloads also tend to be bursty, making it difficult to predict where resources should be allocated. The extent of this big data challenge varies by solution. A solution in the cloud will scale much easier and faster than an on-premises solution.

Actionable insight

Having more data doesn't necessarily lead to actionable insights. A key challenge for data science teams is to identify a clear business objective and the appropriate data sources to collect and analyze to meet that objective. The challenge doesn't stop there, however. Once key patterns have been identified, businesses must be prepared to act and make necessary changes in order to derive business value from them.

Security

Keeping that vast lake of data secure is another big data challenge. Security challenges include user authentication for every team and team member accessing the data, restricting access based on a user's need, recording data access histories and meeting other compliance regulations, proper use of encryption on data in-transit and at rest.

Cost management

It's difficult to project the cost of a big data project, and given how quickly they scale, can quickly eat up resources. The challenge lies in taking into account all costs of the project from acquiring new hardware, to paying a cloud provider, to hiring additional personnel. Businesses pursuing on-premises projects must remember the cost of training, maintenance and expansion. Big data in the cloud projects must carefully evaluate the service-level agreement with the provider to determine how usage will be billed to the users.

Beyond the technical complexities of managing data, the other challenge is getting the team of data scientists who can access the data and prepare the data for analysis using computational tools, building statistical models for analysing data, visualizing and interpreting the meaning of the available data.

ROLE OF STATISTICS IN BIGDATA

Statistics is the science of studying uncertainty and learning from data. The American Statistical Association defines statistics as “the science of learning from data, and of measuring, controlling, and communicating uncertainty.” Statistics is considered to be one of the three primary pillars of the field of data science. Computer science skills help to get access to the relevant data and prepare them for analysis, statistics helps to interrogate that data to provide answers to the questions. Statistics and statistical thinking helps people understand the importance of data collection, analysis, interpretation and reporting of results.

Due to the scale and complexity of data sets currently being collected in areas such as health, transportation, environmental science, engineering, information technology, business and finance, modern quantitative analysts are seeking improved and appropriate computational and statistical methods to explore, model and draw inferences from big data. Approaching complicated and noisy clinical datasets with a mathematical mind can help to support decision-making processes.

99.99% of all data analyses are based on the application of so-called parametric (or other restrictive) statistical models that assume the data-generating distributions have specific forms. The original purpose of a statistics model was to develop a set of realistic assumptions about the probability distribution generating the data set. With high-dimensional data, not only is the correct specification of the parametric model a big challenge, but the complexity of the parametric model also may increase so that there are more unknown parameters than observations.

4.1. Statistical Tools used for Big Data Analytics

With the current obsession over big data, a lot of sophisticated tools and techniques have been developed and are available to large organizations. However, there are fundamental statistical tools that are the building blocks of the data analytics tools.

Mean

The arithmetic mean commonly known as the average is the sum of a list of numbers divided by the number of items on the list. The mean is useful in determining the overall trend of a data set or providing a rapid snapshot of your data and can be calculated easily. When taken alone, the mean is a dangerous tool. In a data set with a high number of outliers or a skewed distribution, the mean simply doesn't provide the accuracy needed for a nuanced decision.

Standard Deviation

The standard deviation is the measure of a spread of data around the mean. A high standard deviation signifies spread of data more widely from the mean, where a low standard deviation signals that more data align with the mean. In a portfolio of data analysis methods, the standard deviation is useful for quickly determining dispersion of data points. Just like the mean, the standard deviation is deceptive if taken alone.

Regression

Regression models the relationships between dependent and explanatory variables, which are usually charted on a scatter plot. The regression line also designates whether those relationships are strong or weak. Sometimes, the outliers on a scatter plot (and the reasons for them) matter significantly.

Sample Size Determination

When measuring a large data set collecting all the information for the data set becomes difficult. A sample does the job just as well. The trick is to determine the right size for a sample to be accurate. The proportion and standard deviation methods helps to accurately determine the right sample size needed to make data collection statistically significant. The proportion equations might need to rely on certain assumptions. However, these assumptions might be completely inaccurate. This error is then passed along to the sample size determination and then onto the rest of statistical data analysis.

Hypothesis Testing

Also commonly called *t* testing, hypothesis testing assesses if a certain premise is actually true for your data set or population. In data analysis and statistics, you consider the result of a hypothesis test *statistically significant* if the results couldn't have happened by random chance. Hypothesis tests are used in everything from science and research to business and economic.

In response to the problems of analyzing large-scale data, quite a few efficient methods [2], such as sampling, density-based approaches, grid-based approaches, data condensation, divide and conquer, incremental learning, and distributed computing, have been used.

The results of these methods illustrate that with the efficient methods at hand, we may be able to analyze the large-scale data in a reasonable time. The dimensional reduction method (e.g., principal components analysis; PCA [3]) is a typical example that is aimed at reducing the input data volume to accelerate the process of data analytics. Another reduction

method that reduces the data computations of data clustering is sampling [4], which can also be used to speed up the computation time of data analytics.

Following are the points to be remembered while generating a statistical tool to analyze big data.

Interactive analysis is the best way to really figure out what is going on in a data set To understand a data set we have to be able to play around with it, explore it and interact with the data quickly. It helps us to make tables, plots, and to identify quirks, outliers, missing data patterns and problems with the data. One way to do this is to analyze the whole data set at once using tools like Hive, Hadoop, or Pig. But an often easier, better, and more cost effective approach is to use random sampling. As Robert Gentleman put it “make big data as small as possible as quick as possible”.[6]

When testing many hypotheses, correct for multiple testing This points out the problem with standard hypothesis testing when many tests are performed. Classic hypothesis tests are designed to call a set of data significant 5% of the time, even when the null is true (e.g. nothing is going on). One really common choice for correcting for multiple testing is to use the false discovery rate to control the rate at which things you call significant are false discoveries. People like this measure because you can think of it as the rate of noise among the signals you have discovered. Benjamini and Hochber gave the first definition of the false discovery rate and provided a procedure to control the FDR [6].

Know what your real sample size is. It can be easy to be tricked by the size of a data set. Consider an image of a simple black circle on a white background stored as pixels. As the resolution increases the size of the data increases, but the amount of information may not. Similarly in genomics, the number of reads you measure (which is a main determinant of data size) is not the sample size, it is the number of individuals. In social networks, the number of people in the network may not be the sample size. In general the bigger the sample size the better and sample size and data size aren't always tightly correlated.

More advanced computational and statistical methodologies for analyzing big data must be developed. Experimental design methodologies are to be described and should be implemented to make the analysis of big data more computationally tractable.

APPLICATIONS

Big data in HealthCare

Big data is used for analyzing data in the electronic medical record (EMR) system with the goal of reducing costs and improving patient care. Big data is also being used for syndromic surveillance, the monitoring of the syndromes of transmittable diseases at the population level. This Data includes the unstructured data from physician notes, pathology reports etc. Big Data and healthcare analytics have the power to predict, prevent & cure diseases.

In the province of Quebec, a central system monitors the triage data from emergency rooms including free form text which needs to be treated appropriately. When the automated surveillance system issues an alert, an ad-hoc analysis is performed to decide whether immediate actions are needed. Buckeridge et al. [5] evaluate the performance of such systems through simulation for different rates of false positive alerts.

Personalized Recommendations

The application aims to incorporate knowledge of how people rate products such as movies, books, and healthcare services to help large companies like Netflix (movie-rental Company), for Amazon and government to create tailored made recommendations/services for individuals. Consider the Netflix data set containing 17,770 movies made by 480,189 customers who have rated the movies on a scale from 1(worst) to 5(best). See Table 1 for an excerpt of the Netflix movie rating data. It can be seen that not all movies are rated by every customer. In fact, only 1% of the ratings are available in the data. Such big data set poses several research problems including data visualization, dimensional reduction and clustering. The application predicts the ratings for unrated movies, to better recommend movies to customers. Such problem has been formulated in different approaches such as sparse matrix approximation, penalized singular value decomposition, probabilistic matrix factorization, rank aggregation.

Social Media and Network

Nowadays, various social media platforms such as Facebook, Twitter and Instagram are getting huge worldwide penetration. According to a study in 2013, people spent more than 27% of internet time on social networking [7]. Some users may be more influential in a social network in the sense that they tend to post more messages than the others. As these messages are mainly text documents, various text mining and computational linguistics tools such as statistical natural language processing, content categorization, etc., are essential methods of quantifying and analyzing textual data. The popular use of social media platforms attracts a lot of attention in many areas including product advertisement, sentiment analysis and election prediction. Given the social communication activities made among the users the analytical tools helps analyzing that data to make business decisions. The most common use of social media analytics is to mine customer sentiment to support marketing and customer service activities.

Image Recognition and Labelling

Images are unstructured data and their analysis progressed significantly with the development of deep learning models such as deep Boltzmann machines that are especially suitable for automatically learning features in the data. The image search engine of Google also uses deep learning models to find images that are similar to an uploaded picture.

Store Operations

Different tools can be used to monitor store operations which reduce manual work. Big data helps in adjusting inventory levels on the basis of predicted buying patterns, study of demographics, weather, key events, and other factors.

Human Resource

Big Data has changed way of recruitment and other HR operations. It helps to find out the characteristics and behaviors of successful and effective employees, as well as other employee insights to manage talent better.

Banking

Big Data has provided biggest opportunity to companies like Citi bank to see the big picture due to balancing the sensitive nature of the data for delivering value to clients along with prioritizing the privacy and protection of information. It has been fully adopted by many companies to drive business growth and enhance the services they provide to customers.

Finance sector

Financial services have widely adopted big data analytics to inform better investment decisions with consistent returns. The big data pendulum for financial services has swung from passing fad to large deployments last year.

Retail sector

Retailers harness Big Data to offer consumers personalized shopping experiences. Analyzing how a customer come to make a purchase, or the path to purchase, is one way big data tech is making a mark in retail. 66% of retailers have made financial gains in customer relationship management through big data.

2. CONCLUSION

In the field of big data there is necessity of a very high level of multi-disciplinarily. Statistical scientists are well-trained in both planning of studies, and in inference under uncertainty. Computer scientists bring a sophisticated mix of computational strategies and data management expertise. Both these group of researchers need to work closely with scientists, social scientists, and humanists in the relevant application areas to ensure that the statistical methods and computational algorithms are effective for the scientific and the social problem of interest. This integration is not an invention of the world of big data by any means. Statistics is an inherently applied field and collaborations have been a major focus of the discipline from its earliest days. What has changed is the speed at which new technology provides new challenges to statistical analysis, and the magnitude of the computational challenges that go along with this.

The new generation must be ready to take on this challenge and to work effectively on an interdisciplinary team and understand the immense importance of objective benchmarks to evaluate statistical tools. We must all continue learning, questioning, and adapting as new challenges are presented. The science of learning from data is arguably the most beautiful and inspiring field.

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3. Internet of Robotic Things: Robots are machines that exhibit an intelligent behaviour as they sense and interact with their environment. Combining robotics with an Internet connection adds an enormous source of information for robots to decide and interact. The next logical step is for this ubiquitous connectivity to improve smart devices that not only get the job done, but also mesh to create a combined intelligence and determine a best course of action for the devices involved. ABI Research defines The Internet of Robotic Things or IoRT as “intelligent devices that can monitor events, fuse sensor data from a variety of sources, use local and distributed ‘intelligence’ to determine a best course of action”. In simple words, if IoT are our extended eyes, nose and ears then IoRT are our extended legs, arms and brain. Robotic principles of intelligence, manipulation mobility, autonomy and movement are enhanced by the Internet of Things. Robotics scientists no longer have to invest huge amounts of time, energy and money in recognition capabilities for robots as the Internet of Things provides reusable and open information that robots can access to carry out their tasks. These connected IoRT robots are just the logical evolution of Robotics. Transforming the machine to machine concept into robot to robot seems a natural evolution as robots are expected to perform jobs in a more effective, accurate and reliable way the same way we expect m2m technologies to provide these results over traditional industrial processes. Are there any existing successful IoRT examples? Of course there are. We have already heard of something we could very well dub the ‘IoRT vehicle’. Google and other companies (mainly car manufacturers) are pushing the concept of autonomous vehicles. These driverless cars would rely on two aspects, a slew of sensors and a central processing unit that decides what course of action the vehicle takes depending on the information provided by the environment. A group of Stanford scholars created an autonomous vehicle in 2005 that completed a 212 km off-road course in under 7 hours turning it into the first successful robotic vehicle marking the kick-off of self-driving vehicles. Part of this team went on to develop Google’s self-driving car. Google’s vehicle applies Robotics to a modified vehicle that has an array of additional sensors allowing the car to make its own decisions based on the information as it drives. Narrow streets, pedestrians, traffic lights, toll booths or any traffic situation are not obstacles for the learning vehicle to drive intelligently and safely. The overlapping of Robotics and the Internet of Things will deliver advanced and unprecedented functionality (driving for the blind, emergency assistance in extreme or unhealthy conditions for humans, repetitive manual labour under controlled conditions, etc.). Going back to the self-driving vehicles, Sebastian Thrun, a research professor at Stanford and the person who launched the Google Self-Driving program illustrates the impact bold IoRT projects can have in the world: “I can’t bring back to life a person that passes away in a traffic accident, but I can try to save a million lives every year”

4. Why Internet of Things Important for Industrial Robotics? IoT is easy to know in the environment of day-to-day life. But, how is it useful for industrial robotics? To respond on this query, let's look how IOT concepts have already included into their systems by two big robotics **i)ABB**In 2015, ABB placed at the heart of IoT technologies in industrial robotics have started becoming part of the Industrial Internet Consortium. They have been finding ways to integrate all of the sensors and devices on a manufacturing shop floor to improve all areas of their operations, including: improving the reliability of systems and optimizing processes, reducing the downtime of robots. **There are great benefits when every robot is able to store and analyze its own usage data, and then is able to communicate that data smartly to other connected devices.** For example, ABB doesn't have to schedule the robot maintenance. The robot itself can monitor its own actual usage and performance report. Then problems are identified before they have become problems. **ii)KUKA**In 2014, KUKA integrated with Microsoft's Azure IoT platform to create a "connected factory" of 60,000 devices and 259 robots. The factory which is automated 24 hours is able to manufacture automobiles very agreeably thanks to the IoT approach.

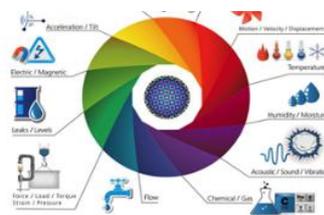


Image: Mit.edu

5. What is Common Protocol for the Internet of Things?

One of the big issues which we might imagine is how to decide on a common protocol. **In order for everything to be able to communicate, the devices must be "speaking the same language."**

In today’s consumer world, there are already four big competing protocols - Qualcomm's AllJoyn, Intel's IoTivity, Apple's HomeKit and Google's Brillo.

i)AllJoyn allows devices to communicate with other devices around them and it is a collaborative open source software framework. AllJoyn framework is flexible, promotes proximal network and cloud connection is optional. A simple example would be a motion sensor letting a light bulb knows no one is in the room it is lighting, so it can shut itself off.

In October 2016 they announced their merger into IoTivity. Also during the merging announcement time, it was stated that current devices running either IoTivity or AllJoyn will be backward compatible and interoperable.

ii) The IoTivity is an open source project. The Linux Foundation has hosted IoTivity project, and sponsored by the Open Connectivity Foundation (OCF) The IoTivity architectural goal is to create a new standard by which billions of wireless and wired devices will connect to each other and to the internet for communication

iii) Android Things (codenamed Brillo) is an Android-based embedded operating system platform by Google, announced at Google I/O 2015. It is designed to work with low power consumption and memory constrained Internet of Things (IoT) devices, which are probably built from different MCU platforms. It is proposed to work with an IOT OS as low as 32–64 MB of RAM. It will support Wi-Fi and Bluetooth Low Energy. Along with Brillo, Google also introduced the Weave protocol, which allows these devices to communicate with other devices and which it hopes will be adopted by other IoT operating systems. Every Android device recognize automatically any Brillo OS or Weave API based device. Users can choose a device, set it up and use it immediately

iv) HomeKit is a software framework by Apple that lets users set up their iPhone or other Apple device to configure, communicate with each other, and control smart-home appliances. Automatic actions in the house through a simple voice dictation to Siri or through apps by designing rooms, items and actions in the HomeKit service.

Although these consumer protocols might be used for home robots, industrial robotics is going to need a slightly different protocol. Security will be paramount. There are a few potential options for an **Industrial Internet of Things (IIoT)**, including the Predix from General Electric and Connex DDS protocol from RTI. **i) RTI Connex[®] DDS** Professional designed for the challenging needs of the Industrial Internet of Things (IIoT). It is the primary connectivity framework for new applications—such as analytics

ii) Predix is General Electric's software platform for the gathering of data and examination of data from industrial machines. GE is a member of the Industrial Internet Consortium which works to assist the progress and use of industrial internet technologies.

We might think that it's going to be difficult to decide on a standard protocol. However, **one of the proposed strengths of the IoT approach is that it does not depend on a standard protocol. Instead, the IoT is the communication paradigm between several devices despite of the specific protocols used.**

So, for example, all of the robots in my company might communicate using one platform, while all the robots in other com any might use a different platform. My robots couldn't communicate directly with other company robots even we would both use the IoT approach. Then, I can foresee some sort of connecting protocol will become necessary in the upcoming; however, we shall just have to stay and see.

IOT-AIDED ROBOTICS APPLICATIONS The synergy of IoT and robotics remains largely an untapped field of future technology that has the potential to bring about drastic changes to how we live today. IoT based solutions are changing the way we tackle problems. Smart homes, wearables, smart cities, smart grids, industrial internet, connected cars, connected health, smart retail, smart supply chains and smart farming are only a few of the IoT applications in today's times which have impacted how we live as a society. By providing real time, quantifiable and decisive data, IoT has reduced our response time to critical problems and in a few cases made removed the need for human supervision to solve problems. Robotics, on the other hand is a field of science that has been held back the technology of its time. To top it off, the investment required to deploy robotics based solutions is high. This is however changing Robotics based solutions to challenges are quickly emerging. Industrial robots, used in the manufacturing and automobile industry have reduced production time, reduced degree of error and improved quality produce. Robots are used for deep underwater explorations and unchartered space explorations. In this section, I'll be focussing on Internet of Robotic Things applications/solutions in healthcare, industry, military and search and rescue operations.

I) Robots in House Keeping Using IOT

This IOT based indoor mobile robot, which is used for the housekeeping service and called as "smart housekeeper". The robot is equipped with the crawler chassis structure and the head lifting machinery. It applies Cortex-M4 as the main controller, and communicates with the outer by WiFi. A smart mobile phone is used as its head. People can operate the robot remotely by another smart mobile phone at any time. It can realize remote video searching, home appliance control, and indoor security. The experiment shows that it works well with all the functions.

II) Educational Robots for Internet-of-Things

Supported Collaborative Learning

We present a vision of using educational robots as smart mobile components ("things") of Internet-of-Things. Such robots, beside their primary mission to facilitate learning, are able to communicate; have computing capabilities; as well as have sensors and actuators to sense and change their physical context. The robot serves both as the educational service that allows to visualize knowledge through explicit actions and behaviour as well as the enabler of learning and providing student engagement through immersion and instant feedback. The vision is based on the principles of contextualization, physicality and immersion. The pedagogical background is the proposed Internet-of-Things Supported Collaborative Learning (IoT-SCL) paradigm based on constructivism, which provides a highly motivating learning environment in university, promoting collaboration among students, and achieving the creation of new knowledge in a reflexive process

directed by the teacher. We demonstrate the implementation of the paradigm in the project-based setting at the university course and evaluate it using the Four-Phased Model of Interest Development.

III) Humanoid robots

Internet of things is becoming the most growing technology in recent days. Main idea behind the IoT is to extract the various values from various sensors which are attached to various objects by connecting them to the network and automating the actions performed by the object or a system. In this paper, a study is made to understand the importance of use of IoT in humanoid robots. In order to appreciate this growing technology, this technology should be implemented to as many objects as possible so that everything will get connected in future. Along with other hardware developments, 5G internet technology is also getting developed rapidly. Use of IoT in humanoid will make many things easier to monitor and control in many ways.

IV). Healthcare applications

IoT applications in the healthcare industry range from remote monitoring of patients. Wireless devices that monitor the patient's vitals are connected together in Wireless Body Area Network that delivers the collected data to a remote device for monitoring, tracking and analysis. Edge devices that gather timely data of the patient, allow healthcare providers to remotely monitor, assist and if possible provide medication to those patients for whom it may not be feasible to meet their healthcare provider. Robotics in healthcare is mostly seen in literature and there is little widely in practice today. IoT and robotics solutions can deploy to provide assistance to disabled, elderly patients and those with locomotory issues. Monitoring and tracking of medical equipment or lack of can greatly improve management of hospitals and medical equipment so that less amount of time goes into maintaining infrastructure. This can greatly improve the quality of medical service that is dispensed to patients.

V). Industrial Applications and Personal Applications IoT solutions

Solve a wide range of problems in industry from electrical grid system monitoring, temperature monitoring, power consumption, lubricant status, etc. IoT applications are also often used in perimeter intrusions detection systems at airports, railway stations and ship ports. Smart objects are used to manage parking places. Smart objects comprising the wireless sensor network (WSN) are used enable automation, energy monitoring and control and surveillance systems. Robots in industry are largely used in large assembly lines to speed up the production process. Robotic perception along with artificial intelligence is used for efficient human robot interaction. Moving toward the vision of a robot in the personal space, cleaning and servicing robots are increasingly becoming common trend. Efforts are being made to deploy robots in the public space for surveillance and monitoring activities. IoT aided robotics are most suitable for scenarios where real time data is required from inhospitable environments for long durations of time. IoT aided robots can be strategically deployed to get high quality real time data which would not have possible from disconnected robots.

VI). Military Applications

IoT in the military is used to detect presence and intrusion of unwanted chemical agents, signals, radiations etc though photoelectric, laser and acoustic sensors. They are used to uncover hidden areas of danger, track enemy movements, detect snipers and perform perimetric surveillance in sensitive areas. The most common type of robotic military application would be the unmanned aerial, ground, and underwater vehicle. These robots are use to cover areas which would normally put the life of many soldiers at risk. Using these, remote surveillance and attack can be carried out over crucial strategic zones. IoT aided robot applications can include the co-ordination of smart objects with UAVs, UGVs and UUVs. Smart objects can detect and uncover chemical agents, hazard zones and nuclear/biological weapons in the given environment, these can then be traversed by UGV/UAV/UUV to further evaluate and monitor the environment.

VII). Rescue Applications Smart objects in are used to collect emergency information and distribute the captured data to the required sources in the least amount of time as possible. IoT devices operating in a wireless sensor network are ideal in disaster scenarios to relay critical information as the default communication infrastructure may be damaged. They are used to monitor the relief and rescue operations of the affected site. This information can be used to organize and direct ground rescue forces to critical areas. Robot applications in rescue are used in search and rescue, where it is too dangerous or not physically possible for rescue and relief forces to save people. IoT aided robot applications can be used to coordinate with relief and rescue forces on the ground to prioritize operations according to risk and damage to the environment and then to deploy robot applications to perform search and rescue operations on high priority locations.

7. CONCLUSION

The Internet of Things, interconnected objects of world-wide network, can be considered an progressive process, rather than entirely one. "From anyplace, anytime connectivity for anyone, we can be achieve connectivity for anything" . Researcher's estimate that new innovative applications will emerge in the near future to exploit the connectivity and accessibility of everything connected to IoT. RFID technology is viewed as a key enabler for the development of IoT infrastructure. Thus, RFID provides anything connected to IoT with the capability of being uniquely identified. Robots can offer feasible solutions for anyplace, anytime connectivity for anything, enabling the development of IoT. Actually, connecting robots to IoT allows them to connect with other things in IoT, such as, external sensors (e.g., temperature sensor) and external processing units (e.g., clouds) to obtain valuable information for performing various tasks. Robots

through IOT can increase robots' capabilities, such as, sensing, processing, and acting. In this way, robots can be considered as belonging to the Internet of Things.

8. Future Scope

A report released at end 2016, by Markets and Markets predicts that the Internet of Robotic Things market will be worth approximately \$21.44 billion by 2022. This would mean a Compound Annual Growth Rate (CAGR) for the IoRT market of 29.7 percent until 2022. To put this into perspective: IoT spending in the utilities market (mainly smart grid) in 2016 totaled \$69 billion. Although 2022 is still far away it gives you an idea of the IoRT market's importance if the forecasts are more or less correct. However, there are still some challenges for worldwide IoT adoption, from infrastructures improvement to standardisation.

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AGRITECH

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ABSTRACT

The present study was undertaken with a view to identify and analyze the magnitude of crop production and its sources with special emphasis on the role of modern technology. Farmers make decisions based on the information they have on hand, which is why data has helped them harness the power of information to make better informed decisions that allow them to use resources more sustainably. This serves as a digital platform that brings together data collection, production analysis, agronomic modelling, field monitoring etc., which gives farmers a better understanding of their fields. These tools allow the farmers to plan for better harvest and make decisions that are better for planet. Farmers require ongoing education to stay aware of fast moving developments in science, business management and technologies in agriculture including the access of internet at their homes so that when the produce is at a pre-harvesting stage farmers can notify the consumers so, immediately after the harvest the order can be transported with cryopreservants to the consumer directly. This is a win-win situation for both the consumers and the farmers of these agricultural products. Consumers gets these products while still fresh and the farmers will sell all the products as the demand is high to increase on their RIO>Returns On Investments. This helps in preventing the interference of third party between farmer and the consumer who generally loots the farmer's income. Adopting various technologies like GM plant material, organic farming, fustigation, sophisticated machinery,AI,GPS Technology etc helps in facilitating the transition from conventional farming to modern farming. It aids in making sound financial management decisions and discover new economic opportunities.

Key words-modern technology, digital platform, cryopreservants, modern farming.

INTRODUCTION

Agriculture occupies a very important role if the growth of economy of our country, which is also the backbone of economic system. India is primarily an agricultural country. The prosperity of the Indian economy is dependent on the course of Agricultural production. Of course, agriculture contributes the major share of the national income of India. In India, agriculture meets almost the entire food requirements of the people. Agriculture also provides fodder sustain in livestock who's number runs to several crores.Indian agriculture is going to visualize technology-led agriculture with nanotechnology, genetic engineering, geographical information system(GIS), information and Communication Technologies(ICT), weather based forecasting and also, the human resource management to garner benefits from these technologies.

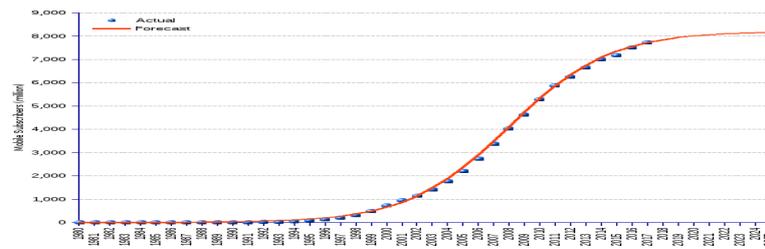
A VIRTUAL MARKET PLATFORM FOR FARMERS-ICT

Indian agriculture is a complex enterprise involving millions of small and marginal farmers. Many of them are illiterate, resource-poor and have little or no access to modern technologies. Knowledge management (KM) is therefore a very challenging task in Indian agriculture. Unless everyone connected with agriculture is brought to a common platform for sharing and refining information, finding solutions to local problems through crowd sourcing information is not easy. With the recent advances in information and communication technologies (ICTs), connecting people on a common knowledge platform is not that difficult in technical terms.

It also empowers poor farmers with information and communication assets and services that will increase their productivity and incomes as well as to protect their food security and livelihoods, and to harness ICTs effectively to compete in complex, rapidly changing global markets.

As agriculture has become more complex, farmers' access to reliable, timely, and relevant information has become increasingly important. Farmers require access to more varied, multisource and context-specific information, related not only to best practices and technologies for crop production and weather, but also to information about post-harvest aspects, including processing, marketing, storage, and handling. Generalized content often made available through web-portals and other ICTs often has very little value to farmers who cultivate crops in varied agro-ecological settings. Information that is context specific rather than generic could have important impacts on the adoption of technologies and could increase farm productivity for marginal and small agricultural landholders.

Despite the potential cost and time associated with generating localized content, access to locally contextualized quality content is more relevant for the poor and more useful to their information needs reliable, easily available, quality content that is relevant for farmer decision-making could also reduce information-seeking and learning costs more-specialized applications, such as software used for supply chain or financial management are also becoming more relevant in smallholder farming. Simple accounting software has allowed cooperatives to manage production, aggregation, and sales with increased accuracy. Along with electronic administration, the coop plans to invest in Global Positioning System (GPS) technology to obtain certifications and use cameras and video as training materials to raise the quality of production.



Source: International Telecommunications Union

FARMER IN COMMODITY MARKET

Generally, the middlemen and wholesale businessmen purchase the Agricultural products from the farmers at a lower price. They also get the commission from the farmers for the transactions made. In turn, fresh vegetables and fruits purchased at the lower price from the farmers are sold out to retail businessmen at higher price and the retail businessmen sell those Agricultural Products further at higher price to the consumers. As a result, the farmers get only the lower price for their produce whereas the consumers have to pay higher price for the same products.

Government tries to protect the interests of the poor Indian farmers by procuring crops at remunerative prices directly from the farmers without involving middlemen in between. This way Government maintains sufficient buffer stocks and at the same time provides the farmers safeguard against the fluctuating food crop prices. But government at the same time has restricted this traditional sector by fixing prices of crops at a particular level and also by imposing several other restrictions on export and import of agricultural commodities. All these restrictions prevented this sector to move out its traditional features. So according to many economists liberalization of this traditional agricultural sector could have been of great benefit to our economy. But questions will naturally come up about the maintenance of buffer stocks and provisions of remunerative prices to the farmers. In absence of government's intervention farmers will not be getting any prior information about the future markets of their products. Naturally a sudden price crash of food crops will have devastating effects on farmers. Here comes the significant role of futures market. If the buyers in the commodity market anticipate shortage of a particular crop in the coming season, future price of that crop will increase now and this will act as a signal to the farmers who will accordingly plan their seeding decisions for the next season. In the same way, an increase in future demand of food crops will be reflected in the today's price in futures market. In this way the system of futures market can be of great help to the Indian farmers preventing them from being directly exposed to the unexpected price changes all of a sudden. It also helps towards evolving a better cropping pattern in our country.

If the peasants are farming some crop now and are very much concerned that price will crash by the time the crop comes in, then if there is futures market, they will have the option to sell their products in it. Price in the future markets being fixed; by selling products in future markets they get rid of their worries about the about the unexpected price fall. This helps them to take the risk of innovations, by using new high yielding varieties of seeds, fertilizers and new techniques of cultivation. Futures Market will act as a smoothing agent between the present and future commodity market. If the price, which is going to prevail in future, is high compared to what is it now, then the arbitragers would like to buy the commodities now to sell those in future. The reverse process is also true. So the existence of a futures market is always good for any economy. It opens up a new opportunity to people to protect themselves from unexpected risks.

GM TECHNOLOGY

GM crops currently on the market are mainly aimed at an increased level of crop protection and production .The development of GM technology that delays ripening of fruit and vegetables, thus allowing an increased length of storage. Farmers would benefit from this development by increased flexibility in production and harvest. Consumers would benefit by the availability of fruits and vegetables in fresh form. In many cases small-scale farmers suffer heavy losses due to excessive or uncontrolled ripening or softening of fruit or vegetables.

GPS TECHNOLOGY

The GPS (Global Positioning System) and GIS (Global Information System) have advanced quite well in last few years. Farm equipment manufacturers have developed several GPS tools to help farmers and agribusinesses become more productive and efficient in their precision farming activities.Pest problem areas in crops can be pinpointed and mapped for future management decisions and input recommendations.

SOPHISTICATED MACHINERY

The most advanced agricultural technologies employed today are: Tractors on autopilot, Swath control and variable rate technology, Your tractor is calling, Your cow is calling tool, Irrigate via Smartphone, Sensing how your crop is feeling

Future of agriculture is expected to be highly promising due to significant use of technology in farming. But however, developing and poor nations still lag behind in using such robots and are rather highly dependent on manual methods of farming. But use of such equipment and robots is definitely increasing in such countries due to rising trend of mechanization and modernization in developing nations.

CONCLUSION

India needs to raise the level of productivity and quality standards to international levels, which is one of the major challenges. However, recent reports state that agriculture plays an important, though declining role in Indian economy. Its contribution in overall GDP fell from 30 % in the early nineties, to below 17.5 % in 2006 and even more less in the recent years. As mentioned earlier, for a large majority of farmers in different parts of the country, the gains from the application of science and technology in agriculture are yet to be realized which would require infrastructural support, improved technologies and provision of inputs at reasonable cost. In contrast, where costs are reduced by research and improved infrastructure, agriculture can attain growth rates of at least 50 percent higher than in the past. That would have powerful multipliers to the rural non-farm sector, thereby reducing poverty, increasing employment, and increasing food security.

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EFFECT OF PRE AND POST EMERGENCE HERBICIDES ON GROWTH AND YIELD OF IRRIGATED MAIZE (*ZEA MAYS L.*)

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ABSTRACT

A field experiment was conducted at the experimental farm, department of Agronomy, Faculty of Agriculture, Annamalai University during summer (Feb-May 2016) to know the effect of pre and post emergence herbicides on growth and yield of irrigated maize. The experiment was taken up in randomized block design (RBD) with 9 treatments replicated thrice viz., Unweeded control (T₁), Twice hand weeding @ 20 and 40 DAS (T₂), Alachlor @ 1.5 kg a.i ha⁻¹ (T₃), Atrazine @ 1.0 kg a.i ha⁻¹ (T₄), Tembotrione @ 100 g a.i. ha⁻¹ (T₅), Alachlor @ 1.5 kg a.i ha⁻¹ + Hand weeding (30 DAS) (T₆), Atrazine @ 1.0 kg a.i ha⁻¹ + Hand weeding (30 DAS) (T₇), Alachlor @ 1.5 kg a.i ha⁻¹ + Tembotrione @ 100 g a.i. ha⁻¹ (T₈), Atrazine @ 1.0 kg a.i ha⁻¹ + Tembotrione @ 100 g a.i. ha⁻¹ (T₉). The experimental soil was clay loam. The results of the experiment revealed that the growth parameters viz., plant height (216.57 cm), Leaf area index (7.94) and crop dry matter production (13514 kg ha⁻¹) were significantly higher in the plots applied with Atrazine @ 1.0 kg a.i ha⁻¹ + Tembotrione @ 100 g a.i. ha⁻¹ (T₉) which was on par with twice hand weeding (T₂). All the growth parameters were decreased significantly in Unweeded control. Among the weed control measures, Atrazine @ 1.0 kg a.i ha⁻¹ + Tembotrione @ 100 g a.i. ha⁻¹ (T₉) significantly increased the yield components viz., cob length (21.33 cm), cob diameter (9.18 cm) and grains cob⁻¹ (384) which was at par with twice hand weeding (21.28 cm, 9.06 cm, 380.75 respectively) followed by Atrazine + hand weeding treatment. Grain yield was significantly increased with the application of Atrazine @ 1.0 kg a.i ha⁻¹ + Tembotrione @ 100 g a.i. ha⁻¹ (T₉) compared to other treatments. The lower grain yield (2452 kg ha⁻¹) was recorded in unweeded control.

Key words; Maize, weed control, Atrazine, Alachlor, Tembotrione, growth, yield.

INTRODUCTION

Maize is the most important food crop in the world and it occupies a prominent position in global agriculture after wheat and rice. Maize is gaining popularity at a faster rate due to its increasing demand particularly as livestock feed besides being used as food for human and also as an industrial raw material. The productivity of maize in India is declining due to an array of biotic and abiotic factors. The low yield of maize under Indian conditions may be attributed by number of factors, among them weeds rank as prime enemy. Besides quantitative effect on yield, weeds deteriorate the quality of produce through physical presence of the weed seeds and debris. Timely and effective weed control will go a long way in gaining crop yields. Weeds emerge fast, grow rapidly and competing with the crop for growth resources viz., nutrients, moisture, sunlight and space during entire vegetative growth and early reproductive stages of maize (Oerke, Dehne, 2004). The yield loss in maize ranges from 28-93 % due to severe weed infestation (Karki *et al.*, 2014). To minimize the weed losses, several weed control methods are available such as mechanical, cultural, chemical and biological methods. With the gradual increase in industrialization of our country, coupled with the raising standard of living and literacy, manual labour is becoming scarce. Traditional hand weeding is the most efficient and widely adopted practice of weed control, but it is labour intensive, time consuming and costly due to high wage rates which narrowed down the profits of the cultivation. Keeping in view of these limitations, the use of herbicides is the best way which gives a quick and cost-effective solution of the numerous weed problems in maize field and hence has gained an important position over conventional methods (Chikoye *et al.*, 2003). However, the continuous use of single herbicide or herbicides having the same mode of action may lead to resistance problem in weeds. Hence it is necessary to test combination of the existing and new herbicides to control mixed weed flora in maize.

MATERIALS AND METHODS

A field experiment was conducted at the experimental farm, department of Agronomy, Faculty of Agriculture, Annamalai University during summer (Feb-May 2016) to know the effect of pre and post emergence herbicides on growth and yield of irrigated maize. The experiment was laid out adopting randomized block design (RBD) with 9 treatments replicated thrice. The treatments include : T₁.Unweeded control, T₂.Twice hand weeding (20 and 40 DAS), T₃. Alachlor @ 1.5 kg a.i ha⁻¹ (pre), T₄. Atrazine @ 1.0 kg a.i ha⁻¹ (pre), T₅.Tembotrione @ 100 g a.i. ha⁻¹(post), T₆. Alachlor @ 1.5 kg a.i ha⁻¹ + Hand weeding (30 DAS), T₇. Atrazine @ 1.0 kg a.i ha⁻¹ + Hand weeding (30 DAS), T₈. Alachlor @ 1.5 kg a.i ha⁻¹ + Tembotrione @ 100 g a.i. ha⁻¹ and T₉. Atrazine @ 1.0 kg a.i ha⁻¹ + Tembotrione @ 100 g a.i. ha⁻¹. The experimental soil was clay loam. The maize hybrid NK6240 was sown with the spacing of 60x20 cm and all the agronomic practices followed as per the recommendations. In the unweeded control treatment, the weed flora was allowed to grow without any control measures. In twice hand weeding, two hand weedings were taken up, one at 20 DAS and again at 40 DAS by hand hoeing. In herbicide treatments, required quantities of atrazine and alachlor were sprayed as pre-emergence at 3 DAS on soil at optimum moisture content and required quantity of Tembotrione was sprayed as post-emergence at 21 DAS. Hand

weeding to supplement herbicides in treatments concerned was done on 30 DAS. The herbicides were applied through knapsack sprayer fitted with a flood jet nozzle using 500 liters of water per hectare. Observations were recorded on growth parameters, yield and yield components. The experimental data were statistically analysed with the methods described by Panse and Sukhatme, 1978.

RESULTS AND DISCUSSION

The observations on growth components i.e. plant height, leaf area index and crop dry matter production are presented in the table 1.

Plant height (cm)

Among the weed control measures in maize, atrazine @ 1 kg ha⁻¹ (pre) + tembotrione @ 100 g ha⁻¹ (post) resulted in increase in plant height of 216.57 cm at harvest stage which was on par with twice hand weeding (209.32 cm) followed by Atrazine + hand weeding (191.78 cm). Unweeded control registered the least plant height of 98.13 cm. The increase in plant height might be due to better weed control throughout the growth stages of maize and better availability of all resources viz., light, moisture, space and nutrient to maize (Bibi *et al.*, 2010).

Leaf area index (LAI)

All the treatments significantly influenced the LAI of the crop. Among the weed control measures compared, the highest leaf area index of 7.94 was recorded with atrazine @ 1 kg ha⁻¹ (pre) + tembotrione @ 100 g ha⁻¹ (post), which was on par with the integrated weed control measures involving twice hand weeding (7.84) followed by Atrazine + hand weeding (6.92) and the lowest was observed in control (3.08). This increase in LAI might be due to more uptake of nutrients by crop, which reflected maximum growth characters which were responsible for higher LAI as reported by Gul and Khanday (2015).

Crop dry matter production (kg ha⁻¹)

All the treatments attained significance in influencing the crop dry matter production. Among the weed control measures compared, atrazine @ 1 kg ha⁻¹ (pre) + tembotrione @ 100 g ha⁻¹ (post) performed better by virtue of recording higher dry matter production of 13514.46 kg ha⁻¹ at harvest stage, which was on par with twice hand weeding (13062.25 kg ha⁻¹) followed by Atrazine + hand weeding (11946.92 kg ha⁻¹). The higher dry matter with post-emergence herbicides applications might be due to increased availability of nutrients to crop by reducing weed growth efficiently. Similar result was reported by Malviya and Singh (2007). The lowest dry matter production (4198.29 kg ha⁻¹) was recorded in unweeded control, which was due to higher nutrient removal by weeds and resulted in poor growth characters and dry matter production.

Table-1. Effect of weed control treatments on plant height (cm), LAI and Dry matter production (kg ha⁻¹) in maize

TREATMENTS	Plant height (cm) At harvest	LAI at 60 DAS	DMP At harvest
T ₁ - Unweeded control	98.13	3.08	4198.29
T ₂ - Hand weeding twice on 20 and 40 DAS	209.32	7.84	13062.25
T ₃ - Alachlor @ 1.5 kg ha ⁻¹ on 3 DAS	114.55	3.67	5122.52
T ₄ - Atrazine @ 1.0 kg ha ⁻¹ (pre)	129.58	4.34	6376.75
T ₅ - Tembotrione 100 g ha ⁻¹ (post)	144.56	4.95	7742.07
T ₆ - Alachlor @ 1.5 kg ha ⁻¹ (pre)+ Hand weeding on 30 DAS	160.48	5.66	9266.32
T ₇ - Atrazine @ 1.0 kg ha ⁻¹ (pre)+ Hand weeding on 30 DAS	191.78	6.92	11946.92
T ₈ - Alachlor @ 1.5 kg ha ⁻¹ (pre)+ Tembotrione 100 g ha ⁻¹ (post)	176.10	6.17	10691.64
T ₉ - Atrazine @ 1.0 kg ha ⁻¹ (pre)+ Tembotrione 100 g ha ⁻¹ (post)	216.57	7.94	13514.46
S.E _D	6.86	0.22	260.37
CD(p=0.05)	14.56	0.48	552

Yield components and yield

The data recorded on yield components *viz.* cob length (cm), cob diameter (cm), number of grains per cob and grain yield (kg ha^{-1}) are presented in the table 2.

Cob length (cm)

All the treatments attained significance in influencing the cob length of maize. Among weed control measures, atrazine @ 1 kg ha^{-1} (pre) + tembotrione @ 100 g ha^{-1} (post) recorded the highest cob length of 21.33 cm, which was on par with twice hand weeding (21.28 cm) followed by Atrazine + hand weeding (19.22 cm). The lowest cob length of 11.38 cm was recorded under unweeded control.

Cob diameter (cm)

All the treatments significantly influenced the cob diameter. The highest cob diameter of 9.18 cm was recorded with atrazine @ 1.0 kg ha^{-1} @ 3 DAS + tembotrione @ 100 g ha^{-1} on 21 DAS (post). However, it was on par with twice hand weeding (9.06 cm) followed by Atrazine + hand weeding (8.47 cm). The least cob diameter of 5.38 cm was recorded in unweeded control.

Number of grains per cob

All the treatments significantly influenced the number of grains cob^{-1} . The highest number of grains cob^{-1} (383.93) was recorded with atrazine @ 1 kg ha^{-1} (pre) + tembotrione @ 100 g ha^{-1} (post) which was on par with the treatment twice hand weeding (380.75). The least number of grains cob^{-1} (186.64) was recorded in unweeded control.

The better suppressing of weeds at early stage favored the vigorous growth and establishment of crop, without any crop weed competition and with sustained nutrient availability leads to better uptake of N, P_2O_5 and K_2O by the crop might have contributed to the increased yield components. These results were in agreement with the findings of Hawaldar and Agasimani (2012).

Grain yield (kg ha^{-1})

Grain yield is the final outcome of the crop growth and cumulative effect of growth and yield attributing characters. Among the weed control measures compared in maize, atrazine @ 1 kg ha^{-1} (pre) + tembotrione @ 100 g ha^{-1} (post) recorded the highest grain yield of 6518 kg ha^{-1} and it was on par with the twice hand weeding (6420 kg ha^{-1}) followed by atrazine + hand weeding (6095 kg ha^{-1}). Unweeded control registered the lowest grain yield of 2452 kg ha^{-1} . Efficient weed control during the critical period of crop weed competition, higher LAI and sustained availability of nutrients for uptake of the crop contributed to higher post flowering photosynthesis and assimilate partitioning to sink, might be the reason for higher grain and stover yield. However, it was on par with twice hand weeding at 20 and 40 DAS, which ranked next in grain and stover yield. This might be due to better removal of weeds at early stage which favoured the growth and yield components. This reflected by registering higher grain and stover yield of maize with this treatment (Kamble *et al.*, 2005).

Table-2. Effect of weed control treatments on yield components and yield in maize

TREATMENTS	Cob length (cm)	Cob dia. (cm)	No. of grains cob^{-1}	Grain yield (kg/ha)
T ₁ - Unweeded control	11.38	5.38	186.64	2452
T ₂ - Hand weeding twice on 20 and 40 DAS	21.28	9.06	380.75	6420
T ₃ - Alachlor @ 1.5 kg ha^{-1} on 3 DAS	19.72	5.96	237.84	3508
T ₄ - Atrazine @ 1.0 kg ha^{-1} on 3 DAS	15.11	6.41	263.48	4020
T ₅ - Tembotrione @ 100 g ha^{-1}	16.13	7.02	284.93	4505
T ₆ - Alachlor @ 1.5 kg ha^{-1} on 3 DAS + Hand weeding on 30 DAS	17.38	7.43	304.45	5157
T ₇ - Atrazine @ 1.0 kg ha^{-1} on 3 DAS + Hand weeding on 30 DAS	19.22	8.47	359.63	6095
T ₈ - Alachlor @ 1.5 kg ha^{-1} on 3 DAS + Tembotrione @ 100 g ha^{-1}	18.63	7.94	326.41	5625
T ₉ - Atrazine @ 1.0 kg ha^{-1} on 3 DAS + Tembotrione @ 100 g ha^{-1}	21.33	9.18	383.93	6518
S.E _D	0.36	0.14	8.89	147.16
CD(p=0.05)	0.78	0.30	18.85	312

Conclusion

From the present study, it could be concluded that weed control by pre-emergence application of atrazine @ 1 kg ha⁻¹ followed by post-emergence application of tembotrione @ 100 g ha⁻¹ could be suggested as an effective and economic weed control measure in increasing the growth, yield components and yield in maize.

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E-SAGU : AN IT BASED AGRO ADVISORY SYSTEM TO IMPROOVE FARM PRODUCTIVITY

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Abstract : The e-Sagu (The word 'Sagu' means 'cultivation' in Telugu language) is an IT-based personalized agro-advisory system. It aims to improve farm productivity by delivering high quality personalized (farm-specific) agro-expert advice in a timely manner to each farm at the farmer's door-steps without farmer asking a question. The advice is provided on a regular basis (typically once a week) from sowing to harvesting which reduces the cost of cultivation and increases the farm productivity as well as quality of agri-commodities. In e-Sagu, the developments in IT such as (database, Internet, and digital photography) are extended to improve the performance of agricultural extension services. The e-Sagu system offers next generation agro-advisory tool, and supplements and integrates into the existing agricultural extension system. In e-Sagu, rather than visiting the crop in person, the agricultural scientist delivers the expert advice by getting the crop status in the form of digital photographs and other information. The e-Sagu system contains the following parts: (i) Farmers (ii) Coordinators (iii) e-Sagu local center (iv) Agricultural information system and (v) Communication system. The e-sagu system shows a great promise in the era of globalization, as it can provide the expert advice that is crucial to harvest different kinds of crops based on demand in the world market with quality and assurance.

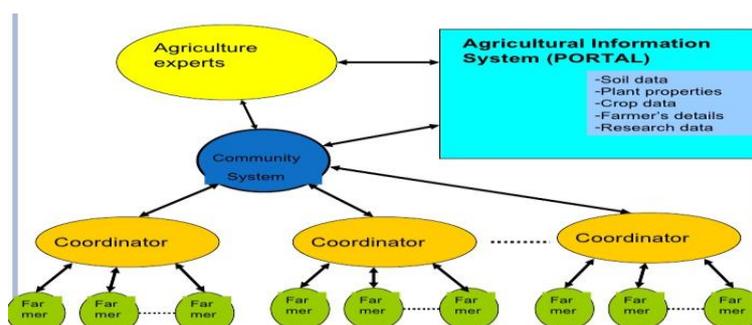
Keywords : e-Sagu , IT Based , Farm Productivity

Introduction

The farmers are the end users of the system and can be illiterate. A coordinator is an educated and experienced farmer who is stationed in the village. Each coordinator is attached to e-Sagu local center which contains few computers and a computer operator. Agricultural Experts possess a university degree in agriculture and are qualified to provide expert advice. Agricultural Information System is a computer based information system that contains all the related data. Communication system is a mechanism to transmit information from farms to agricultural experts and vice versa. If enough bandwidth is not available, photographs from the village to the main system can be transmitted through courier service. However, the advices (text) can be transmitted from the main system to the local center through dial-up Internet connection.

Procedure

The operation of e-Sagu is as follows. A team of agriculture experts work at the e-Sagu (main) lab (normally in a city) supported by agricultural information system. One e-Sagu local center (few computers and one computer operator) is established for a group of about ten to twenty villages. Educated and experienced farmers (who are from the villages) work as coordinators. Depending on the crop, each coordinator is assigned with a fixed number of farms. The coordinator collects the registration details of the farms under him including soil data, water resources, and capital availability and sends the information to the main e-Sagu system. Every day, the coordinator visits a fixed number of farms and takes four to five photographs for each farm. The coordinator also collects other information like weather and farmer feedback regarding crop situation. If the bandwidth is available the data is uploaded to the agricultural information system. Otherwise, a CD is prepared with the photographs and other information and transported to the main system by a regular courier service. The Agricultural experts, with diverse background (Entomology, Pathology, Agronomy) at the e-Sagu (main) lab analyze the crop situation with respect to soil, weather and other agronomic practices and prepare a farm specific advice. At the local e-Sagu center, the advice is downloaded electronically through a dial-up Internet connection. The coordinator collects the advice print out and delivers it to the concerned farmer. In this way each farm gets the proactive advice at regular intervals starting from pre-sowing operations to post-harvest precautions.



Advantages

- (a) Since 2004, the e-Sagu system has been implemented in about 10,000 farms in hundreds of villages for about 30 field and horticulture crops. The farmers are happy with the expert advice as it is helping the farmers to improve input efficiency by encouraging integrated pest management (IPM) methods, judicious use of pesticides and fertilizers by avoiding their indiscriminate usage.
- (b) Through e-Sagu, it is possible for the agricultural expert to provide the expert advice by observing the crop status through photographs for most of the crop problems and issues.
- (c) The impact analysis shows that the additional benefit accrued to farmers comes to Rs 3,874/- per acre with cost-benefit ratio = 1:4. The turnaround time for advice delivery is 24-36 hours. The farmers have paid the nominal subscription fee for the services and they are satisfied with the service.
- (d) The e-Sagu system provides a quality personalized agro-advice to the farmers. It is a query-less system and provides agro-advice even without the farmer asking a question by following a proactive approach and averts problematic situations.
- (e) Through e-Sagu accountable advice can be provided with two-way communication. The advice is comprehensive, complete and regular in terms of diagnosis, analysis, advice delivery, follow-up and feedback.
- (f) The e-Sagu is a scalable system. The system can be developed on the available infrastructure.
- (g) It is a cost-effective system and can be made self-sustainable with a nominal service charge.
- (h) The e-Sagu system enables farmers (marginal and poor) to cultivate with the same efficiency as agricultural experts.
- (i) Most important, the system provides strong database to support decision making and documents success stories and new problems.
- (j) The e-Sagu aids in successful implementation of crop insurance scheme by making farm as a unit of insurance. It also enables quick deployment of services during the times of crisis.
- (k) The banking industry can pick-up by improving the loan recovery, coverage, and financial inclusion problems.
- (l) The e-Sagu system capacitates rural livelihoods and generates rural employment.
- (m) The system can be used to validate agriculture technology.
- (n) It significantly reduces the lag period between research efforts and field application.
- (o) Similar type of Agro advisory system developed by Nagarjuna pvt.ltd as “I-kisan Agri-Informatics and Services” (www.ikisan.com)

Conclusion :

The e-Sagu system shows a great promise in the era of globalization, as it can provide the expert advice that is crucial to the Indian farmer to harvest different kinds of crops based on the demand in the world market with quality and assurance.

Future prospects

- Investigating the development of agri-business model by providing multiple services under one roof. The services include input supply , banking , ware housing , marketing and insurance
- Expanding e-sagu to Horticulture , aquaculture and animal husbandary

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 - Investigating the development of agri-business model by providing multiple services under one
 - Expanding eSagu to Horticulture, Aquaculture and Animal husbandry.
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GENETIC VARIABILITY, HERITABILITY, GENETIC ADVANCE AND CORRELATION STUDIES AMONG QUANTITATIVE TRAITS IN OKRA

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ABSTRACT

Analysis of the genetic variability, heritability, genetic advance and correlation among 15 quantitative traits in 12 okra genotypes sown in randomized block design (RBD) including novel genic male sterility lines was done at agriculture field experimentation centre, Loyola academy degree and P.G. College, Hyderabad. The ANOVA showed highly significant differences among the genotypes for all the traits except for number of branches per plant and number of ridges per fruit indicating the presence of sufficient variability in the experimental materials. Lowest difference between PCV and GCV were recorded for PH followed by NF/P, DFH, FSG, FG and NR/F is the indication of prevalence of genotypic effect rather than environmental effect on their expression. Hence, such traits respond well to selection. High heritability coupled with high genetic advance as per cent mean for NF/P, TY/P, PH, INL, NFF and AFW indicating the prevalence of additive gene action in their inheritance denoting the selection based on these traits to be quite effective. In association study, the traits, PH, INL, NB/P, AFW, NF/P and MY/P being positively correlated with TY/P could be used as traits of interest for indirect selection to improve TY/P in further breeding programme.

key words - genetic variability, heritability, gene action.

INTRODUCTION

Okra [*Abelmoschus esculentus* (L.) Moench] is one of the delicious tender fruit vegetable. It is grown extensively in tropics, sub-tropics and warmer seasons of the temperature as in the world. Okra immature fruits can be used in salads, soups and stews, fresh or dried, fried or boiled (Ndunguru & Rajabu, 2004). High level of dietary fiber, low caloric value and rich source of minerals, like Ca, P, K and Mg has made okra an important component of diet. Fruit is a rich source of iodine which is helpful in curing goitre and leaves are used as remedy for dysentery. Okra mucilage has medicinal applications when used as a plasma replacement or blood volume expander. The mucilage of okra binds cholesterol and bile acid carrying toxins dumped into it by the liver (Maramba et al., 2013). Therefore, okra is a capsule with potential health benefits. Although India is the largest producer of okra with 6.35 million tonnes production (72.9% of total world production) from 0.53 million hectare area (Anon, 2015), its productivity potential is low. To improve productivity, high yielding varieties need to be developed. Yield is a quantitative trait and is the result of actions and integrated function of a number of component traits. Its genetic improvement depends on the degree of variability for the desired traits in parental material and association between yield and its contributing traits. Therefore, knowledge of genetic parameters like genotypic coefficient of variation (GCV) and phenotypic coefficient of variation (PCV) are useful biometrical tools for understanding the extent of genetic variability in base population which is prerequisite. Conversely, heritable variation cannot be estimated with the help of GCV alone because yield and its attributes are highly environmentally influenced. According to Burton (1952) GCV along with estimates of broad sense heritability (h^2), genetic advance (GA) and genetic advance as per cent of mean (GAM) would give an idea about the nature of gene action governing a particular character which in turn helps in effective genotype based selection making. These studies will be still more constructive along with the correlation analysis which helps in estimation of inter-relationship among the yield contributing components and choosing component characters that are positively correlated with yield (Bhatt, 1973; Diz et al., 1994; Mihretu et al., 2014). With special reference to novel genic male sterility lines of okra developed at Indian Institute of Horticultural Research (IIHR), Bangalore, have made okra hybrid seed production still more easy, economical and commercially feasible (Pitchaimuthu et al., 2012). However, in these lines information pertaining to genetic variability and correlations is very limited. Therefore, the present study was undertaken to analyze the genetic variability, heritability, genetic advance and correlation among quantitative traits in okra genotypes including novel genic male sterility lines.

MATERIALS & METHODS

Experimental material consisted of seven elite okra genotypes (IIHR IIHR-285, IIHR-291, IIHR-294, IIHR-296, IIHR-299, GMS-1 and GMS-4) developed at IIHR and five popular varieties (VRO-6, Parbhani Kranti, Arka Anamika, JNDO-5 and Varsha Uphar). GMS-1 and GMS-4 were genic male sterility lines. Total twelve genotypes were raised in randomized block design (RBD) with three replications at spacing of 20 x 30 cm in paired row at Loyola academy degree and P.G. College at agriculture department field experimentation centre. Recommended agronomic practices and need based plant protection measures were taken. Data were recorded on five random plant basis for the fifteen characters namely days to first flowering (DFF), days to first harvest (DFH), node at first flower appeared (NFF), plant height (PH) (cm), internodal length (INL) (cm), number of branches per plant (NB/P), final stem girth (FSG) (cm), average fruit weight (AFW) (g),

number of fruits per plant (NF/P), total yield per plant (TY/P) (g), marketable yield per plant (MY/P) (g), marketable yield/ha (MY/ha) (t), fruit length (FL) (cm), fruit girth (FG) (cm) and number of ridges per fruit (NR/F). The data recorded were used to analyze genetic parameters like genetic variability, heritability, genetic advance and correlation using Indostat software package.

RESULTS & DISCUSSION

Analysis of variance and genetic variability The ANOVA showed highly significant differences among the genotypes for all the traits except for number of branches per plant and number of ridges per fruit indicating the presence of sufficient variability in the experimental materials (Table 1). The estimates of mean, genotypic variance (GV), phenotypic variance (PV), genotypic coefficient of variation (GCV) and phenotypic coefficient of variation (PCV) for 15 quantitative traits in okra genotypes are presented in table 2. Phenotypic variance (PV) agreed closely with genotypic variance (GV) for all the characters but significant magnitude of PV for days to first flowering (DFF), total yield per plant (TY/P) and marketable yield per plant (MY/P) is the indication of prevalence influence of environment on earliness and yield. The values of PCV were higher than GCV for all the characters which was well supported by findings of Sharma and Prasad (2015) and Senapati et al. (2011). High difference between PCV and GCV along with PV estimates were obtained for MY/P followed by MY/ha, TY/P, DFF, NFF, NB/P, INL, FL, NFF and AFW is the sign of occurrence considerable environmental influence on their expression. These findings corroborated with studies of Naidu (2007) for TY/P and AFW; Nwangburuka et al. (2012) for FL and NB/P; Nagre et al. (2011) for INL; Das et al. (2012) for NFF, DFF. Lowest difference between PCV and GCV were recorded for PH followed by NF/P, DFH, FSG, FG and NR/F is the indication of prevalence of genotypic effect rather than environmental effect on their expression. Such traits respond well to selection. Hence, it is suggestible that above traits can be improved through simple selection. Similar results were obtained by Kumar et al. (2011) for PH and NF/P; Santhakumar and Salimath (2010) for FSG; Sharma and Prasad (2015) for FG and DFH; Das et al. (2012) for NR/F. While in contrary Hazra and Basu (2000) reported moderate GCV for PH and NF/P. Heritability and genetic advance The heritability provides information on the magnitude of the inheritance of characters from parent to off spring, while genetic advance (also denoted by response to selection) is helpful in finding the actual gain expected under selection (Larik et al., 2000; Nwangburuka and Denton, 2012; Ogunniyan and Olakojo, 2014). Estimates of heritability in broad sense (h^2), genetic advance (GA) and genetic advance as percentage of mean (GAM) are presented in table 2. In present investigation high heritability coupled with high GAM was observed for NF/P, TY/P, PH, INL, NFF and AFW. These results corroborated with the observations of Das et al. (2012), Yadav et al. (2016), Ahamed et al. (2015), Singh et al. (2006) for above mentioned traits. High heritability coupled with low GAM was observed for DFH, FSG, FL and FG. High heritability and low GAM for these were also found from studies of Dhankar and Dhankar (2002) and Reddy and Sridevi (2014). According to Percy and Turcotte (1991), when heritability is mainly due to non-additive genetic effects (dominance and epistasis), genetic advance will be low, while in cases where heritability is chiefly due to additive gene effects, a high genetic advance may be expected. Therefore, high heritability and high genetic advance for NF/P, TY/P, PH, INL, NFF and AFW indicated prevalence of additive genetic effects and good response to selection. Hence, it is advisable for straight phenotype based selection to improve these characters. High heritability coupled with low GAM was observed for DFH, FSG, FL and FG is the sign of prevalence of non-additive gene action and favourable influence of environment as a result limited scope for improvement through selection procedures. Correlation co-efficient In the present study correlation analysis revealed the mutual relationship between characters. Genotypic and phenotypic correlation coefficients among yield and yield affecting characters are presented in Table 3. In most of the cases, genotypic correlation coefficients were found to be higher than corresponding phenotypic correlation coefficients. This reflects the character expressions had been appreciably influenced by genetic reasons rather than the environmental effects. The low phenotypic value might be imputed to differential interaction of the genotypes with the environment. Higher magnitude of genotypic correlation coefficients compare to their corresponding phenotypic correlation coefficients were found in earlier studies of Kumar and Yadav (2009) and Niranjana and Mishra (2003). Out of 15 characters studied PH, INL, NB/P, AFW, NF/P, MY/P and NR/F showed positive genotypic correlation with TY/P. This indicated that fruit yield can be improved by making selection on the basis of these characters. Positive association of PH, INL, NB/P, AFW, NF/P and MY/P with TY/P also reported by Nagre et al. (2011), Mihretu et al. (2014), Bendale et al. (2003) Hazra and Basu (2000) and Sreenivas et al. (2015). Negative correlation was observed for TY/P with DFF, DFH, NFF, FSG, FL and FG. This indicates that prioritising selection of genotypes showing early flowering at lower number of node and giving optimum marketable sized tender fruit will help in improving fruit yield of okra. Negative correlation coefficients for above characters also reported by Saryam et al. (2015), Singh et al. (2006), Nagre et al. (2011) and Hazra and Basu (2000). However, positive genotypic correlation of FL and FG with TY/P as reported earlier by Mihretu et al. (2014) and Saryam et al. (2015) were found to be in contrast with finding of present study for. These discrepancies may be due to population specificity of results.

TABLE 3: INDICATING SIGNIFICANCE OF VALUES AT $P=0.005$ & $P=0.01$, RESPECTIVELY

- Genotypic and phenotypic correlation of 15 quantitative traits in okra .

CONCLUSION

The traits NFF/P, DFH, FSG, FG and NR/F showed high genetic variability. NF/P, PH, INL, NFF, AFW and TY/recorded high heritability with high genetic advance as per cent of mean indicating the prevalence of additive gene action in their inheritance denoting the selection based on these traits to be quite effective, when research was conducted at Loyola academy agriculture farm, In association the study of the traits, PH, INL, NB/P, AFW, NF/P and MY/P being positively correlated with TY/P could be used as traits of interest for indirect selection to improve yield in further breeding programme.

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INFLUENCE OF NATURAL FARMING ON GROWTH AND YIELD OF PALAK (*Beta vulgaris var. oleracea*)

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ABSTRACT

The concept of zero budget natural farming came into limelight by *Mr. Subhash Palekar* who has made a deep study of the natural cycles of the ecosystem, relating them with our ancient indigenous practices and formulated a variety of cow and plant based botanicals. He verified natural processes of the forest on his farm for six years (1989 to 1995). In his book “*The principles of Zero Budget Natural Farming*”, Mr. Palekar has clearly given the differences between organic farming (which is a western concept) and Natural farming. Natural farming is purely based on botanicals and *desi cow* products which are liquified and applied as *inoculum* to the soil. Mr. Palekar has also explained the importance of *desi cow* and its products which have medicinal as well as agricultural uses. In Natural farming, there are many types of botanicals namely *Bijamrutham* (used for seed treatment), *Jiwamrutham* (nutrient enrichment solution), *Waphasa* irrigation (waphasa means the mixture of 50 % air and 50 % water vapor in the cavities between the soil particles), and for plant protection also there are botanicals like *Neemastram* (sucking pests), *Agniastam* (leaf rollers and stem borers), *Shilindranashini* (natural fungicide) etc. Inspired by this concept, a field experiment was conducted on the influence of natural farming practices on growth and yield of Palak (*Beta vulgaris var. oleracea*). This experiment was conducted in the field near Shamshabad under the guidance of a farmer Ms. Lavanya. The treatments of the experiment consists of: seed treatment with *Bijamrutham* @1 Litre per kg of seeds and *Jeevamrutham* @500 Litres/ ha were given. For plant protection, *Neemastram*@200L/ac and *Dashaparnikashayam*@100L/ac were applied. The results of the experiment showed that seed germination percentage was increased upto 90% compared to control (65%). The results showed that treated seedlings on an average had a length of 24.5cm whereas non treated seedlings had 18 cm. The leaf area of treated plants on an average was 16200 cm²/m² and 9800 cm²/m² in case of non treated plants (65% more leaf area). The crop was healthy without pest and disease attack in the *Neemastram* and *Dashaparnikashayam* applied plots compared to non treated plots. The herbage yield on an average was a 10 tonnes per hectare for treated plants and for non treated plants it was around 8 tonnes per hectare. The yield was increased by 25%.

Key words: *Natural Farming, Desi Cow, Inoculums, Bijamrutham, Jiwamrutham, Neemastram, Palak, Growth, Yield.*

“**Zero Budget Natural Farming**” is a holistic method of farming in which the production cost will be zero. In the ZBNF nothing has to be purchased from outside, all things required for the growth of the plant are available in the root zone of the plants. It is both eco friendly and economically viable. This concept was propagated by Mr. Subhash Palekar. The concept makes *desi cow* products as the supremely important components in making any kind of botanicals. In order to make the unavailable nutrients into available form, *Desi cow* dung and urine play a vital role which contain miraculous beneficial microbes (one gm of *desi cow* dung contain about 300 to 400 crores beneficial microbes). Important microbes present in *cow dung* are nitrogen fixing nitrogen species, *Acetobacter*, *Azotobacter*, *Azospirillum*, and so many species of phosphate solubilising bacteria (PSB) and also potash solubilising bacteria. One of the important methods in Natural Farming is the seed treatment with ‘*Beejamrutha*’ which is used to treat the seeds and seedlings and thereby protects the crops from pathogens. The composition is water, *Desi cow* dung, *cow urine*, soil and lime. The other seed protection methods are treated with ‘*Jeevamrutha*’, a nutrient and also a catalyst for one time application. The composition of this mixture is water, *cow dung*, *cow urine*, *jaggary*, flour of any pulse and soil. Mulching reduces tillage labor requirements, suppresses weeds, promotes humus formation and enhances water holding capacity of the soil. Fungicides and insecticides prepared from this method contains *butter milk*, *desi cow* milk, *black pepper powder* and water, *cow dung*, *neem seed powder*, *tobacco powder*, *garlic paste* and *green chilly paste*. This is prepared by the farmer and applied it whenever it is applicable. All these botanicals can be easily prepared with very less inputs which is affordable by any small farmer.

MATERIALS AND METHODS

A field experiment was conducted on Palak to study the effect of natural farming practices on growth and yield of palak crop at Hemajipur village in a farmer’s field (Mrs. Lavanya) at Shadnagar, Ranga Reddy District. The experimental field soil had a pH of 5.5 which is acidic. The texture of the soil is red loam. The experiment was laid out into two plots measuring 1x1 m each. The treatments consisted of T₁ (Natural botanicals given) and T₂ (control). In T₁ plot the seeds were treated with *Beejamrutham* @1L/kg of seeds and the soil was treated with *Jeevamrutham*@ 500L/ha (applied once in a month). For plant protection *Neemastram*@ 200L/ac (1 L of *Neemastram* mixed in 20L of water, applied twice in a month) and *Dashaparnikashayam*@ 100L/ ac (1.5 L of *Dashaparnikashayam* per 20 L of water, number of applications depend on the severity of pest attack) were also applied in the later stages of the crop growth. T₂ plot was kept untreated to compare the results with T₁ in terms of growth parameters and herbage yield.

Beejamrutham is prepared by wrapping 5 kg *cow dung* in a cotton cloth dipped in 20 L water taken in a container. The next day the cloth is squeezed to get the extracts of *cow dung* in water. In that extract 5 L of *cow urine*, 10 ml of lime solution and a handful of soil is added. Soak the seeds in *beejamrutham* for a day and then dry the seeds to sow them the next day. The *beejamrutham* eliminates the risk of seed borne diseases. **Jeevamrutham** is a nutrient enrichment solution which is prepared by mixing 10L of *cow urine*, 10 kg of *cow dung*, 2 kg of *jaggery*, 2 kg of *besan* and a fistful of chemical

free bund soil in 200L water kept in barrel. It is stirred well in clock-wise direction, fermented for 48 hrs. It can be applied through irrigation channels or sprayed @ 10%. **Neemasthram** is prepared by mixing 5 kg of cow dung , 5kg of crushed neem leaves and 5L of cow urine in 100L of water in a barrel which is stirred and kept for 24 hours. It can be filtered and sprayed @ 5% to avoid sucking pests. **Dashaparnikashayam** is prepared by mixing 5 kg cow dung, 5 L of cow urine, 3 kg of green chili paste, 3 kg of crushed leaves of neem and crushed leaves of ten different types of trees (2 kg each) in 500 L barrel .It is stirred twice a day. It is ready to use after 40 days. It eliminated all types of pests.

RESULTS AND DISCUSSION

Data recorded on germination %, vigor , growth components and herbage yield are presented in table -1.

Germination %: It was observed that out of 100 seeds 90 germinated in case of treated sample whereas only 70 in case of non treated sample. The germination percentage was 70% for non- treated whereas for treated it is 90%. The germination percentage was increased upto 20%

Vigor : The treated seedlings had a length of 13.0 cm whereas the non treated seedlings had a length of 8.0cm. The treated seedlings were dark green whereas the non treated seedlings were lighter in color. There was an overall increase of about 5cm in length when treated with botanicals.

Leaf area: Under field conditions, the leaf area of treated plants on an average was 16200 cm²/m² and 9800 cm²/m² in case of non treated plants (65% more leaf area).

Biometric observation (at 40 DAS): Under field conditions, the height of treated plants was about 24.5cm whereas in case of non treated plants, the height of the plants was 18.0cm. The treated plants had more number of leaves (12 leaves/plant) whereas the non treated plants had 8 leaves per plant.

Yield: The herbage yield on an average was a 10 t/ ha for treated plants and for non treated plants it was around 8 t/ha. The yield was increased by 25%. It was also observed that the crops treated with botanicals were healthy as compared to the non treated crops.

Tab-1: Effect of natural farming of practices on germination, growth and yield of palak

Parameters	T ₁ (Treated)	T ₂ (Non-treated)
Germination %	90%	70%
Vigor test	Green color seedlings, 13.0cm	Pale green, 8.0cm length
Biometric observation (at 40 DAS)	12 Broad leaves, plant length 24.5 cm length	8 Small leaves, plant length 18.0 c
Leaf area (cm ²)	16200 cm ² /m ²	9800 cm ² /m ²
Herbage Yield (t/ha)	5.0 t/ha	3.5 t/ha

Farmers of India should choose zero budget natural farming. From the above field experiments, we learnt that it is better to practice natural farming instead of going for chemical farming. This will not only stop the degradation of land with chemicals but also the business of multinational companies providing agriculture inputs in India will go down. This will strengthen our economy and also ecology.

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SMART FARMING TO RAISE THE STANDARD OF LIVING OF FARMERS

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ABSTRACT

The present study was undertaken with a view to identify and analyze the magnitude of crop production and its sources with special emphasis on the role of modern technology. Farmers make decisions based on the information they have on hand, which is why data has helped them harness the power of information to make better informed decisions that allow them to use resources more sustainably. This serves as a digital platform that brings together data collection, production analysis, agronomic modeling, field monitoring etc., which gives farmers a better understanding of their fields. These tools allow the farmers to plan for better harvest and make decisions that are better for planet. Farmers require on-going education to stay aware of fast moving developments in science, business management and technologies in agriculture including the access of internet at their homes so that when the produce is at a pre-harvesting stage farmers can notify the consumers so, immediately after the harvest the order can be transported with cryopreservants to the consumer directly. This is a win-win situation for both the consumers and the farmers of these agricultural products. Consumers get these products while still fresh and the farmers will sell all the products as the demand is high to increase on their RIO>Returns On Investments. This helps in preventing the interference of third party between farmer and the consumer who generally loots the farmers income. Adopting various technologies like GM plant material, organic farming, fertigation, sophisticated machinery, AI, GPS Technology etc. helps in facilitating the transition from conventional farming to modern farming. It aids in making sound financial management decisions and discover new economic opportunities.

Key words-modern technology, digital platform, cryopreservants, modern farming.

INTRODUCTION

Agriculture occupies a very important role if the growth of economy of our country, which is also the backbone of economic system. India is primarily an agricultural country. The prosperity of the Indian economy is dependent on the course of Agricultural production. Of course, agriculture contributes the major share of the national income of India. In India, agriculture meets almost the entire food requirements of the people. Agriculture also provides fodder sustain in livestock whose number runs to several crores. Indian agriculture is going to visualize technology-led agriculture with nanotechnology, genetic engineering, geographical information system(GIS), information and Communication Technologies(ICT), weather based forecasting and also, the human resource management to garner benefits from these technologies.

A VIRTUAL MARKET PLATFORM FOR FARMERS-ICT

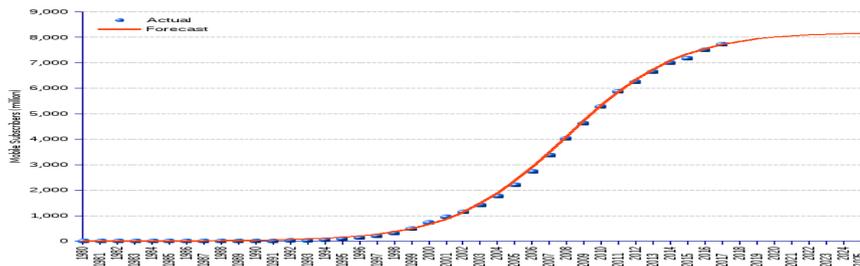
Indian agriculture is a complex enterprise involving millions of small and marginal farmers. Many of them are illiterate, resource-poor and have little or no access to modern technologies. Knowledge management (KM) is therefore a very challenging task in Indian agriculture. Unless everyone connected with agriculture is brought to a common platform for sharing and refining information, finding solutions to local problems through crowd sourcing information is not easy. With the recent advances in information and communication technologies (ICTs), connecting people on a common knowledge platform is not that difficult in technical terms.

It also empowers poor farmers with information and communication assets and services that will increase their productivity and incomes as well as to protect their food security and livelihoods, and to harness ICTs effectively to compete in complex, rapidly changing global markets.

As agriculture has become more complex, farmers' access to reliable, timely, and relevant information has become increasingly important. Farmers require access to more varied, multisource and context-specific information, related not only to best practices and technologies for crop production and weather, but also to information about post-harvest aspects, including processing, marketing, storage, and handling. Generalized content often made available through web-portals and other ICTs often has very little value to farmers who cultivate crops in varied agro-ecological settings. Information that is context specific rather than generic could have important impacts on the adoption of technologies and could increase farm productivity for marginal and small agricultural landholders.

Despite the potential cost and time associated with generating localized content, access to locally contextualized quality content is more relevant for the poor and more useful to their information needs reliable, easily available, quality content that is relevant for farmer decision-making could also reduce information-seeking and learning costs more-specialized applications, such as software used for supply chain or financial management are also becoming more relevant in smallholder farming. Simple accounting software has allowed cooperatives to manage production, aggregation, and sales

with increased accuracy. Along with electronic administration, the coop plans to invest in Global Positioning System (GPS) technology to obtain certifications and use cameras and video as training materials to raise the quality of production.



Source: International Telecommunications Union

FARMER IN COMMODITY MARKET

Generally, the middlemen and wholesale businessmen purchase the Agricultural products from the farmers at a lower price. They also get the commission from the farmers for the transactions made. In turn, fresh vegetables and fruits purchased at the lower price from the farmers are sold out to retail businessmen at higher price and the retail businessmen sell those Agricultural Products further at higher price to the consumers. As a result, the farmers get only the lower price for their produce whereas the consumers have to pay higher price for the same products.

Government tries to protect the interests of the poor Indian farmers by procuring crops at remunerative prices directly from the farmers without involving middlemen in between. This way Government maintains sufficient buffer stocks and at the same time provides the farmers safeguard against the fluctuating food crop prices. But government at the same time has restricted this traditional sector by fixing prices of crops at a particular level and also by imposing several other restrictions on export and import of agricultural commodities. All these restrictions prevented this sector to move out its traditional features. So according to many economists liberalization of this traditional agricultural sector could have been of great benefit to our economy. But questions will naturally come up about the maintenance of buffer stocks and provisions of remunerative prices to the farmers. In absence of government's intervention farmers will not be getting any prior information about the future markets of their products. Naturally a sudden price crash of food crops will have devastating effects on farmers. Here comes the significant role of futures market. If the buyers in the commodity market anticipate shortage of a particular crop in the coming season, future price of that crop will increase now and this will act as a signal to the farmers who will accordingly plan their seeding decisions for the next season. In the same way, an increase in future demand of food crops will be reflected in the today's price in futures market. In this way the system of futures market can be of great help to the Indian farmers preventing them from being directly exposed to the unexpected price changes all of a sudden. It also helps towards evolving a better cropping pattern in our country.

If the peasants are farming some crop now and are very much concerned that price will crash by the time the crop comes in, then if there is futures market, they will have the option to sell their products in it. Price in the future markets being fixed; by selling products in future markets they get rid of their worries about the about the unexpected price fall. This helps them to take the risk of innovations, by using new high yielding varieties of seeds, fertilizers and new techniques of cultivation. Futures Market will act as a smoothing agent between the present and future commodity market. If the price, which is going to prevail in future, is high compared to what is it now, then the arbitragers would like to buy the commodities now to sell those in future. The reverse process is also true. So the existence of a futures market is always good for any economy. It opens up a new opportunity to people to protect themselves from unexpected risks.

GM TECHNOLOGY

GM crops currently on the market are mainly aimed at an increased level of crop protection and production .The development of GM technology that delays ripening of fruit and vegetables, thus allowing an increased length of storage. Farmers would benefit from this development by increased flexibility in production and harvest. Consumers would benefit by the availability of fruits and vegetables in fresh form. In many cases small-scale farmers suffer heavy losses due to excessive or uncontrolled ripening or softening of fruit or vegetables.

GPS TECHNOLOGY

The GPS (Global Positioning System) and GIS (Global Information System) have advanced quite well in last few years. Farm equipment manufacturers have developed several GPS tools to help farmers and agribusinesses become more productive and efficient in their precision farming activities. Pest problem areas in crops can be pinpointed and mapped for future management decisions and input recommendations.

SOPHISTICATED MACHINERY

The most advanced agricultural technologies employed today are: Tractors on autopilot, Swath control and variable rate technology, your tractor is calling, your cow is calling tool, Irrigate via smartphone, sensing how your crop is feeling

Future of agriculture is expected to be highly promising due to significant use of technology in farming. But however, developing and poor nations still lag behind in using such robots and are rather highly dependent on manual methods of farming. But use of such equipment and robots is definitely increasing in such countries due to rising trend of mechanization and modernization in developing nations.

CONCLUSION

India needs to raise the level of productivity and quality standards to international levels, which is one of the major challenges. However, recent reports states that agriculture plays an important, though declining role in Indian economy. Its contribution in overall GDP fell from 30 % in the early nineties, to below 17.5 % in 2006 and even more less in the recent years. As mentioned earlier, for a large majority of farmers in different parts of the country, the gains from the application of science and technology in agriculture are yet to be realized which would require infrastructural support, improved technologies and provision of inputs at reasonable cost. In contrast, where costs are reduced by research and improved infrastructure, agriculture can attain growth rates of at least 50 percent higher than in the past. That would have powerful multipliers to the rural non-farm sector, thereby reducing poverty, increasing employment, and increasing food security.

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USE OF MODERN MOLECULAR TOOLS IN MANAGEMENT OF TEAK (*TECTONA GRANDIS*L.F.)

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Introduction

The use of molecular tools for parentage analysis has been evolving for over a decade now. The advent of DNA fingerprinting in the 1980s led to a surge in parentage analyses, primarily in birds, that revealed the power of such studies to overturn existing paradigms in behavioural ecology (Birkhead & Moller, 1992). Then came the most important technological breakthrough i.e. the introduction of microsatellite markers to molecular ecology, an advancement that was accompanied by a proliferation and refinement of statistical techniques for the analysis of parentage data (Jones *et al.* 2009). Molecular markers have been successfully used in plants to study mating systems and gene flow in natural populations and orchards. Molecular markers provide a direct method to assess contemporary gene flow by way of identifying parents of progeny arrays. Microsatellite markers, because of their hyper-variability, co-dominance and mendelian segregation, have proved to be the marker of choice for studying contemporary gene flow and mating system in natural forests (Prabha *et al.*, 2011; Dow and Ashley, 1996) and breeding pattern in seed orchards (Grattapaglia *et al.*, 2004). Contrary to the observational methods that only measure dispersal, molecular markers measure successful gene flow (Cain *et al.*, 2000). The present study was taken up in a *Tectona grandis* clonal seed orchard, located in Telangana, to assess the mating system and gene flow within the orchard.

Materials and methods

The study site is located at the Forest Research Station, Achuthapuram Warangal. Genetic material in the form of fresh terminal leaf (about 200 mg) was collected from all (307) retained ramets belonging to thirty clones. About 100 open-

pollinated fruits were collected from five seed bearers representing five clones. Fruits were germinated and following which leaf samples were collected from half-sib progeny arrays. Genomic DNA of each collected sample of *Tectona grandis* was extracted using the cetyl trimethyl ammonium bromide (CTAB) protocol of Doyle and Doyle (1990). Following a primer screening experiment, four microsatellite primers (CIRAD3TeakB02, CIRAD3TeakF01, CIRAD4TeakDA12 and CIRAD4TeakF02) developed by Verhaegen *et al.*, (2005) were selected for genotyping of the parents (307 nos.) and progeny arrays (105 nos.). PCR amplified microsatellites were separated on non-denaturing polyacrylamide gel (5 or 7%), run at constant current (30 mA) for 2 hour 45 minutes, alongside a DNA ladder. The gels were post-stained with GelStar Nucleic Acid Gel Stain following manufacturer instructions. Gel images were captured in a Syngene GelDoc system. Then, alleles were scored at each locus taking into account the allelic range at those loci (Verhaegen *et al.*,

2005). Maximum likelihood approach was adopted to find the single most likely pollen parent (father) for each of the focal offspring with known seed parent (mother). The pollen dispersal distance i.e. straight line distance between known seed parent and the identified pollen parent was calculated using the Pythagorean Theorem.

Results and Discussion

Paternity analysis with maximum likelihood approach identified the most likely pollen donors for 61 progenies (58.1%) with 95% confidence level. Out of the 61 progenies for which paternity could be established with 95% confidence, only four progenies were selfed (6.6%) and rest was the result of cross-fertilization (93.4%). This high outcrossing rate in Teak is in agreement with Prabha *et al.* (2011), who had reported 96.1% cross-fertilization in a natural Teak forest in the Kerala state of India. Kjaer and Suangtho (1995) had reported outcrossing rate of 89-95% in Teak using isozyme markers.

Spatial analysis of known seed bearers and identified pollen donors revealed pollen dispersal in all directions of the orchard (Figure 1). The average pollen dispersal distance to five focal seed bearers varied from 84.0 ± 18.8 (SEM) m to 153.4 ± 14.2 m (SEM). Further spatial analysis revealed that 80.7 % of the pollen donors were beyond 50.0 m of the seed bearers, whereas, only 19.3 % pollen donors were within 50.0 m from the seed bearers.

Though cross pollination did not seem to be a problem in the present study, however, the low amount of viable seed production per seed tree indicated that such cross pollination events are very less in number. Insufficient pollination and high incidence of selfing events might be some of the reasons for low fruit productivity. Teak has early-acting self-incompatibility during pollen tube entry into the ovule through the micropyle (Mohandas *et al.*, 2002), as a result of

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OPPORTUNITIES AND STRATEGIES FOR DOUBLING FARMERS' INCOME

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Abstract: Doubling farmers income is a broad term associated with various dimensions and strategies. Increasing the farmer's income is simultaneously related to increase in the crop production which also increases the standard of the country by contributing more shares than the past in GDP. Though, agriculture sector in India has witnessed drastic changes after introduction of modern technology during green revolution which received a significant uptrend during that reign, still small and marginal land holding farmers who contribute about 85 per cent of farmers in India are still not receiving enough and come to meet their daily requirements.

The central government has recognised the need of Agri-tech start-ups partnership for doubling the farmers income of our country by 2022. As a part of this, Agriculture Grand challenge was initiated. Government of India invited the interested entrepreneurs and start-ups companies to come forward to find out solutions for the problems and challenges faced by farmers in 12 key areas. The central government is also ready to provide financial assistance for the start-ups in this matter.

Introduction

3.2 lakh farmers have committed suicide in the last 20 years. Every half an hour a farmer is taking his life in the process of producing food for all of us. Farm crisis, farmer suicides, pesticide poisoning, land grab and several other issues pushing farmers into taking their lives. But, all the underlying issue is low income of farmers. Year on year, income level is deteriorating. We need a sustainable and effective solution to increase the income of farmers so that economic growth is established.

Farm income is the excess of income from the sale of farmers produce over his expenditure incurred on producing the same.

The three main components are

1. Maximization of revenue
2. Minimization of cost of input
3. Development of alternative sources of income

MAXIMIZATION OF REVENUE

Crop selection

Every crops price is a function of global demand, supply, inventory levels, currency rates, trade flows, freight rates, interest rates, government policies and local politics. With a view of accessing the same, it is proposed that a national crop planning bureau be set up, with a mandate to develop understanding and competencies on each of India's major crop. This will ensure that the farmer does not over produce or wrong crop at the cost of foregoing profits on another crop.

Further, we need to ensure that India creates Global competency and a few crops. India's agri infrastructure is geared towards procurement, and movement of wheat and rice.

Yield maximization

Crop production has to meet the growing population. Each crop has a research centre in India, which works on testing multiple varieties of seed, rate also needs to improve in India, so as to ensure continuous enhancement of yield levels.

Minimization of costs of input

- Ensuring zero tax on all participants of the value chain of manufacturing the input so as to have a low end cost of finished products, ensuring early release of subsidies to the companies or the farmers.
- Continued priority sector lending rate benefits
- Ensuring adequate availability during peak season to avoid black marketing
- Rationalized subsidy calculation mechanism which negotiates net back dilution on account of freight charges.
- Energy should ensure that all farms shift to solar irrigation pumps

Logistics

An unseen component of overall crop Economics is the cost of logistics of marketing the produce. The cost of transporting higher volumes leads to lower per tonne cost of transportation.

Alternate sources of income

Dairy and livestock

The government should establish formal breeding centres and subsequent sale of such cows and buffaloes to the farmers.

Encouraging livestock farming - the share of income from farming of animals group in the most of the world. From 4.3 per cent In 2002-2003 to 11.9 per cent in 2012 - 2013.

The livestock sector globally is highly dynamic. In developing countries, it is evolving in response to rapidly increasing demand for livestock products. In developed countries, demand for livestock products is stagnating, while many production

systems are increasing their efficiency and environmental sustainability. Historical changes in the demand for livestock products have been largely driven by human population growth, income growth and urbanization and the production response in different livestock systems has been associated with science and technology as well as increases in animal numbers. In the future, production will increasingly be affected by competition for natural resources, particularly land and water, competition between food and feed and by the need to operate in a carbon-constrained economy. Developments in breeding, nutrition and animal health will continue to contribute to increasing potential production and further efficiency and genetic gains. Livestock production is likely to be increasingly affected by carbon constraints and environmental and animal welfare legislation. Demand for livestock products in the future could be heavily moderated by socio-economic factors such as human health concerns and changing socio-cultural values. There is considerable uncertainty as to how these factors will play out in different regions of the world in the coming decades.

Livestock production performance has been more impressive than that of food grain production. Milk, egg, meat, and fish showed impressive growth rates of 5 to 10 per cent. The minimum targeted growth rate for attaining self-sufficiency in milk, fish, meat and egg by 2001 AD are 5.54, 6.25, and 5.54 per cent per annum respectively.

Livestock represents the only way in which the natural vegetation that covers large parts of India can be converted into products that can be used by man. It provides draught power and manure to the crop enterprise and this in turn provides feed and fodder. The value of output from the livestock sector was Rupees 79684 crores in 1994-95 which was 9.3 per cent of the Total (GDP).

Fortunately India is blessed with a tremendous livestock wealth. It has the largest population of cattle and buffalo in the world and its breeds are admired for heat tolerance and inherent resistance to diseases and ability to thrive under different climatic conditions.

The cattle population of India is very large. According to 1991 census the cattle population was estimated at 467.9 million this comprised of 203.1 million cattles, 83.1 million buffaloes, 50.7 million sheep, 115.3 million goats and 12.1 million pigs. The others were estimated at 3.6 million. The poultry population constituted a 400 million.

Milk production:

India ranks first with the average milk production of 78 million tons per annum. This has been the achievement of 70 million dairy farmers and also through the strident efforts of the animal husbandry practices, cattle cross breeding projects and cooperative dairy farming. It is worthwhile to mention that the per capita availability of milk to the lacto vegetarian Indians is estimated at 214 grams per day. It has been the only source of sufficient energy, minerals, vitamins and animal proteins. A 60 per cent of the total milk production enters into the market in the form of dahi, butter, ghee, khoa and shrikhand. Besides this the conventional dairy products including milk powder, Ice cream and cheese are also manufactured. During last 20 years the supply of milk has been possible in sufficient quantities through the pasteurization plants and chilling units.

Animal draught power:

The bullock pair may be regarded as the backbone of Indian Agriculture. Though the animal draught power does not relate with human nutrition directly. Indirectly it contributes in the production of food grains; the renowned draught animals (cattle and buffaloes) include Khillar, Amrit mahal, Hallikar, Red kandhari, Ongole, Malvi, Rathi, Nagore, Neman, Hariyana, Gir, and Deoni. There are about 86 million draft animals, which comprise of 76 million bullocks, 8 million buffaloes, 1 million camels and donkeys. The horsepower obtained from 1 bullock is equivalent 0.75 H.P.

Mechanization in Agriculture has been to the tune of 20 per cent only. Whereas 80 per cent of the agriculture/farm operations are done by bullock drawn implements. It is estimated that 40,000 megawatts, of Energy (Traction power) is made available through the use of draft animals and the value of this has been estimated Rs.5000/- crores.

Meat production:

Flesh foods are rich in protein and are good sources of vitamin B12 which is absent in plant food. India's meat production is hardly 2 per cent (4.08 million tons) of the global meat production 209.31 million tons in 1995. Out of total meat produce in India 54 per cent is from mutton and chevon, 26 per cent from beef 13 per cent from chicken and 7 per cent from pork. Even though 70 per cent of India's populations consume meat the per capita availability of meat is less than 5 kg per year. As compared to world's average of 14 kg per year.

Broiler production in India is recent one rearing poultry for meat purposes started only in seventies, but the growth is significant Broiler production which was only 4 million in 1971 increased to around 215 million in 1991.

The poultry industry has achieved a spectacular growth during last thirty years. The 24 billion eggs produced in 1991 represented 13 fold increase compared to 1951. With the annual production of 27 billion eggs (1995-96) India stands fifth in world. The government has promoted the poultry development through intensive poultry development project (IPDP) launched in third five years plan, (1969-74). Improved breeds like RIR, WLH and Australia. The per capita availability of eggs in India is only 30 per annum as against the ICMR recommendation of 180 per year.

Fish production: Fish is a cheap source of animal protein and a good source of calcium. The fish production of India has risen to 4.95 million tons in 1995-96. The per capita availability of fish in 1996 was 5.4 kg whereas the ICMR recommendation for total meat including fish is 10.95 kg per annum.

Farm yard manure for organic farming:

A minimum of 10-20 kg dung is obtained on an average from every cow or buffalo. This is an excellent source of F.Y.M. or compost manure. This is badly needed to improve the inherent soil fertility, and to have the extended manorial effect on the crops parts. Dung cakes are utilized as a source of fuel in rural parts of India. It is estimated that 640 million tons of cow dung is being utilized to meet the house hold fuel requirements. Besides the cow dung, goat excreta, and poultry dropping can also be better utilized for organic manure.

Areas to give awareness to the farmers for enhancing their income

Enabling Information and Communication Technology (ICT)- critical weather predictions help farmers to sow the seeds at right time. Farming practices enable farmers to utilise the declining natural resources more efficiently. Market data information helps farmers to get the best selling price for their crops and helps avoid distress sale.

A plan to double farm incomes needs to be implemented by all state governments, irrespective of their political affiliations so as to ensure that India becomes a fully developed country in the next 50 years.

Indian agriculture has grown at less than 2 per cent CAGR in the last 5 years, to alleviate the distress farmers income needs to increase substantially

1. Better seeds, better income - From 1960s - 1990s, improved seeds innovation increased productivity of crops. Example wheat by 177 per cent, rice by 76 per cent. From 2002 - 2015 bollgard cotton, first Biotech crop increased cotton productivity by 66 per cent. Introduction of maize hybrids (single cross) in India improved means productivity from 1.9MT/ hectare in 2004 to 2005 to 2.5MT/ hectare in 2013 to 2014.
2. In India more than 50 per cent of the cultivable land depends on rainfall for its irrigation to the crops. As a result productivity tends to be very low. To address the weather related risk the recently announced new Crop Insurance Scheme is providing subsidy on almost 80 per cent insurance affordable to farmers making dependent on vagaries of nature. Micro irrigation helps save water and increase productivity. It is noticed that in crops like cotton it is up to 20 per cent, in sugarcane up to 39 per cent, in groundnut up to 73 per cent and vegetables up to 31 per cent.

Financial literacy

There is a need to take financial literacy through trusted sources like the LIC or post offices to the villages so that the larger population of the country also becomes a prime participant in the economic growth.

Online Trading

If usage of good viable seeds, judicious application of fertilizers, proper management practices are on one side, selling or marketing the harvested produce stands on the other vital side where the farmer gets his actual income. Farmers should opt for community organic farming where the produce can be sold at a relatively higher price and also the fertilizer cost can be cut down. Farmers should be educated with regard to access of internet at their homes so that when the produce is at a stage right before the harvesting they can notify the exact duration so immediately after the harvest, the order can be transported to the consumer directly. This way the farmer can sell his produce at the desired profitable rates which he wants and the consumer directly receives goods without the interference of third party who generally deceive the farmers. There are several mechanisms like cryopreservations and usage of natural hormones to conserve them from damage and decay.

Crop Insurance

Crop Insurance the current models of Crop Insurance factors basis rainfall, temperature and crop loss. However, a more robust model should take into account losses on account of pest attacks, quality deterioration.

Job insurance

There are newer insurance products which insure jobs. The overall family income of a rural household also has a component of a non-farm job income from the informal economy (drivers, office boys, mechanics, salesman, cleaners). This employment needs to be formalized and job losses prevented through social security programs.

Population control

The root cause of India's farm woes are small land Holdings, a consequence of our expanding population. Start needs to be made for a one child programme, which can halve India's population from the current 1.2 billion to 500 million by 2100.

Present Trends

As a result of various dairy development programmes the country is having presently 233 processing plants and 46 milk products factories. The cooperative public sector plants and organized private plants have an estimated handling capacity of 8.65 million liters per day (MLPD). Various cattle improvement projects have been started in 600 community blocks. The country has now 122 intensive cattle development programmes (ICDP) 140 cattle breeding farms, 40 Exotic cattle farms and 48 frozen semen banks in operation. These activities have resulted in enhancing the milk production by 494.11

per cent in the past three decades although increase in breedable cows and buffaloes 22-23 per cent during the same period. Through a network of over 4200C milk producers cooperative organized under the operation float. Programme, a National milch grid has been successfully established. This grid covers besides the four-metropolitan cities. Nearly 200 cities and towns. The fallen and slaughtered cattle and buffaloes also contribute hides and skins, bones and hooves etc. The hides and skins, from cattle and buffalo are estimated at 0.82 million tons annually.

Employment generation:

Animal Husbandry & Dairying may be regarded as a source to create the employment in rural areas all-round the year. Indian Agriculture is mainly dependent on monsoon and hence agriculture field faces certain bottlenecks to provide employment during such periods. On an average Agriculture sector may provide 200 days employment to the rural persons. This means they have to find alternate source of employment for income during the rest of the year. Dairy farming, sheep and goat rearing, poultry production, pig farming rabbit rearing are the alternate sources of mix farming. It may be possible to generate the employment for the farmers as well as land less labourers who can do this job themselves, or it may be possible to employ young and the old family persons as a side business. Many of the operations in Animal Husbandry and Poultry Farming can be done by the rural women. It is estimated that on an average 35 million human years/annum employment generation has been potential through this sector.

Helping Farmers to Raise their Incomes

In some instances, access to mobile phones has been associated with increased agricultural income. A World Bank study conducted in the Philippines found strong evidence that purchasing a mobile phone is associated with higher growth rates of incomes, in the range of 11–17 per cent, as measured through consumption behavior (Labonne and Chase 2009). One reason for this finding is that farmers equipped with information have a stronger bargaining position within existing trade relationships, in addition to being able to seek out other markets. A study of farmers who purchased mobile phones found that average income increased by nearly 21 per cent Mobile phones seem to influence the commercialization of farm products. Subsistence farming is notoriously tenuous, but small holder farmers, lacking a social safety net, are often highly risk averse and therefore not very market oriented.

Although better market access can be a powerful means of alleviating poverty, the study found that market participation still depended on what producers had to sell: Perishable bananas were more likely to be sold commercially than less perishable maize. Mobile phones can serve as the backbone for early warning systems to mitigate agricultural risks and safeguard agricultural incomes. In Turkey, local weather forecasts transmitted through SMS provided very timely warnings of impending frosts or conditions that favoured pests. Mobile platforms may also have potential for enabling rural people to find employment. In Uganda, Grameen App Lab partners with government and NGOs to employ farmers to collect information This method, which relies on local people to transmit data to more centrally located research and extension staff, is much less costly and can provide much more timely information than traditional disease surveys. Txteagle provides employment for relatively educated users and even the very poor in rural areas could eventually benefit from access to a mobile job board. Farmers could advertise when they need additional labour for harvesting or other high-intensity tasks via mobile phone, creating a simple advertising portal. Workers could find jobs without wasting time and money travelling. A group called Baba Job is developing such a service in India, where recruiters and workers submit listings by SMS, but it remains in the developmental stage.

Mobile phones, in addition to other types of ICT, can overcome this problem by informing both producers and consumers of the prices offered for agricultural products in various locations. A number of studies have shown that when mobile phones are introduced to farming communities that previously lacked any form of connectivity, prices unify as farmers learn where they can sell for a better price. A striking example comes from the Indian state of Kerala. As mobile networks were rolled out in coastal regions, fishers who were previously ignorant of daily prices in different markets were able to contact various ports to find the best offer for their catch. The result was demonstrable welfare gains for fishers because fish were sold where they were more highly valued. Waste decreased and prices equalized throughout the regional ports; there were even small gains in consumer welfare (Jensen 2007). Other studies have confirmed this effect. Despite having the lowest mobile phone penetration in Sub-Saharan Africa, Niger has seen important effects on agricultural markets from mobile phone diffusion. As mobile networks have expanded, grain price differences have decreased by 20 per cent, traders' search costs have decreased by 50 per cent, scarce resources have been better allocated, and consumers have paid, on average, 3.5 per cent less for grain, which is equivalent to 5–10 days of grain consumption annually (Aker 2010a). A small study in Morocco found that farmers with mobile phones increasingly dealt directly with wholesalers or larger-scale intermediaries rather than smaller intermediaries (Ilahiane 2007). These studies, in conjunction with a host of anecdotal and theoretical evidence, point to the promise of mobile phones in making markets more efficiently.

Also technology has changed the agricultural industry by replacing human labour with machines that are operated or controlled by people or other machines. In the agricultural industry, productivity is a key factor. If production is high the farmer will make more profits so technology has helped farmers replace the old ways of farming with machines that can do the job in time right from the day of planting to the day of harvesting, example: An animal-drawn plow replaced the digging stick. Then later, that plow was replaced by the horse drawn moldboard plow. Currently, we have the large tractors

that pull complex tilling machines. But, even these machines are being replaced by no-till or minimum-till farming practices, which reduce the amount of work it takes to prepare the soil for planting.

The Budget of India is seventh-biggest on the earth by formal GDP and the third-largest by getting power equality. The agricultural division is important work in India's economy however donates to a declining part of its GDP (17 per cent in 2013-14). India grades second worldwide in farm productivity. Agronomy and related subdivisions resembling forestry, logging and fishing accounted on behalf of 17 per cent of the GDP plus employed 49 per cent of the overall employees in 2014. It is the prime employment source and an important part of the overall socio-economic improvement of India. Technology has transformed cultivating into an existent business, currently agronomists have electrified each method, a customer can submit a request specifically on the web, and the item will be transported from the plantation to the customer in time when it is still fresh. This protects the agriculturalist expenses and it removes mediators who tend to purchase low from farmers and sell high to end consumers. Each farmer utilizes this as per their convenience. Some people use it to produce fertilizers, some other people uses this technique to market their products, and others use it in manufacturing. Being as a farmer, they have to mention specifically what they need.

TECHNOLOGICAL SUPPORT TO THE FARMERS TO ENHANCE THEIR INCOME

Use of Machines on Farms

Presently an agriculturist can develop on more than 2 acres of land with fewer workforces. The use of planters and farmers creates the method so easy. In agriculture, time and production are so essential; you need to plant in time, harvest in time and transport to provisions in time. Recent agricultural knowledge allows a lesser number of people to cultivate huge amounts of food and fiber in a most limited timeframe

Modern Transportation

This aide in making yields existing on markets in time from the farm. With modern transportation, consumers in Dubai will consume new carrots from Africa around the same time that carrot lives the greenery enclosure in Africa. Current transportation innovation facilities help farmers effectively transport fertilizers or other farm items to their farms, and it likewise speeds the supply of horticultural items from farms to the business sectors where shoppers get them regularly

Cooling Facilities

These are used by agriculturists to supply tomatoes and other perishable yields to keep them fresh as they transport them to the business sector. These cooling facilities are connected in food transportation trucks, so crops like tomatoes will stay fresh upon conveyance. This is a win-win circumstance for both the customers of these agrarian items and the farmers.

Genetically Produced Plants

Like potatoes, can oppose sicknesses and pests, which compensates the farmer with great yields and spares them time. These harvests develop quickly and they produce healthy crops. Since these are impervious to most infections and irritations, the rancher will spend less cash on pesticides, which consequently increments on their (RIO) rate of return.

Development of Animal Feeds

This has undertaken the issue of chasing for grass to nourish creatures, now these encourages can be fabricated and devoured by creatures. The cost of this food is reasonable so that a low pay agriculturist can bear the cost of them. The vast majority of these produced creature nourishes have additional sustenance which enhance the creatures wellbeing and the output of these creatures will likewise increment. In farming, the strength of a creature will decide its yield. Ineffectively bolster creatures are constantly unfortunate and they deliver next to no outcomes in type of milk, meet, or hide.

Breeding of Animals which are Resistant to Diseases

The vast majority of these hereditarily delivered creatures will deliver more drain or hide contrasted with ordinary creatures. This advantages the agriculturist in light of the fact that their generation will be high. Cross reproducing is great in creature brushing; cross breed creatures are more solid and profitable.

Irrigation of Plants

In dry regions like deserts, agriculturists have grasped innovation to flood their products. A decent illustration is in Egypt, were ranchers use water pumps to gather water from streaming Nile to their yields. The majority of these agriculturists develop rice which needs a great deal of water, so they figure out how to develop this rice utilizing watering system techniques improved by cutting edge innovation. Propelled water sprinklers are being utilized to flood huge homesteads and this helps the harvests get enough water which is crucial in their development. A few ranchers blend supplements in this water, so additionally enhances the development of these yields.

12 key areas to increase agricultural productivity & doubling the income

The central government has recognised the need of Agri-tech start-ups partnership for doubling the farmers income of our country by 2022. As a part of this, Agriculture Grand challenge was initiated. Government of India invited the interested entrepreneurs and start-ups companies to come forward to find out solutions for the problems & challenges faced by farmers in 12 key areas. The central government is also ready to provide financial assistance for the start-ups in this matter. Lack of irrigation facilities, lack of investment capacity, increase in cost of cultivation, technology unavailability, due to this reasons there is no increase in agricultural productivity and also farmers are unable to get remunerative prices.

1. To conduct soil testing with simple procedures and recommending fertilizers based on test results for reducing cost of cultivation.
2. Providing remunerative prices to the farmers by strengthening the e-NAM system (electronic-National Agricultural Market).
3. Start-ups have to make efforts to develop e-markets.
4. Forecasting of prices for the farm produce during the crop period to save the farmers.
5. Start-ups should come forward with creative ideas, to give awareness about the agricultural projects of central and state governments.
6. Estimation of crop productivity with satellite based technology during the crop period.
7. To increase the efficiency of agricultural sector by reducing the crop losses.
8. Developing technology to control food adulteration.
9. Establishment of custom hiring centres to provide necessary agri-inputs and equipments and services.
10. To stop the burning of straw and find out its alternate uses.
11. To find alternate techniques to avoid harmful effects pesticides and to control the pre-harvest and post-harvest crop losses.
12. Low cost and simple technologies have to be adopted to increase crop productivity and to give greater dividends to farmers.

Conclusion

If income of agriculture is to be increased, allocation of expenditure to meet basic needs of the sector is important. Sufficient money must be made available for construction of tanks, Wells and lakes in villages to store water rather than spend to dams construction squandering money on contractors and corporates. Also, organic farming should be encouraged instead of GM cropping helping Monsanto industrialists. Support prices should be increased so that farmers get sufficient returns. Farmer oriented policies will only assist in boosting economy and employment in villages.

The low level of farmers income and year to year fluctuations in it are a major source of agrarian distress. This distress is spreading and getting severe over time impacting almost half of the population of the country that is dependent on farming for livelihood. Persistent low level of farmers income can also cause serious adverse effect on the future of agriculture in the country. To secure future of agriculture and to improve livelihood of half of India's population, adequate attention needs to be given to improve the welfare of farmers and raise agricultural income. Achieving this goal will reduce persistent disparity between farm and non-farm income, alleviate agrarian distress, promote inclusive growth and infuse dynamism in the agriculture sector. Respectable income in farm sector will also attract youth towards farming profession and ease the pressure on non-farm jobs, which are not growing as per the expectations.

About one third of the increase in farmers' income is easily attainable through better price realization, efficient post-harvest management, competitive value chains and adoption of allied activities. This requires comprehensive reforms in market, land lease and raising of trees on private land. Agriculture has suffered due to absence of modern capital and modern knowledge. There is a need to liberalise agriculture to attract responsible private investments in production and market. Similarly, FPOs and FPCs can play big role in promoting small farm business. Ensuring MSP alone for farm produce through competitive market or government intervention will result in sizeable increase in farmers' income in many states. Most of the development initiatives and policies for agriculture are implemented by the States. States invest much more than the outlay by the Centre on many development activities, like irrigation. Progress of various reforms related to market and land lease are also State subjects. Therefore, it is essential to mobilise States and UTs to own and achieve the goal of doubling farmers' income.

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EFFECT OF SPIRITUAL FARMING PRACTICES ON GROWTH AND YIELD OF PALAK (*Beta vulgaris var. oleracea* L.)

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ABSTRACT

The term spiritual farming can be referred to any agricultural operation which is done through divine vibrations (music, mantras or meditation). This concept was given by Sri Mataji Nirmala Devi (the founder of Sahaj Yoga Trust). In India it was first started in Maharashtra on a large scale in 2011. In 2015, ICAR has also given it a recognition. Inspired by this, an experiment was conducted on Palak crop (*Beta vulgaris var oleracea*) to differentiate the performance of vibrated and non vibrated crop plants. In this experiment two kinds of observations were made under laboratory and field conditions respectively. The field experiment was conducted on a farmer's field (Ms.Shobha Rani) located near Boduppall, Ranga Reddy District, to know the effect of spiritual farming practices on growth and yield of Palak. Under laboratory conditions observations like germination% and seedling vigor test were made. In this experiment two kinds of treatments were given to seeds and water .i.e. Vibrated plot and non-vibrated or control plot to compare the results. A sample of each input like seeds and water were taken and kept for vibration through meditation by sahaj yoga procedure. The results of this experiment showed that the germination percentage was 90% in case of vibrated seeds and 65% in case of non vibrated seeds under laboratory conditions. The vigor test shows that the vibrated seedlings had an average length of 11cm with average root length 1.5cm whereas in case of non vibrated seedlings the average length was noted 7cm and average root length 0.5 cm. Under field conditions, it was observed that the average leaf area was 12,400 cm²/m² in case of vibrated plants and 9400 cm²/m² in case of non vibrated plants. The vibrated plants were green and healthy without any pest attack compared to non vibrated crop plants. The herbage yield on an average was 5 t /ha in case of vibrated plot whereas it was 3.5 t /ha in case of non vibrated plot. There was an increase in the herbage yield by 47.82%. There is an overall increase in productivity and total production in case of Sahaj Krishi. Farmers do not need to spend much. Farmers are benefitted in two ways i.e. economic gain and spiritual balance and we can see our country becoming *Dhanya Bharat-Dhyana Bharat*.

Key words: *Divine vibrations, Carnatic Ragas, Sahaja Agriculture Project, Palak (Beta vulgaris var oleracea), Growth, Yield*

The term spiritual farming can be referred to any agricultural operation which is done through divine vibrations is Spiritual farming. Whether it is "Agnihotram" which is performed in order to purify the micro-atmosphere of the field ecosystem or any musical vibrations derived from *Carnatic Ragas* (Indian Classical Tunes) like "Amruthavarshini" which is believed to bring rain, or any kind of mantras, all produce a kind of *electromagnetic vibrations* which are supposed to be the main cause of bringing positive vibes. These electromagnetic vibrations have soothing effect on not only humans or animals but also on plants. Around thousands of years ago in our ancient texts like "Gowthami Samsthanam" by Lord *Budhha*, several examples were cited about these electromagnetic vibrations which nourishes life on Mother earth but the concept of spiritual agriculture was made practical recently by *Smt. Nirmala Chandrika Prasad Devi (founder-Sahaj Yoga)*. Under her guidance, a large scale of systematic field experiments involving more than 100 farmers in rural areas of the state of Maharashtra in India was launched in 2011 which has given rise to SAP (*Sahaj Agriculture Project*). The crops treated with vibrations showed 43% increase in plant growth in sugar cane, 20% increase in the sprouting potential of cotton seeds and a 50% increase in crop yield of sorghum. Therefore a second phase of experiment was launched on a national level in India from 2012 onwards with more than 15000 farmers being introduced to SAP. Based on these activities the apex body of Indian Agriculture ICAR (Indian Council of Agricultural Research) has given recognition to SAP in India. The SAP program is a zero cost solution which lets the rural farmers with limited resources in India to improve agricultural yields using the power of silent meditation and the vibrational energy. Key elements such as soil, seed and water are purified, enhanced and made more resilient without relying on artificial additives or chemicals. Inspired by this, an experiment was conducted on Palak crop (*Beta vulgaris var oleracea*) to differentiate the performance of vibrated and non vibrated crop plants.

MATERIALS AND METHOD

A field experiment was conducted on spiritual farming practices in Palak (*Beta vulgaris var. oleracea*) in Boduppall in a farmer's field, Mrs.Shobha Rani during kharif season of 2017. The soil had a pH of 7.5 which is neutral. The texture of the soil is black clayey. The land could be categorized under Class IV. The experiment was laid out in two plots. The treatments consisted of T₁ (Vibrated plot) and T₂ (control plot). The land was equally divided into two plots, each measuring 3 x 3 m. The material for this experiment comprised of four coconuts, kum-kum, vibrated water in an earthen pot and seeds (Palak) for the treated plot. A series of prayers followed by mantras were performed in a collectivity to vibrate the seed samples and water for the T₁ plot like Shri Ganesh Atharwashish and Shakhambhari Devi japas. Kum-kum was used to design swastik symbol on the coconuts. The vibrations were supplied to the T₁ plot through vibrated water and four coconuts which were buried inside the four corners of the field during land preparation. After the land

preparation, vibrated seeds were sown @ 10 Kg per ha in rows with a spacing of 30 x15 cm. The second plot, T₂ was kept as control to compare the performance of the T₁ with T₂. The performance of the T₁ and T₂ seeds were also examined under laboratory conditions to compare the results of germination% and vigor.

RESULTS AND DISCUSSION

Data on seed germination%, seedling vigor, growth components and herbage yield are presented in table-1.

Germination%: It was observed that out of 100 seeds 90 germinated in case of treated sample whereas only 65 in case of non-vibrated sample. The germination percentage was 65% for non- treated whereas for treated it is 90%. The germination percentage was increased by 25% with vibrated treatments.

Vigor: After a week, the treated seedlings (vibrated) showed better shoot and root length whereas the non treated seedlings were smaller. The color of the seedlings was green in case of treated whereas in case of non-treated it was pale in. The vibrated seedlings had a length of 11.0 cm whereas non-treated had a length of 7.0cm. The length of the root of vibrated seedlings was 1.5 cm whereas 0.5 cm in case of non-vibrated seedlings. There is an increase of 4cm in length and 1cm in root length.

This increase in germination% and vigor might be due to the stimulating power of electromagnetic vibrations by spiritual power.

Biometric observations: The leaves of the vibrated plants were green and broad whereas the leaf blade of non treated plants was narrow. The vibrated plants had 10 leaves in 40 days whereas non vibrated plants had 6-8 leaves. The length of the treated plant was 20.0 cm and that of non-treated was 14.0 cm. The leaf area for treated plants was 12,400 cm²/m² and that of non-treated was 9400 cm²/m². There is an increase in the length of vibrated plants compared to non -treated plants by 6cm. The vibrated leaf has an area of 12,400 cm²/m² whereas non treated leaf has an area of 9400 cm²/m². The leaf area has increased up to 31.9%

Yield : The yield of vibrated plot was 5 kg per 9 m² whereas for non treated plot it was 3.8 kg per 9 m². The herbage yield on an average was 5 t/ ha in case of vibrated plot whereas it was 3.5 t/ha in case of non vibrated plot. There was an increase in the herbage yield by 47.82%.

Table-1:Effect of Spiritual Farming Practices on growth and yield of Palak

Parameters	T ₁ (Vibrated)	T ₂ (Non vibrated)
Germination %	90%	65%
Vigor test	Green color seedlings,9.0cm	Pale green, 7.0cm length
Biometric observation (at 40 DAS)	10 Broad leaves, plant length 20.0 cm length	7 Small leaves, plant length 14.0 cm
Leaf area (cm ²)	12,400 cm ² /m ²	9400 cm ² /m ²
Herbage Yield (t/ha)	5.0 t/ha	3.5 t/ha

From the above results it can be concluded that there was an overall increase in productivity and total production in case of Sahaj Krishi by divine vibrations. Farmers do not need to spend much. Farmers are benefitted in two ways i.e. economic gain and spiritual balance and we can see our country becoming *Dhanya Bharat-Dhyana Bharat*.

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TIME MINIMIZATION USING TRAPEZOIDAL FUZZY NUMBERS

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Abstract:The fuzzy assignment problem, used in time minimization or maximization is actually a linear programming application. The optimization techniques are used to solve problems where we either minimize the total cost or maximize the total profit to improve the efficiency of the results. The main objective of the paper is to adopt a method to minimize fuzzy cost by using one's assignment algorithm and robust ranking technique on trapezoidal fuzzy numbers. A numerical example to check the feasibility of the method is discussed.

Keywords: Trapezoidal fuzzy number, Assignment problem, Ones assignment algorithm, Robust ranking technique.

1. Introduction

One of the earliest application of linear programming problem is the transportation problem, which is a way to minimize the total transportation cost inclusive of supply and demand restrictions. The basic transportation problem was developed by Hitchcock (1941). Later better methods were developed by Dantzig (1947) and then by Charnes et al. (1953). In real world, there are many diverse situations due to uncertainty in various parameters which can be due to measurement inaccuracy, lack of previous data, computational errors, lack of evidence and various other conditions. The study or the research is done in [1], [5].

To deal with the imprecise information in making decisions Zadeh [6] introduced the notion of fuzziness. Zimmerman [7] showed that solutions obtained by fuzzy linear program are always efficient.

The fuzzy set theory has been implemented in many areas of management and other fields. Since the aim is to minimize the total cost or maximize the total profit, subject to some fuzzy constraints, the objective function is also a fuzzy number. R Nagarajan and A Solairaju [2] presented an algorithm for solving fuzzy assignment problems using Robust ranking technique with fixed fuzzy numbers. Different methods were presented for assignment problem and lot of research has been carried out. [3], [4], [8].

In this paper, we proposed an algorithm for solving assignment problem where specified data is given in the form of trapezoidal fuzzy numbers. Finally we check the working of our method by a numerical example.

2. Preliminaries

2.1 Definition

A fuzzy set is characterized by a membership function mapping elements of a domain, space, or the universe of discourse X to the unit interval $[0, 1]$ (i.e.) $A = \{x, \mu_A(x); x \in X\}$. Here $\mu_A: X \rightarrow [0,1]$ is a mapping called the degree of membership function of the Fuzzy set A and $\mu_A(x)$ is called the membership value of $x \in X$ in the fuzzy set A . These membership grades are often represented by real numbers ranging from $[0, 1]$.

2.2 Definition

A fuzzy set A is convex if and only if, for any $x_1, x_2 \in X$, the membership function of A satisfies the inequality, $\{\lambda x_1 + (1 - \lambda)x_2\} \geq \min(\mu_A(x_1), \mu_A(x_2)), 0 \leq \lambda \leq 1$

2.3 Definition: Trapezoidal fuzzy number:

For a trapezoidal fuzzy number $A(x)$, it can be represented by $A(m, n, a, b; 1)$ with membership function $\mu(x)$ is given by

$$\mu(x) = \begin{cases} \frac{x - m}{n - m}, & m \leq x \leq n \\ 1, & n \leq x \leq a \\ \frac{b - x}{b - a}, & a \leq x \leq b \\ 0, & \text{otherwise} \end{cases}$$

2.4 Definition

The α -cut of a fuzzy number $A(\alpha)$ is defined as ,

$$A(\alpha) = \{x: \mu(x) \geq \alpha, \alpha \in [0,1]\}$$

2.5 Definition

Addition and Subtraction of two trapezoidal fuzzy numbers can be performed as
 $(a_1, b_1, c_1, d_1) + (a_2, b_2, c_2, d_2) = (a_1 + a_2, b_1 + b_2, c_1 + c_2, d_1 + d_2)$
 $(a_1, b_1, c_1, d_1) - (a_2, b_2, c_2, d_2) = (a_1 - a_2, b_1 - b_2, c_1 - c_2, d_1 - d_2)$

3. Robust Ranking Technique

Using Robust Ranking technique, fuzzy numbers can be converted into crisp ones. Robust ranking technique which satisfies compensation, linearity, and additive properties and provides results which are consistent with human intuition. Given a convex fuzzy number \tilde{a} , the Robust Ranking Index is defined by

$$R(\tilde{a}) = \int_0^1 (0.5)(a_\alpha^L, a_\alpha^U) d\alpha$$

Where (a_α^L, a_α^U) is the α - level cut of the fuzzy number \tilde{a} and

$$(a_\alpha^L, a_\alpha^U) = \{(n - m) \alpha + m, (a - (a - n) \alpha)\}.$$

The Robust ranking index $R(\tilde{a})$ gives the representative value of the fuzzy number \tilde{a} . It satisfies the linearity and additive property.

4. One’s Assignment Method - Algorithm

step 1. In a minimization case, find the minimum element of each row in the assignment matrix (say a_i) and write it on the right hand side of the matrix. Then divide each element of i^{th} row of the matrix by a_i . These operations create at least one ones in each rows. In term of ones for each row and column, do assignment, otherwise go to step 2.

step 2. Find the minimum element of each column in assignment matrix (say b_j), and write it below j^{th} column. Then divide each element of j^{th} column of the matrix by b_j . These operations create at least one ones in each columns. Make assignment in terms of ones. If no feasible assignment can be achieved from step (1) and (2) then go to step 3.

step 3. Draw the minimum number of lines to cover all the ones of the matrix. If the number of drawn lines less than n , then the complete assignment is not possible, while if the number of lines is exactly equal to n , then the complete assignment is obtained

step 4. If a complete assignment program is not possible in step 3, then select the smallest element (say d_{ij}) out of those which do not lie on any of the lines in the above matrix. Then divide by d_{ij} each element of the uncovered rows or columns, which d_{ij} lies on it. This operation create some new ones to this row or column. If still a complete optimal assignment is not achieved in this new matrix, then use step 4 and 3 iteratively. By repeating the same procedure the optimal assignment will be obtained.

5. Main Result:

To illustrate the proposed method, a fuzzy assignment problem is solved by using the above mentioned algorithms.

Problem: Let therows of the below matrix represent Persons, say X, Y, and Z and P and the columns represent four Jobs, say job1, job2, job3 and job4. Considering the past average records, the cost that each person takes to perform a job is known and represented by fuzzy trapezoidal numbers and the data is shown in below table.

Fuzzy costs (in rupees)				
person→ job↓	X	Y	Z	P
1	(4,6,7,10)	(9,10,11,15)	(5,8,10,11)	(5,8,11,12)
2	(6,8,10,12)	(4,7,8,10)	(7,8,10,11)	(5,8,9,10)
3	(3,5,6,7)	(4,6,7,10)	(5,7,10,11)	(8.11,13,15)
4	(5,7,10,11))	(2,5,6,7)	(6,8,10,12)	(2,4,5,7)

We will find the assignment of persons to jobs that will minimize the total fuzzy cost.

Solution: In conformation to model, the fuzzy assignment problem can be formulated in the following way,

$$\text{Min } \{ R(4,6,7,10) a_{11} + R(9,10,11,15) a_{12} + R(5,8,10,11) a_{13} + R(5,8,11,12) a_{14} + \\ R(6,8,10,12) a_{21} + R(4,7,8,10) a_{22} + R(7,8,10,11) a_{23} + R(5,8,9,10) a_{24} + \\ R(3,5,6,7) a_{31} + R(4,6,7,10) a_{32} + R(5,7,10,11) a_{33} + R(8,11,13,15) a_{34} + \\ R(5,7,10,11) a_{41} + R(2,5,6,7) a_{42} + R(6,8,10,12) a_{43} + R(2,4,5,7) a_{44} \}$$

Subject to

$$a_{11} + a_{12} + a_{13} + a_{14} = 1 \quad a_{11} + a_{21} + a_{31} + a_{41} = 1 \\ a_{21} + a_{22} + a_{23} + a_{24} = 1 \quad a_{12} + a_{22} + a_{32} + a_{42} = 1 \\ a_{31} + a_{32} + a_{33} + a_{34} = 1 \quad a_{13} + a_{23} + a_{33} + a_{43} = 1 \\ a_{41} + a_{42} + a_{43} + a_{44} = 1 \quad a_{14} + a_{24} + a_{34} + a_{44} = 1 \quad \text{where } a_{ij} \in [0,1]$$

By applying Robust Ranking technique, we calculate the value of $R(4,6,7,10)$.

The membership function of the trapezoidal fuzzy number (4,6,7,10) is

$$\mu(X) = \begin{cases} \frac{x - 4}{6 - 4}, & 4 \leq x \leq 6 \\ 1, & 6 \leq x \leq 7 \\ \frac{10 - x}{10 - 7}, & 7 \leq x \leq 10 \\ 0, & \text{otherwise} \end{cases}$$

The α -cut of the fuzzy number (4,6,7,10) is (a_α^L, a_α^U) where

$$a_\alpha^L = x - 4 / 2 = \alpha \Rightarrow x = 2\alpha + 4$$

$$a_\alpha^U = 10 - x / 3 = \alpha \Rightarrow x = 10 - 3\alpha$$

$$(a_\alpha^L, a_\alpha^U) = (2\alpha + 4, 10 - 3\alpha) = 2\alpha + 4 + 10 - 3\alpha = 14 - \alpha \text{ for which}$$

$$R(\tilde{a}_{11}) = R(4,6,7,10) = \int_0^1 (0.5)(a_\alpha^L, a_\alpha^U) d\alpha = \int_0^1 (0.5)(14 - \alpha) d\alpha$$

$$= \int_0^1 (7 - 0.5\alpha) d\alpha = 6.75$$

Similarly proceeding as above, the Robust's Ranking indices for the fuzzy costs are calculated and we get,

$$R(\tilde{a}_{11}) = 6.75, R(\tilde{a}_{12}) = 11.25, R(\tilde{a}_{13}) = 8.5, R(\tilde{a}_{14}) = 9.$$

$$R(\tilde{a}_{21}) = 9, R(\tilde{a}_{22}) = 7.25, R(\tilde{a}_{23}) = 9, R(\tilde{a}_{24}) = 8.$$

$$R(\tilde{a}_{31}) = 5.25, R(\tilde{a}_{32}) = 6.75, R(\tilde{a}_{33}) = 8.25, R(\tilde{a}_{34}) = 11.75.$$

$$R(\tilde{a}_{41}) = 8.25, R(\tilde{a}_{42}) = 5, R(\tilde{a}_{43}) = 9, R(\tilde{a}_{44}) = 4.5.$$

We now replace the values in their corresponding a_{ij} , which results in convenient assignment problem in the Linear programming problem.

$$\begin{bmatrix} 6.75 & 11.25 & 8.5 & 9 \\ 9 & 7.25 & 9 & 8 \\ 5.25 & 6.75 & 8.25 & 11.75 \\ 8.25 & 5 & 9 & 4.5 \end{bmatrix}$$

We now solve it by One's Assignment method . We use the steps mentioned in the algorithm to get the following optimal solution.

Step 1: We find the minimum element in each row, write it on the right of matrix and then divide each row with corresponding minimum element.

$$\begin{bmatrix} 6.75 & 11.25 & 8.5 & 9 \\ 9 & 7.25 & 9 & 8 \\ 5.25 & 6.75 & 8.25 & 11.75 \\ 8.25 & 5 & 9 & 4.5 \end{bmatrix} \begin{matrix} 6.75 \\ 7.25 \\ 5.25 \\ 4.5 \end{matrix} \quad \text{Min}$$

$$\begin{bmatrix} 1 & 1.67 & 1.26 & 1.33 \\ 1.24 & 1 & 1.24 & 1.1 \\ 1 & 1.29 & 1.57 & 2.24 \\ 1.83 & 1.1 & 2 & 1 \end{bmatrix}, \text{ as we see these operations create atleast one ones in each row.}$$

Step 2: Similarly now find minimum element in each column and write below respective columns and then divide each column with corresponding minimum element.

$$\begin{bmatrix} 1 & 1.67 & 1.26 & 1.33 \\ 1.24 & 1 & 1.24 & 1.1 \\ 1 & 1.29 & 1.57 & 2.24 \\ 1.83 & 1.1 & 2 & 1 \end{bmatrix}$$

$$\text{Min} \quad 1 \quad 1 \quad 1.24 \quad 1$$

$$\text{On dividing we get, } \begin{bmatrix} 1 & 1.67 & 1.02 & 1.33 \\ 1.24 & 1 & 1 & 1.1 \\ 1 & 1.29 & 1.27 & 2.24 \\ 1.83 & 1.1 & 1.61 & 1 \end{bmatrix}$$

Step 3: We now draw the minimum number of lines to cover all the ones of the matrix.

$$\begin{bmatrix} 1 & 1.67 & 1.02 & 1.33 \\ 1.24 & 1 & 1 & 1.1 \\ 1 & 1.29 & 1.27 & 2.24 \\ 1.83 & 1.1 & 1.61 & 1 \end{bmatrix}$$

Since the number of lines are less than n, the complete assignment is not possible. If the number of lines would had been equal to n, then complete assignment is obtained.

Step 4: we now select a smallest element a_{ij} which doesn't lie on any of the lines and then divide the uncovered row or column on which a_{ij} lies so that new ones are created to this row or column.

$$\begin{bmatrix} 1 & 1.64 & (1) & 1.30 \\ 1.24 & (1) & 1 & 1.1 \\ (1) & 1.29 & 1.27 & 2.24 \\ 1.83 & 1.1 & 1.61 & (1) \end{bmatrix}$$

Make assignment in terms of ones and the solution is (1,3), (2,2), (3,1) and (4,4)
i.e., assign $X \rightarrow \text{job3}$, $Y \rightarrow \text{job2}$, $Z \rightarrow \text{job1}$, $P \rightarrow \text{job4}$

The fuzzy optimal total cost is $\tilde{a}_{13} + \tilde{a}_{22} + \tilde{a}_{31} + \tilde{a}_{44}$
 $= R(5,8,10,11)a_{13} + R(4,7,8,10)a_{22} + R(3,5,6,7)a_{31} + R(2,4,5,7)a_{44}$
 $= R(14,24,29,35)$

Conclusion: In this paper we used a simple method to solve fuzzy assignment problem. This method can be used for all fuzzy assignment problems whether triangular or trapezoidal fuzzy numbers. It can also be used either to maximize or minimize the objective function.

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STUDIES ON PRODUCTION OF BIO-FILM AND BIOETHANOL PRODUCTION FROM BREADFRUIT FLOUR

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ABSTRACT

Development of bio-film and ethanol production with bread fruit flour. Breadfruit (*Artocarpus altitus*) is dehydrated and finely grinded to make flour which can be used in the preparation of bio- plastic and ethanol production. This flour alone was used to prepare all the products without any fortification. Ethanol is an important industrial chemical with emerging potential as a biofuel to replace fossil fuels. Breadfruit can be used as a source for bioethanol production and the source for optimization of the fermentation parameters. In the recent years, bio-based and biodegradable products have raised great interest since sustainable development policies tend to expand with the decreasing reserve of fossil fuel and the growing concern for the environment. This polymer bring a significant contribution to the sustainable development in view of the wider range of disposal options with minor environmental impact. The study focuses on value addition this underutilized crop which helps in income generation at village level.

INTRODUCTION

Breadfruit (*Artocarpus altitus*) is a member of Moraceae (fig) family (*artos* – bread *karpus* - fruit and *altitis* = fat). They are known to originate from Mexico. It is an important staple food in the Pacific region, parts of the Caribbean and other tropical regions. Fruits are rounded or ovoid 15 - 20 cm (6" - 8") long and 20 cm (8") in diameter. The skin is thin and green, becoming pale green with red brown areas on maturity. It is patterned with irregular polygon shaped "bumps" which flatten and enlarge on maturity of the fruit. In the centre of this seedless fruit, there is a cylindrical core. When mature, the interior of the fruit is white or pale and starchy. When completely green, the raw breadfruit is hard and starchy, like a raw potato; when fully ripe, it becomes sweet and tacky. It has slightly musky, fruity flavor, and is very bland. The respiratory climacteric of fruit harvested at the earliest maturity (13-to-15-week-old fruit) tended to be higher and later than that of fully mature (19-to-21-week-old) fruit. Breadfruit is vegetatively propagated using root shoots or root cuttings. Breadfruit grown from seed will fruit in 5 to 10 years.

Nutritional content in Breadfruit

Nutrient	Range	Average
Energy (kcal)	107-138	121
Protein (g)	0.6-1.3	1
Carbohydrate(g)	25-33	29
Fat (g)	0.1-0.2	0.2
Fiber (g)	2.1-7.4	5.2
Water (g)	65-73	69
Calcium (mg)	10-30	20
Iron (mg)	0.4-1.1	0.6
Magnesium(mg)	20-30	24
Phosphorus(mg)	18-41	32
Sodium (mg)	13-70	22
Zinc (mg)	0.07-0.13	0.1
Copper (mg)	0.04-0.15	0.1
Manganese(mg)	0.04-0.08	0.1
α carotene(μ g)	8-20	13
Vitamin C (mg)	2-12	4
Thiamin (mg)	0.09-0.15	0.1
Riboflavin (mg)	0.02-0.05	0.03
Niacin B3 (mg)	0.75-1.4	1



USES OF BREADFRUIT TREE :

Breadfruit is a multipurpose species and all parts of the tree are used. It is an essential component of home gardens and traditional agro-forestry systems, creating a lush over story that shelters a wide range of cultivated and native plants.

In the Pacific, breadfruit agro-forests have protected mountain slopes from erosion for more than two millennia. The trees have a beneficial impact on the natural environment creating organic mulch, shade, and a cooler micro-climate beneath the canopy. They give shelter and food to important pollinators and seed dispersers such as honeybees, birds, and fruit bats. A breadfruit tree yields food, construction materials, medicine, cordage, glue, insect repellent, and animal feed. The trunk may be as large as 2 meters in diameter and grow to a height of 4 meters before branching.

The wood is light and durable with a light golden color that darkens with age. It is used for the construction of houses and canoes because it resists termites and marine worms. The hulls of outrigger canoes are often fashioned from a single log and are still made in parts of Micronesia and Melanesia.

The wood is carved into attractive bowls, statues, handicrafts, furniture, and other items. Older trees are an important source of firewood, especially on the atoll islands. Sticky white latex is present in all parts of the tree and has been used for glue, caulk, and even chewing gum. Bees are attracted to and harvest droplets of latex from the surface of the fruit.

The inner bark, or bast, can be made into bark cloth or cordage. The leaves are used as fans, to wrap foods that are cooked in traditional earth ovens, and as biodegradable plates. Leaves, bark, and latex are all used medicinally.

MATERIALS AND METHODS:

VIII. PRODUCTION OF BIOPLASTIC(BIOFILM) FROM BREADFRUIT STARCH

Bio-plastics (Biofilm) are defined as “biodegradable plastics whose components are derived entirely or almost entirely from renewable raw materials.”

The materials used were vinegar (4.5% acidity) as the amylopectin-breaker, pure liquidpropan-1,2,3-triol (commonly known as glycerol or glycerin) as the plasticizer, breadfruit flesh as source of the starch, food coloring as color enhancer, distilled water, beakers as containers, graduated cylinder in measuring the accurate amount of liquid, grater to reduce the size of breadfruit, sinamay cloth as strainer, blending machine, triple-beam balance in measuring weights of samples, stopwatch in measuring the length of time intervals, stirring rods, spatula, iron stand, wire gauge, iron ring, alcohol lamp and a mini-oven toaster as drier. The research methodology included two parts, namely:

- The extraction of breadfruit starch
- The making of the bio plastic out of breadfruit starch.

EXTRACTING THE BREADFRUIT STARCH:

The method used in extracting the breadfruit was a simple similar process used in industries to extract starch. The same single method was utilized for all replications without alteration. Freshly fallen breadfruits that were mature enough (not ripe) were chosen for the purpose. Ripe breadfruits were found to hold less starch than unripe mature ones (Udio, et.al,2003) and breadfruits that were freshly harvested or not yet stored for 9days have more carbohydrate (starch) substance by 70.2% than 59.4% content after the ninth day of storage(Amusa, et.al, 2002).The breadfruit was then washed and peeled. Defected fleshes of the fruit were separated and discarded. A sufficient amount of the chosen flesh was grated and measured to reach 100g on a triple-beam balance as required for each replication. The measured flesh was then subjected to careful blending with 100-ml water in a blending machine just enough to barely reduce a little the size of its pieces. The mixture was then strained using a sinamay cloth.

MAKING OF BIOPLASTIC FROM BREADFRUIT STARCH:

Another 100-mL of water was added to the solid particles and was strained twice more. The filtrate was drained using a beaker and was left to settle completely for a maximum of three (3) hours. The water was decanted from the beaker leaving behind the white starch that settled in the bottom. The starch was washed by adding 100-mL distilled water, gently stirred and left to settle again for thirty (30) minutes. The water was decanted leaving the starch behind. The wet starch was poured on a transparent spot plate and left to completely dry under the sun. The time allotted for the complete drying process was dependent on the availability of sunlight. Completely drying the starch was necessary for the accuracy in measuring the mass needed in making the plastic.

MAKING THE PLASTIC:

25 mL of distilled water was poured into a 250-mL beaker. Two 2gm of breadfruit starch were added to the water and labeled as T1. 5mL of vinegar (4.5% acidity) was added to break down the branched amylopectin into a straight chain which was necessary to enable the starch to form a plastic film. About 2mL of propan-1,2,3-triol was also added to the treatment. The propan-1,2,3-triol (glycerol) would make the plastic become more softer and more flexible. Without or insufficient amount of it would make the plastic harder and stiffer but more brittle. The mixture was heated using an alcohol lamp and was constantly stirred. A pinch of food coloring was added into the treatment to enhance the color of the plastic. When the mixture started to thicken up, it was stirred even more. The mixture was carefully kept on boiling gently for 10-15 minutes until a clear and sticky substance was achieved in the sample.

IX. PRODUCTION OF ETHANOL BY FERMENTATIONAL COHOLIC FERMENTATION BY YEAST

AIM:

To study the alcoholic production by yeast fermentation .

PRINCIPLE:

Fermentation is a chemical process in which facultatively anaerobic microorganisms utilize a carbon source to produce an organic acid or carbon dioxide. Yeast are known to ferment sugar to produce alcohol to release carbon dioxide in the process. This ability of yeast is utilized in the preparation of alcoholic beverages and also in industrial production of ethanol from sugarcane molasses. The ability of a given strain of yeast to produce alcohol in the culture broth with the sugars as carbon sources can be demonstrated in the laboratory. For this process yeast *Saccharomyces Cerevisiae* is cultured in a basal medium with sugar in the presence of alcohol in the culture broth can be demonstrated both qualitatively and quantitatively.

REQUIREMENTS:

Yeast isolate (*Saccharomyces Cerevisiae*), yeast fermentation medium for alcohol, other common requirements.

PROCEDURE:

Prepare the yeast fermentation in a conical flask (100 ml in 250 ml flask) and sterilize. Inoculate the flask with actively growing culture of *Saccharomyces Cerevisiae*, under aseptic condition. Incubate the flask at 35°C for days or at room temperature (27± 2°C) for 10 to 14 days. After incubation, filter the contents of each flask separately using Whatman filter paper 1 and collect the filtrate. Alternatively the broth can be centrifuged and the supernatant collected for alcohol. Liquid broth is further processed for separation of ethanol by distillation.

DISCUSSION

The hexoses can be fermented to ethanol by yeast, whereas the pentoses can be fermented to ethanol, acetate, lactate, CO₂ and H₂ through the pentose-phosphate pathway with fructose-6-phosphate, glyceraldehyde-3-phosphate and pyruvate as intermediates.

Simultaneous saccharification and fermentation (SSF) has been studied to reduce the time and steps for bioprocessing to produce ethanol from starch and cellulosic biomass. In the SSF process, saccharification involves converting starch to glucose using enzymes and the glucose is catabolized to ethanol by a fermentative microorganism which occurs simultaneously.

As breadfruit is considered as a major source for ethanol production as it contains nearly 85% of starch. The experiment was conducted by making a slurry out of breadfruit flour which has been inoculated under laminar flow and autoclaved at 135psi for 30 minutes and the slurry was kept in an incubator shaker for 9 days for fermentation. Bioplastics can be made from cellulose, starch, oils, resins, and other plant- and animal-based materials.

Starches are important components of bioplastics. One example already in commercial production is starch-based packing foam, which replaces petroleum-based Styrofoam packing peanuts.

Starch has been extracted from pure breadfruit flour after sieving to avoid grits and to produce a smooth, opaque plastic material. The flour has been mixed with water and kept aside. The supernatant is separated and kept aside. At the bottom of the beaker there will be a fine white residue settled which is starch. The process is repeated for complete extraction of starch. Then the obtained starch is kept in a hot air oven to get a fine starch powder. This starch powder is used to prepare biofilms. In the first trial the starch while drying got charred and due to this the colour of starch changed to light brown colour. This starch when used for the preparation of biofilms, we obtain a brown colour plastic, which was not satisfactory.

CONCLUSION

Breadfruit is rich in starch, as now a days there is a huge demand for bio-degradable plastics, green plastics, bio-plastic made with breadfruit starch can easily fit in this context. As bio-plastics are environment friendly, the starch-based polymer can be made out of it.

The starch content of breadfruit flour can be broken down and fermented using microbes. Breadfruit itself is very nutritious and fermented foods out of it will fulfill all the required nutrients & all other requirements of the human body.

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AGRICULTURE IN INDIA USING CLOUD COMPUTING TECHNOLOGY

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Abstract

Cloud computing technology will change the view of Indian agriculture sector. In order to implement this technology government have to face a lot of problems. This paper will discuss major advantages of using cloud computing technology in agriculture sector and then discuss about how it will change the view of entire agriculture with the help of modern technology. This paper also focus on the great problem like unemployment and the implementation of the cloud computing will reduce the problem of unemployment. This paper will discuss about how the entire system will work. Finally the challenges faced in order to implement this system.

1. Introduction:

In India, More than 50 percentage of population are working in Agriculture sector. Agriculture plays a major role in Indian economy. It contribute in the agriculture based industry, employment, trading, food for huge population of the country and the most important in order to generate the employment.

In present time, almost each and every department are digitized and our Indian government also trying to implement and provide so many modern technologies to our Indian agriculture society. Our Indian government trying to setup the virtual market, providing Smartphone with high speed internet connectivity through which they can sort out their problems. But this is very limited way of thinking for half of the population.

So our agriculture field should change into the "Smart Agriculture." Smart agriculture will include Information and Communication Technology (ICT) in order to overcome with all the major drawbacks of our agriculture system. The major advantage of using the ICT technology infrastructure is to give the reliable solution in efficient manner. The tools and technology of ICT must be cheaper. Agriculture sector in India is huge, so the technology has to deal with the large amount of data. In order to deal with huge amount of data "Cloud Computing" is the best option. Cloud Computing having huge advantages as their software comes in less cost, it occupy very less space in terms of memory, allows user to access the data efficiently, gives a geographical view clearly and so many other which can help a lot in sector of the agriculture. The major problem of Indian agriculture system can be solved by the implementation of Cloud Computing.

2. Objective:

Indian agriculture are facing with the problem of the less area to grow crops, not having the proper knowledge of manures, fertilizers and biocides, the also suffer with problem of the proper irrigation as they are not aware with climate condition. They also suffer from the proper agricultural marketing. The main motive behind this paper is to resolve all major issue which will help to improve the current situation of the Indian agricultural.

The latest information will allow the farmers to deal with these changes smoothly. However, providing such crucial and timely knowledge is a challenge in itself owing to the highly localized nature of agriculture. The role of ICT technologies in agriculture has always been extremely crucial for owing to the highly unpredictable nature. The new application domain of ICT which can most widely be used for the progress of the agriculture sector is Cloud Computing. Cloud computing model will monitor and fulfil user requirements with a user-friendly and faster approach which includes services like demand-supply, communication, communication devices, e-knowledge sharing, conducting research and the other one e-Data, crop related, weather, soil information, growth progress monitoring farmers data, etc. Hence, if we need to improve the economic condition of these developing nations then the only way to do that is to improve the Indian agricultural sector. This upcoming technology is predicted to bring revolutionary changes to the agriculture sector by implementing the concept of Cloud Computing.

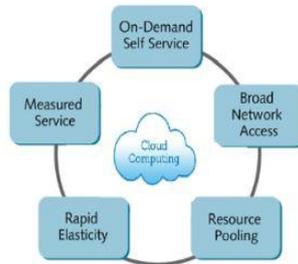
3. Overview on Cloud Computing:

Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. The charm of cloud computing is that the services may be availed whenever and wherever needed. It also reduces the cost of availing those services drastically. At the same time, it offers involvement of very less manpower and maintenance of those services. It also makes users free from certain concerns such as buying software, maintaining them up to date, maintenance of data etc. All these issues would be taken care of by Cloud providers.

Essential Characteristics:

- **On-demand self-service:** A consumer can unilaterally provision computing capabilities, such as server time and network storage, as needed automatically without requiring human interaction with each service provider.

- **Broad Network Access:** Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms (e.g., mobile phones, tablets, laptops, and workstations).
- **Resource pooling:** The provider’s computing resources are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand. There is a sense of location independence in that the customer generally has no control or knowledge over the exact location of the provided resources but may be able to specify location at a higher level of abstraction (e.g., country or state). Examples of resources include storage, processing, memory, and network bandwidth.



- **Rapid elasticity:** Capabilities can be elastically provisioned and released, in some cases automatically, to scale rapidly outward and inward commensurate with demand. To the consumer, the capabilities available for provisioning often appear to be unlimited and can be appropriated in any quantity at any time.
- **Measured Service:** Cloud systems automatically control and optimize resource use by leveraging a metering capability at some level of abstraction appropriate to the type of service (e.g., storage, processing, bandwidth, and active user accounts). Resource usage can be monitored, controlled, and reported, providing transparency for both the provider and consumer of the utilized service.

Service Models:

- **Software as a Service (SaaS):** In this model, a complete application is offered to the end user, as a service on demand. A single instance of the service runs on the cloud & multiple end users are serviced. Today SaaS is offered by companies such as Google, Salesforce, Microsoft, Zoho, etc.
- **Platform as a Service (PaaS):** The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages, libraries, services, and tools supported by the provider. The customer has the freedom to build his own applications, which run on the provider’s infrastructure.
- **Infrastructure as a Service (IaaS):** IaaS provides basic storage and computing capabilities as standardized services over the network. Servers, storage systems, networking equipment, data centre space etc. are pooled and made available to handle workloads. The customer would typically deploy his own software on the infrastructure. Some common examples are Amazon, GoGrid, etc. firewalls).

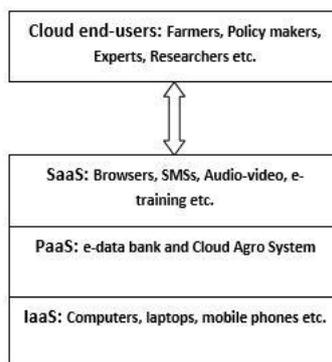


Fig: Cloud Computing Service Model

Historical overview of Cloud Computing:

Cloud computing involves the concept of ‘grid’, except that it provides on-demand resource provisioning. On the first milestone of cloud technology, Salesforce.com engraves its name in 1999. It pioneered the technique of delivering enterprise application via simple website. They provided both specialist & mainstream software firms to bring up application over internet.

The next development was in 2002 by Amazon's Web Service (AWS). They provided cloud-oriented services including storage, computing power & human intelligence via Amazon Mechanical Turk.

Then in 2006, Amazon launches their EC2 (Elastic Compute Cloud) – a Commercial Web services that let small organizations and sole proprietors to rent computers on which they run their computer applications. Initially most of the potential clients were not convinced to accept this shift. But gradually it has started picking up the market looking at its primary features viz. storage space, efficiency, easy accessibility, strong security, longevity, cheaper investment and maintenance, interoperability, ease of shifting base, quality support etc.

EC2/S3 became the 1st accessible cloud technology infrastructure service.

In 2009, another big milestone engraves the name of Google with Web 2.0. Google and others started to offer browser-base application via Google apps and other apps. Then Microsoft's Azure came – both Microsoft and Google deliver services in a way that is reliable and easy to consume.

Key features of Cloud Computing

- **Lower cost:** Being an online service, Cloud Computing provides access to applications using a browser while applications are stored on distributed servers.
- **Free access:** Access of applications from any location makes users independent.
- **More storage area:** As Cloud Computing is distributed process, it maintains a storage den. It provides more storage than personal storage.
- **Flexibility:** Cloud Computing provides a tension-free environment by upgrading, managing, installing software on its own. It provides a download free zone.
- **Mobility:** The user can connect to the Cloud from any location.
- **Ease of sharing:** This is key component of Cloud Computing. The information, resources and hardware sharing for instant delivery.
- **Data safety:** The files/data are safe unless the hard drive get stolen.
- **Availability:** There are several copies which can be owned as per user demand.
- **Synchronization:** Different experts from different issues, projects and locations.
- **Rapid elasticity:** migrating from one platform to another.

4. Application of Cloud Computing in Indian Agriculture:

The concept of cloud computing is implemented almost all the major field of the Global market, but still there is nothing much done in the agriculture field. All the major developed country like China, USA and Japan etc had implemented the concept of Cloud Computing in order to develop the sector of agriculture. But still there are so many developing countries including India are lacking behind in agriculture sector as these country are not using technology efficiently.

Implementation of ICT, Web applications and Smartphone applications can improve the major part the agriculture like Sales/planting planning, Operational planning, result management, patrolling support and cultivated land data management.

This major functioning will be based on the technologies sensors, networks and knowledge management. The condition of weather, soil and the global positioning system (GPS) is possible with the required sensors. The cloud computing technology has a powerful wireless access function. Users are able to get agricultural information through a variety of terminal not just the computer, which promotes the information sharing significantly.

The cloud computing should be efficient enough which will provide the crops information from the cloud platform and it should suggest automatically to corresponding improvement measures. For example, If any part of the field need some water and some part of the field need pesticides then cloud platforms must give the exact information with correct amount of water and the pesticides and also provide the information about how to apply that particular things.

Cloud computing technology also can be applied to the study of agricultural science. Particularly for some time consuming and high-cost experiments, or some experiments which are difficult to implement because of conditions limitations, the simulation can be great help to obtain the experimental results.

The system is able to optimize the investment in agricultural materials and improve material utilization, to achieve the purpose of reducing costs and increasing efficiency, and at the same time, it is able to effectively reduce the environmental pollution and realize sustainable agriculture development.

The system is able to optimize the investment in agricultural materials and improve material utilization, to achieve the purpose of reducing costs and increasing efficiency, and at the same time, it is able to effectively reduce the environmental pollution and realize sustainable agriculture development agricultural products supply chain, ameliorating agricultural products sales, and increasing farmers' profits.

Tracking and monitoring of agricultural products quality and safety can be fully realized in the cloud computing platform. The cloud computing technology has been integrated into the scientific research, raw materials access, production and processing, storage and transportation, marketing, quality traceability and information services, inspection and quarantine, supervision and administration, etc.

Improvement of Indian Agriculture:

As this paper is giving the brief idea how the implementation of the cloud computing will enhance the condition of Indian agriculture sector. Then majorly we can divide the entire cloud system for the project into two half where the first half will monitor and fulfil the requirement of the farmer and the end user in efficiently and very friendly nature and the other part of the cloud system have to store all the relevant and required data in the centralized location of the cloud.

First half of the Cloud System:

The first half of the system used to monitor the functionalities of the system and to retrieve the desired services. This system will provide information and facility to all the users and farmers, from any part of the country at any point of the time. The first half of the cloud services have to provide the major services like demand-supply, communication and knowledge sharing etc.

Demand-Supply will provide the up to date picture the demand of the country. It will help to take the proper decision in order to grow the crops. It will also provide the environment to analysis the fulfilment of demand and supply chain.

Communication and communication devices have to develop by keeping the literacy rate of the Indian society. The literacy rate of India is at little more than 74%. The calculation of the literacy depends on total percentage of the population of an area at a particular time aged seven years or above who can read and write with understanding. If we talk about only the farmers and the people who are working in the fields, they generally not aware with the technical term of the cloud computing and the ICT. So this half of the services have to provide the knowledge and the services in their own language as India having 22 different major languages. In present time, entire India using the Smartphone and peoples are very friendly with Internet and well connected with e-banks. Indian government already took so many major steps where they are trying to connect all the people to the bank and providing the apps like BHIM in order to stay connect with the bank. Similarly in the field of Agriculture, government have to take the major steps where, the system incorporates mobile services and helps the farmers in acquiring information of the fields, climate condition and etc from anywhere, at any time, through mobile phones.

This system also has to provide the facility of the knowledge sharing where the farmer will be connected with experts and consultant. They can attend the online program and the training with their regional language. This system also has to provide the practical knowledge by the experts on the ground/fields where the farmers will understand the things very clearly. This system will also provide the international knowledge and also get the relevant information from the expert who is not belonging from our country. So the system has to provide such kind of platform where the other language will be translated in their regional language for better performance.

It will also help the entire world's farmer to connect with each other and help to find the best way to find the best solution in the agriculture sector. All the information and the research work will be stored in cloud database for the future references.

Second half of the Cloud System:

The second half of the system of the storing all the related information and all the major decision which has to be taken or already took at the time of critical situation in the different situation in agriculture sector. This all the information must be store at the central of the cloud computing. This information will be retrieved by all the farmers at anytime from anywhere. The main motive behind it is to spread the information to the farmer in decision making. In order to this thing the cloud computing need database to store the data. The database can be of various types.

In agriculture fields we will store the information of the crop, weather and soil, growth of crops, farmer's data and the Expert/Consultant information. India is very big country and agriculture field have huge information as more than 50% people are involve in this. Cloud computing require different database to store all the major information in different databases for the better performance. So we will discuss on the major databases which we required in the field of agriculture.

Crop related information database will store the information related to crops grown in recent past years in different areas of the country. This is very important information in order to take decision in the present time. It will also help to overcome from the critical situations.

Weather information database will store the weather information of the specific region and also forecast the weather condition for the specific duration. This also helps the farmer to take the decisions for the selection of the crops in any particular weather.

Soil information database hold the nature of the soil of the different region and their behaviour for any particular crops. The nature and the type of soil differ from region to region. It will also plays the major role to take the decision by providing the trend of soil in past and will help in forecasting in the future.

Growth progress monitoring monitors and captures data on crop growth in different regions on a regular interval. This will be specifically useful in comparing the crop growth region wise and also comparing it with past data will bring a clearer picture.

Farmers Data holds the farmer information and study the role of local farmer in agriculture sector of different parts of the India. Designing agricultural policies will be easy if they are having the information of the farmers. This will also help in identifying the core agricultural areas, so that the policy makers can take decision on encouraging and promoting agriculture. This will also help in overcoming problems such as unemployment and rural urban migration.

Expert/Consultant provides solutions to common problems that farmers frequently experience. It will also give the information about the correct process of doing agriculture. It will also have a bundle of frequently asked questions (FAQs) and their answers to make the response reach the farmers faster.

5. Proposed Agriculture System Using Cloud Computing:

In India, the government have to take some serious decision on the field of agriculture. Increasing population and fulfil their need in terms of food will become a huge challenge in upcoming era, so our government have to take a serious action at every level of the system. Implementation of cloud computing in agriculture is not an easy task in India. Government have to make aware to the farmers with the new technology in agriculture by promoting, creating awareness program, by making them understand with the benefits of adopting the technologies, quality productising of the crops etc. All – level of government have to work together at for this upcoming problem. This paper is suggesting some system in order to achieve success of the implementation of cloud computing in Indian agriculture.

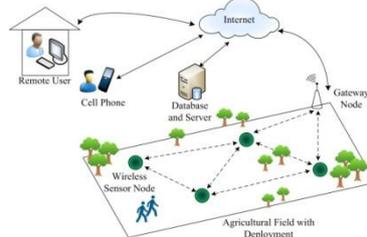


Fig: Overview of agriculture using Cloud computing

This proposed model will give great advantages to the agriculture sector in upcoming era. This system will be managed by the expert people who will work behind this day and night that ensure a better result. This system consist number of database which will ensure the expert and the farmers to retrieve and store data at anytime from anywhere. This system allows the farmer and the other user to communicate with the expert/consultant at anytime in order to find the solution. In other words, the communication channel will be stronger in this huge sector. This communication will be faster and easier and will be secured enough.

This proposed system will ensure the local people to work in their native place. The migration from one state to another or the migration from village to city will be reduced if they will get the job in village. It will also provide the huge number job to the less educated people.

The mentality of the farmer will changed if the will get good income and if they will get correct amount of money of their crops. Farmers will motivate their next generation to be in the field of agriculture as this motivation is lacking in present time in our country. Farmer can easily predict their value of the crops as they will know about the demand and supply of the market. This proposed system will ensure the fulfilment of the market and also tells about the stock of any particular crops. All particular data will be stored region wise/ state wise. Comparison will be accurate and basis of the data. This system will be a very big achievement if it implemented successfully country like India

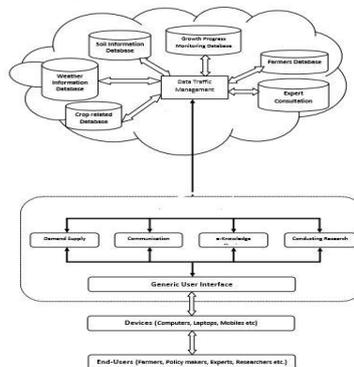


Fig: Agriculture System using Cloud computing

The agriculture sector will reach on the other level compare to the present situation which will also helps in the growth of the economic condition of our country. Due to this system, there will be a large number of business person will show interest as it will be beneficial for more than 50% of country's population.

Challenges in Implementation:

The main challenge of the implementation of cloud computing in agriculture is the investment. The farmer will not accept the cloud computing technologies very easily. Government have to work very hard as it will be one of the widest project of all the time.

Government have to separate one cloud service only for the agriculture sector. Security will be major concerns for this system.

As the large number of the people will be involved in this the internet bandwidth should be high with the lower price. In present time the average speed of the internet is 6.5Mbps. Indian cellular company have to work on this and they should provide at least 20Mbps for the better performance.

Initially government should take a trial and should deploy this system to some of the part of the country.

6. Conclusion:

The implementation of the cloud computing in any developing country will promote the economic growth as well as provide the large number of the job opportunity to the local farmers and the people. The implementation of this service will affect the entire country and the other corporate sector will also participate actively as it provides great services using cloud computing.

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STATISTICAL MODELLING FOR HEALTH INSURANCE DATA

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ABSTRACT

An emergent research view holds that financial markets are both uncertain and predictable. Also, markets can be efficient but also uncertain. Insurance companies typically face two major problems when they want to forecast future premium severity by using past or present behavior of premiums paid. For this, one has to find an appropriate Statistical Probability distribution for the large premiums paid. Then after test how well this statistical distribution fits the premiums data. This paper carries out a methodology for dealing with this problem. This work starts with introducing how actuarial modeling comes into practice for insurance premiums data. The variable used modeled is premium amounts from Insurance Regulatory Development Authority, Bombay, for the year 2010-11. The modeling process will ascertain a statistical distribution that could capably model the premium amounts, and then the goodness of fit test was done mathematically using graphically using the Probability-Probability Plots (P-P plots) and Q-Q plots. Finally, this study gives a summary, conclusion and recommendations that can be used by insurance companies to improve their results concerning future premium inferences.

Key words: Threshold, PP Plot, QQ plot, Probability Distribution, Total Premium Paid, Goodness of fitting.

Introduction:

Here, we collected secondary data from Insurance Regulatory Development Authority (IRDA),Health Data regarding their policies (June 2009-2010).We made certain assumptions on the data before use: (i) All premiums paid are independent (i.i.d) (ii) All the future premiums paid are predicted from the same distribution.

Before fitting any statistical distribution to the premium severity, the following steps were made in actuarial modeling process.

1. Selecting different families of distributions.
2. Estimating parameters for different distributions.
3. Verify the model fit.

Most of the data in Insurance is positively skewed (skewed to right)

Here, for the data we fitted different statistical distributions like Gamma, Pareto, Generalized Pareto, log Normal, Weibull etc. with the help of SPSS, descriptive analysis of the data, viz., all measures like mean, median, mode, skewness, kurtosis standard deviation, variance and also histogram was plotted for total premiums paid is shown in the graphical representation for the data. We tested that whether the data considered fits well with the assumed distributions well or not is considered.

DATA ANALYSIS:

In this section we consider to evaluate and fit the distribution to the data by considering the variable as Total premiums paid. Here the data consists of 50000 observations and 48 variables like age, gender, claims paid, premiums paid etc. we are interested in fitting a distribution for the variable of total premiums paid. As per the theory on distributions which provide good fit, but can be a bad fit at tails. The main interest in this situation is in the tails of the data (Denuit .Metal,(2007)). The insurer may not be interested in the maxima of observation but also in the behavior of the large observations which exceed a threshold. Hence, for the data on premiums we considered premium amounts which are greater than 100000. We started with summary statistics of the Total premiums paid. That is shown in table 1 below. These are the basic measures of the data. The data has much variation. The data indicated that mean > median implying positive right skewness with a high amount of kurtosis. We have estimated the gender wise difference by two sample Independent Z- test. The calculated test statistic value is, $Z=1.82233$ which is not significant. ($Z_{tab}=1.96$) indicating that there is no difference in the gender wise paying premium paid. This also premiums that the two samples have drawn from the same population.

Table-1
Summary Statistics:

<i>Mean</i>	738459.7015
<i>Standard Error</i>	123291.0717
<i>Median</i>	331424
<i>Mode</i>	1791552
<i>Standard Deviation</i>	1009180.915
<i>Sample Variance</i>	1.01845E+12
<i>Kurtosis</i>	7.012442806
<i>Skewness</i>	2.539538491

Range	5199598
Minimum	100402
Maximum	5300000
Sum	49476800
Count	67

Histogram:

Histogram is a graphical representation of the data. Histogram for total premiums paid shown in fig.1 and also,Histogram for total premiums paid for different distributions and also a normal curve superimposed on it (from Fig 2). This shows that skewness of the total premiums paid, it can be seen that the total premiums paid are heavy right tailed and there is a variation in total premiums paid.

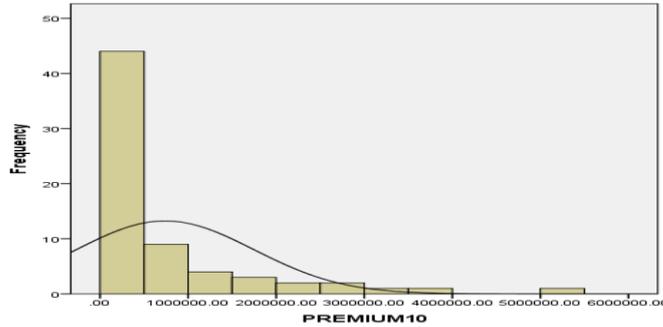
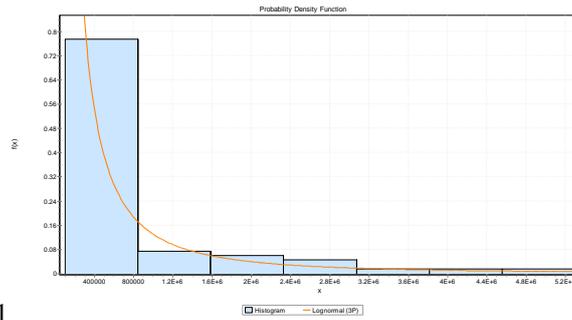


Fig.



1

Fig.2

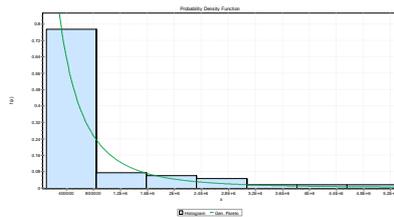


Fig.3

We also plotted the p-p plots and q-q plots for each and every distributions (from Fig 4 and Fig 5).Before We set up the hypothesis that premiums paid follows all these distributions,by formulating the objective of Log Normal Distribution is the best fit for the premiums paid data.(vs.) Log Normal Distribution does not fit for the premiums paid data.

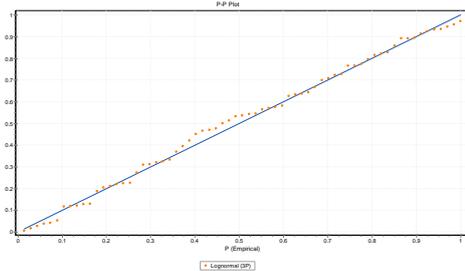


Fig.4

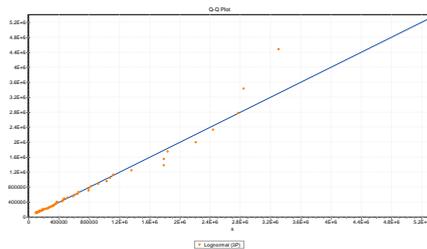


Fig.5

From figure 4 and Fig.5, we observe that the circles all lie quite close to the line; close enough to say that the data come from a Log Normal distribution. There's a little random wriggle about the line, this does not disqualify these data from being Log Normal Distribution close enough is good enough therefore, we accept the hypothesis that Log Normal fits well for premiums paid data.

Similarly, we set up the hypothesis that premiums paid follows all these distributions, by formulating the objective of Gamma distribution is the best fit for the premiums paid data. (vs) Gamma distribution does not fit for the premiums paid data. And also for other distributions.

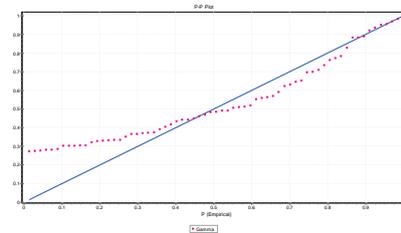


Fig.6

Before fitting different distributions, we estimated the parameters of the distribution, generally there are three methods for estimating the parameters.

1. Maximum Likelihood Estimation
2. Method of moments
3. Probability weighted methods

The parameter estimation of all the distributions was obtained with the help of SPSS software and those are given in table 2

Sno	Distribution	Parameters
1	Beta	$\alpha_1=0.27357$ $\alpha_2=1.6298$ $a=1.0040E+5$ $b=5.3000E+6$
2	Exponential	$\lambda =1.3542E-6$
3	Exponential (2P)	$\lambda =1.5673E-6$ $\lambda =1.0040E+5$
4	Fatigue Life	$\lambda =1.17$ $\lambda =4.5172E+5$
5	Gamma	$\lambda =0.53545$ $\lambda =1.3791E+6$
6	Gamma (3P)	$\lambda =0.61495$ $\lambda =1.0030E+6$ $\lambda =1.0040E+5$
7	Gen. Extreme Value	$k=0.5286$ $\lambda =2.7981E+5$ $\lambda =2.7331E+5$
8	Gen. Gamma	$k=1.1485$ $\lambda =0.63094$ $\lambda =1.3791E+6$
9	Gen. Pareto	$k=0.43318$ $\lambda =39084E+5$ $\lambda =48925.0$
10	Log-Gamma	$\lambda =148.99$ $\lambda =0.08651$
11	Lognormal	$\lambda =1.0481$ $\lambda =12.889$
12	Lognormal (3P)	$\lambda =1.7317$ $\lambda =12.205$ $\lambda =98210.0$
13	Normal	$\lambda =1.0092E+6$ $\lambda =7.3846E+5$
14	Pareto	$\lambda =0.72857$ $\lambda =1.0040E+5$
15	Pareto 2	$\lambda =-2.9085$ $\lambda =1.4390E+6$
16	Weibull	$\lambda =10657$ $\lambda =6.4038E+5$

Table 2

Goodness of Fit – Summary

After treating the data fitting with various distributions, we now test these with KS-test, Anderson Darling and Chi-squared test and found that, the Log Normal Distribution(3P) fits well with all the three tests for the premium data which is listed

under Table 3, Serial Number 12 in the table below which ranks “1” under the three tests. Therefore, one can conclude that, Premiums paid follows Log Normal Distribution with authenticity Log Gamma Distribution falls under second and so on. We can conclude that Total premiums paid follows LogNormal Distribution and we can estimate the number of persons can pay certain premium and above any premium paid by using the above Log Normal Distribution. This study can further be studied for various data sets on actuaries which will be helpful to process the premium and other parameters of the data. Thus, we can explore this procedure of fitting and estimating the parameters for other than premiums data for different set of variables such as claims premium paid, etc.

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REACTION OF SORGHUM GENOTYPES AGAINST STEM BORER(*CHILLO PARTELLUS*)

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ABSTRACT

A field experiment was conducted at the Department of Entomology, College of Agriculture, Rajmata Vijayaraje Scindia Krishi Viswa Vidyalaya, Gwalior, (M.P) during Kharif season 2016, to study the least susceptible variety of sorghum genotypes (*Sorghum bicolor*) against stem borer (*Chillo partellus*). The genotypes under test were evaluated for the incidence of stem borer (*Chillo partellus*) on the basis of leaf injury and dead heart caused by borer in the stem. The test sorghum genotypes differed significantly with respect to per cent leaf injury caused by stem borer at 30 and 45 days after emergence (DAE). The minimum per cent leaf injury was recorded at 30 DAE in genotype SPV-2327(12.09%) and the maximum leaf injury per cent was recorded in ICSSH 82(36.5%). Similarly, at 45 DAE, the per cent leaf injury caused by stem borer in test genotypes differed significantly. The minimum leaf injury was recorded in genotype SPV2327 (22.44%) and the maximum per cent of leaf injury caused by stem borer was recorded in genotype ICSSH 82(38.8%). The data recorded on the dead heart caused by stem borer in different genotypes under test revealed that minimum dead heart per cent at 30 DAE was observed in the genotype SPV 2328 (14.33%) and the maximum dead heart per cent was recorded in genotype ICSSH82 (40.41%). Similarly, at 45 DAE, the per cent dead heart symptoms differed significantly. The minimum dead heart symptoms were observed in the genotype SPV 2328(20.5%) and the maximum dead heart percent was recorded in ICSSH-82 (46.3%).

Keywords: *Sorghum Genotypes, Stem borer, Per cent leaf injury, Dead heart.*

INTRODUCTION

Sorghum (*Sorghum bicolor L.*) is one of the most important cereal crops in Africa, Asia, USA, Australia and Latin America. In India, sorghum is planted in an area of 7.79 million ha with an annual production of 6.45 million tonnes (FAO, 2016). Under subsistence farming conditions, the productivity levels are quite low (500–800kg/ha), primarily due to biotic and abiotic constraints. Over 150 species of insects infest the sorghum crop at different stages of growth in the semi-arid tropics and cause an estimated loss of 1 billion US\$ annually (ICRISAT, 2013). Among these, sorghum shoot fly *Atherignasoccata*(Rondani), spotted stem borer *Chilopartellus* (Swinhoe), sorghum midge *Stenodiplosisorghicola* (Coquillett), head bugs *Calocorisangustus*(Lethiery) and *Eurystylusoldi* (Poppius), sugarcane aphid *Melanaphis sacchari* (Zehntner), shoot bug (*Peregrinusmaidis* (Ashmead) and the oriental armyworm *Mythimnaseparata* (Walker) are the most important pests. Agronomic practices, natural enemies, synthetic insecticides and host plant resistance have been employed for minimizing the losses due to insect pests in sorghum. However, farmers cannot plant at times when pest damage can be avoided as planting times are dictated by the onset of rainfall, while insecticide application is beyond the reach of resource-poor farmers in the semi-arid tropics (Sharma, 1985). Host plant resistance can play a major role in minimizing the extent of losses in this crop (Sharma, 1993) and is compatible with other tactics of pest management, including the use of natural enemies and chemical control. Importantly, deployment of insect-resistant cultivars in integrated pest management would also lead to a drastic reduction in pesticide residues in food and food products, and reduce environmental pollution. Considerable progress has been made in screening and breeding for resistance to sorghum shoot fly, spotted stem borer, head bugs, midge and sugarcane aphid (Sharma, 1993), and a number of genotypes with different levels of resistance to these pests have been identified. However, the levels of resistance to some insect species are low to moderate (Sharma et al., 2003). In general, two or more insect species attain damaging proportions on the same crop in a crop-growing season. Therefore, cultivars with multiple resistance to the major pests that damage the crop during the various stages of crop growth in a region would be the most desirable. In the present study, testing of different genotypes was done to check the resistance against sorghum stem borer.

MATERIALS AND METHODS

A field experiment was conducted at the Department of Entomology, College of agriculture, R.V.S. Krishi Vishwa Vidyalaya, Gwalior (M.P) during Kharif season 2016. The experiment was carried out in a randomized block design (RBD) with 20 treatments and three replications. The 20 sorghum genotypes were obtained from the ICRISAT (Patancheru, Hyderabad). Sorghum genotypes were taken and they are planted in 5m length of two rows each with a spacing of 45 cm between the rows and 12 cm between the plants. A recommended dose of 80 kg N, 40 kg P and 40 kg k were applied and the other agronomic practices were followed. The observations to know the percent leaf injury and dead heart caused by stem borer was recorded at 30 and 45 days after emergence. A total number of plants showing leaf injury and dead heart symptoms were recorded in each genotype replication wise and subjected to statistical analysis. The significance of the difference between the treatment means was tested by the Critical Differences (CD) test at 5% level of probability. The experimental data were statistically analyzed with the methods described by Panse and Sukhatme, 1978.

RESULTS AND DISCUSSION

The results revealed that there was a significant difference for susceptibility in sorghum genotypes on the basis of percent leaf injury and percent dead hearts caused by stem borer (table-1). Per cent, leaf injury recorded at 30 DAE showed the significant difference. The leaf injury ranged from 12.09 to 29.03%.The lowest leaf injury % was recorded in genotype SPV2327(12.09) followed by SPV2326(16.13) and ICSSH88(16.3). Similarly, at 45 DAE, the leaf injury was ranged from 22.44 to 38.8 %, the lowest leaf injury was recorded in genotype SPV2327(22.44) followed by DHBM3(22.81),ICSSH88(22.96). The present findings were also in accordance with the findings reported by Sarailooet al., (1986),Bhadviyaet al., (1995),Vyas et al., (2014).

Table:1 Per cent leaf injury caused by stem borer in different genotypes of Sorghum.

S.no	Genotypes	Per cent leaf injury at 30 DAE	Per cent leaf injury at 45 DAE
1	ICSV 25335	20.87(27.18)*	32.53(34.77)*
2	ICSSH 87	29.23(32.73)	32.63(34.83)
3	ICSSH 86	24.4(29.60)	30.53(33.54)
4	ICSV 25306	27.2(31.43)	31.73(34.28)
5	ICSSH 82	36.5(37.17)	38.8(38.53)
6	ICSSN 79	23.53(29.01)	23.83(29.22)
7	ICSSH 88	16.3(23.80)	22.96(28.62)
8	DHBM 5	17.7(24.87)	24.76(29.83)
9	DHBM 4	29.03(32.60)	32.63(34.83)
10	DHBM 2	25.61(30.40)	34.88(36.20)
11	ICSV 25308	16.6(24.03)	23.26(28.83)
12	ICSV 25333	18.63(25.56)	29.23(32.73)
13	ICSV 15006	20.05(26.60)	31.51(34.15)
14	SPV 2326	16.13(23.67)	28.43(32.22)
15	SPV 2327	12.09(20.34)	22.44(28.27)
16	SPV 2328	17.7(24.87)	23.06(28.70)
17	DHBM 1	23.58(29.05)	29.71(33.03)
18	DHBM 3	22.51(28.32)	22.81(28.52)
19	SSV 84	20.07(26.61)	31.53(34.16)
20	CSH 22 SS	20.33(26.80)	33.03(35.08)
	SEm±	(0.20)	(0.21)
	CD	(0.57)	(0.61)

A significant difference was observed between the dead hearts produced by sorghum stem borer at 30 and 45 DAE. At 30 DAE, the per cent dead hearts ranged from 14.33 to 40.41. The lowest number of dead hearts were recorded in genotype SPV2328 (14.33) followed by DHBM3(19.7),ICSV 25335(21.07). Similarly, at 45 DAE, the dead heart percentage ranged from 20.5 to 46.13. The minimum number of dead hearts was recorded in genotype SPV2328(20.5) followed by DHBM3(24.13) and DHBM 4(26.1). Similar results were reported by Kishore et al. (2002),Vyaset al. (2014), Teliet al. (1983) who screened different genotypes of the sorghum against stem borer.

Table:2 Per cent dead hearts caused by stem borer in different genotypes of Sorghum.

S.no	Genotypes	Per cent dead heart at 30DAE	Per cent dead heart at 45DAE
1	ICSV 25335	21.07(27.32)*	35.5(36.57)*
2	ICSSH 87	21.5(27.62)	35.16(36.37)
3	ICSSH 86	28.57(32.31)	34.81(36.15)
4	ICSV 25306	24.08(29.38)	36.24(37.01)
5	ICSSH 82	40.41(39.47)	46.13(42.78)
6	ICSSN 79	39.65(39.03)	45.09(42.18)
7	ICSSH 88	30.93(33.79)	40.26(39.38)
8	DHBM 5	34.13(35.75)	38.4(38.29)
9	DHBM 4	24.76(29.84)	26.1(30.72)
10	DHBM 2	30.43(33.48)	43.06(41.01)
11	ICSV 25308	27.23(31.45)	33.5(35.36)
12	ICSV 25333	27.7(31.75)	31.07(33.87)
13	ICSV 15006	30.24(33.36)	31.88(34.37)
14	SPV 2326	22.53(28.33)	39.3(38.82)
15	SPV 2327	26.06(30.69)	31.3(34.02)
16	SPV 2328	14.33(22.23)	20.5(26.92)
17	DHBM 1	33.63(35.44)	38.3(38.23)
18	DHBM 3	19.7(26.34)	24.13(29.42)
19	SSV 84	24.51(29.67)	32.48(34.74)
20	CSH 22 SS	24.7(29.80)	27.93(31.90)
	SEm±	(0.20)	(0.16)
	CD	(0.59)	(0.45)

Conclusion:

From the above experiment, it can be concluded that Genotype SPV2327 showed the least susceptibility to percent leaf injury caused by stem borer followed by SPV2326 and DHBM3.

Genotypes SPV2328 showed the least susceptibility to dead hearts caused by stem borer followed by DHBM3 and ICSV25335.

Genotypes found less susceptible in the present studies may be screened with some newly developed genotypes, to find out the source of resistance against major pests of sorghum.

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LOCKING WORLD HUNGER AND UNLOCKING NUTRITIONAL SECURITY

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INTRODUCTION

Hunger and Malnutrition are widespread and stubborn development challenges around world. The planet creates more than enough food but still 925 million hungry people in world & nearly 180 million preschool-age children do not get vital nutrients. 161 million children under age 5 are too short for their age (stunted), 51 million don't weigh enough for their height (wasted), and 42 million are overweight; none of these children are growing healthily (UNICEF/WHO/World Bank 2015). One in every nine people on Earth -795 million in all is still goes to sleep hungry. Almost all the hungry people, 780 million, lives in developing countries. There are 11 million people in developed countries. A sizable of 30 percent of these people live in India, hence thinking about food security necessarily involves thinking about India. In 2009-11, India has 190 million undernourished people (FAO, IFAD and WFP 2014). One of the three people in world suffer from hidden hunger which is caused by lack of Vitamin-A, zinc and iron in the diet. Forty-five percent of all mortality of children under age 5 is linked to malnutrition (Black et al. 2013). Deficiencies of vitamins and minerals have important health consequences, both through their direct effects, such as iron deficiency anemia, xerophthalmia due to vitamin A deficiency, and iodine deficiency disorders, and because they increase the risk of serious infectious diseases. In the latter category, vitamin A and zinc deficiencies have been shown to have the greatest effects among the micronutrients.

In developed world, mostly food is wasted by the consumers. It makes sense that more than half of the world's losses in kitchen (because they can afford). World's hungry poor waste little, because they cannot afford it. In Africa, average daily food waste is 500 calories per annum in those consumers' accounts only 5% and remaining occurs at insufficient agriculture, pest, and diseases during storage. In India an average about 21 percent of the total amount of food is lost i.e. one kg in every 5 kg production (approx), most of the losses takes place in food supply chain, followed by on farm losses such as harvesting, winnowing, threshing etc., consumer losses is very low about 4 percent when compared to developed world. Around world one fourth of all food is lost each year owing to insufficient harvesting; improper storage and transportation wastage in kitchen i.e. farm to plate. By halving the waste, we could feed extra billion people. 2 billion people experience micronutrient malnutrition (IFPRI, 2015).

MATERIALS AND METHODS

The production is now met the needed amount, but many people are still not getting food, because of poverty in many countries and loss of food i.e. post harvest loss. Food is wasted throughout the food supply chain. In medium and high-income countries high extent of food is wasted i.e. thrown away even if still suitable for human consumption. In low income countries food is lost during production to processing stages. Site specific strategies need to be adopted. Rural food system countries must focus on improving agricultural productivity and food security. The remedies to reduce the waste include curing the Roots and Tubers to minimize damage and richer world need to adopt expensive refrigeration.

The most effective intervention is to alleviate malnutrition around world providing varied diet includes fresh fruits, vegetables, fishes, meat etc., But this is impractical in many countries because of socio-economic impacts and not available in some regions. Breastfeeding promotion during 6 months of life as does UNICEF. In developing world where infrastructure is good, micronutrient nutrition can be addressed by supplements (tablets or sachets form) or conventional fortification; but great infrastructure is needed. But sadly these strategies are unsuccessful in most of the nations due to lack of funding, poor governance, taboos. Limited number of methods only got successful includes iodized salt, iron & folate fortification of wheat flour. Copenhagen consensus ranked different strategies to alleviate micro nutrient malnutrition according to their cost effectiveness.

Copenhagen Consensus Center Strategies The Copenhagen Consensus Center is a think-tank based in Denmark that advises governments and organizations about to address the world's greatest challenges (Table 1)

Table 1

Rank	Solution	World's challenge
1	Micronutrient supplements for children (vitamin A and zinc)	Malnutrition
2	The Doha development agenda	Trade
3	Micronutrient fortification (iron and salt iodization)	Malnutrition
4	Expanded immunization coverage for children	Diseases
5	Biofortification	Malnutrition
6	Deworming and other nutrition programs at school	Malnutrition and Education
7	Lowering the price of schooling	Education
8	Increase and improve girls' schooling	Gender equality
9	Community-based nutrition promotion	Malnutrition
10	Provide support for women's reproductive role	Gender equality

FORTIFICATION OF FOOD WITH MICRONUTRIENTS

Food fortification is most economical long term strategies for micronutrient nutrition. Fortification of food materials done while processing or at end, this makes the final product costs more and makes unaffordable to most poor people living in the rural areas and also in cities. Fortification requires government support for implementation and monitoring. Extensive research should be needed to find out the best vehicles to deliver micronutrients and also suitable agent should be selected-that should be stable and should mobilize easily in gut without affecting the quantity and taste of food. Many parts of world suffer from multi-nutrient deficiencies. So, strategies must develop to fortify the foods with multiple nutrients which are increasing for particular region and it should be needed specific.

Iodization of edible salt is one of the nutrition success story in twentieth century by helping to eliminate Iodine Deficiency Disorder (IDD) in many parts of the world (including developed and developing world). In 1994, WHO & UNICEF recommended mandatory salt iodization in all countries to ensure consumption and prevention of non-iodized salt. Now around 80% of households in developing world consuming iodized salt, Even though some of the nations are still not accessing to iodize salt due to lack of funds and government support and policies.

Other examples of fortification of food includes iron and folate fortification of wheat flour; selenium-fortified products such as cereals, soft drinks, salt; multinutrient fortification of biscuits with iron, zinc, vitamin A to vitaminise school-children for deworming.

BIOFORTIFICATION

Biofortification is a long-term strategy to improve nutrition. Biofortification focus on increasing the nutrition quality of crops at source, more bioavailability of micronutrients in the edible parts of the crops. These can be achieved by plant breeding and Genetic engineering tools. The Harvestplus programme was launched by the Consultative Group of International Agriculture Research (CGIAR) leads a global effort for nutritional improvement in staple food crops by breeding tools with the alliance of International Rice Research Institute (IRRI), the Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT), the Centro Internacional de Agricultura Tropical (CIAT) and other institutions around globe to breed higher amounts of vitamins and minerals directly into staple foods. These include bean, cassava, orange, sweet potato, rice, maize, pearl millet and wheat.

An example of biofortification projects includes

- Iron-biofortification of rice, beans, cassava, sweet potato and legumes
- Zinc fortification of wheat, rice, beans, sweet potato and maize
- Provitamin A carotenoid-biofortification of sweet potato, maize and cassava
- Amino acid and Protein-biofortification of sorghum and cassava

Breeding for increased mineral levels is more sustainable than conventional interventions like fortification but it needs long developmental times and extensive research. Now-a-days Breeders utilize Biotechnological tools such as Quantitative Trait Locus (QTL) maps and Marker Assisted Selection (MAS) breeding to speed up the identification of nutrition traits on particular loci for introgression into new varieties. Many staple food crops are needed to be improved by introgression of nutritive genes from the wild relatives. Iron and zinc levels vary in many crops. The amount of iron in rice grains varies between 6-22 mg kg⁻¹, whereas in wheat 15-360 mg kg⁻¹ and in maize 10-160 mg kg⁻¹. Zinc levels are 14-61 mg kg⁻¹ in rice, 14-190 mg kg⁻¹ in wheat, and 12-96 mg kg⁻¹ in maize. These strategies are achieved fastly by utilizing the Genetic engineering tools to stack up all essential vitamins and minerals in some plant without highly complex breeding programmes.

CONCLUSION

Nutrition has insightful effects on health throughout the human life and is inseparably linked with intellectual and social development, especially in early childhood. To address some of the major elements of food insecurity includes policy liberalization and allowing private sector for production and processing the food (including fortification). Fortified food

should supply through public distribution system the people who actually needed. Need paradigm-shift from Conventional breeding tools to Molecular tools like Genetic engineering, transgenic methods etc., to release new variety of crops have high nutritive value. Mainly Rice is staple food for billions of people around world and in India around 70 percent of people consume rice once in a day at least. So, need to increase research on biofortification of rice to increase iron, zinc, provitamin-A also in other crops. Governments should build up, implement, and monitor plans and policies for making their food systems nutrition friendly. Governments, consequently need a careful and complete process for assigning high-impact policy options to make their food systems nutrition friendly.

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CLOUD COMPUTING SERVICES AND APPLICATIONS BASEDON INTERNET OF THINGS (IOT)

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Abstract :-Can you imagine this being possible without cloud? Cloud Computing provides us by means which we can access the applications us utilities over the internet. It allows us to create and customize, configure the business applications online.

Index terms :-Cloud Computing, Customize, Configure.

Audience:-This reference has been prepared for the beginners to help them understand the basic advanced concepts related to cloud computing. It will help

1. INTRODUCTION

The term "**cloud**"[1]refers to a network or internet. In other words we can say that cloud is something which is present at remote location. Cloud can provide services over network ie., public networks or private networks ie WAN, LAN or VPN. Applications such as E-mail, web conferencing, Customer relationship management (CRM) all run in cloud.

Cloud computing refers to manipulating, configuring and accessing applications online. It offers online data storage, infrastructure and application.We need not to install a piece of software on our local PC, this is how cloud computing overcomes platform dependency issues. Hence, the cloud computing is making our business application mobile and collaborative.

Basic concepts :There are certain services and models working behind the scene & making the cloud feasible and accessible to end users.

Deployment models :It defines the type of access to the cloud. How the cloud is located? Cloud can have any of the four types of access[3], public, private, hybrid & community.

a. Public cloud :This cloud allows systems & services to be easily accessible to the general public. It is less secure because of its openness.

Eg: G-mail.

b. Private cloud: It allows systems & services to be accessible within an organization. It offers increased security because of its private nature.

c. Community cloud: The cloud allows system & services to be accessible by a group of organization's.

d. Hybrid cloud:It is mixture of public & private cloud. The critical activities are performed using private cloud while non critical activities are perfumed using public cloud[2].

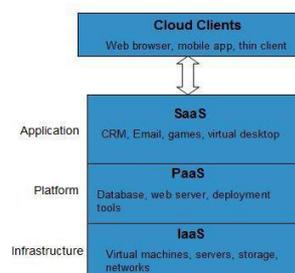
Service models :Service models are the reference models on which the cloud computing is based. These can be categorized into 3 basic service models are listed below.

Infrastructure as a service (IaaS)

Platform as a service (Paas)

Software as a service (SaaS)

Infrastructure as a service (IaaS) :It is the most basic level of science. Each of the service models make use of underlying service model ie., each inherits the security and management from the underlying models.



It provides access to fundamental resources such as physical machines, virtual machines, virtual storage etc.

2. Paas :It provides the runtime environment for applications, development & development tools etc.

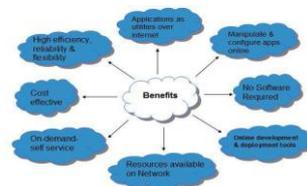
3. SaaS :This model allows to use software applications as a service to end users.

2. HISTORY

The concept of cloud computing came into existence in 1950 with implementation of mainframe computers, accessible via thin/static clients. Since then cloud computing has been evolved from static clients to dynamic ones from software to services .

➤ Benefits

1. One can[4] access applications as utilities over the internet.
2. Manipulte & configure the application online at any time.
3. It does not require to install a specific piece of software to access or manipulate cloud application.
4. Cloud computing offers online development & deployment tools, programming runtime environment through platform as a service model .
5. Cloud resources are available over the network in a manner that provides platform independent access to any type of clients.
6. Cloud computingoffers on - demand - self - service. The resources can be used without interaction with cloud service provider.
7. Cloud computing is highly cost effectivebecause it operates at higher efficiencies with greater utilization.
8. It offers load balancing that makes it more reliable.



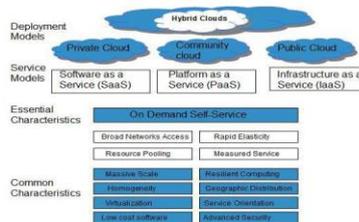
➤ Risks

Although cloud computing is a great innovation in the world of computing, there also exists [downsides] of cloud computing.

➤ Security & Privacy

It is the biggest concern about cloud computing. Since data management infrastructure management in cloud is provided by third party it is always a risk to handover the sensitive information to such provider.

Although the cloud computing vendors ensure some secure password protected accounts any type of security breach would result in loss of clients & business. There are four key characteristics of cloud computing. They are shown in the following diagram.



3. CLOUD COMPUTING ARCHITECTURE

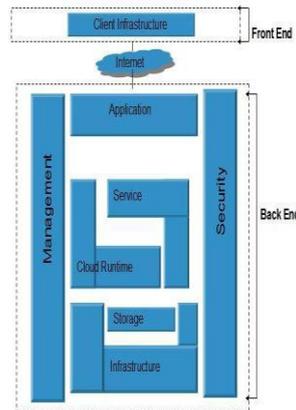
It comprises of many cloud components, each of them are loosely coupled. We can broadly divide the cloud architecture into two parts.

1. Front end
2. Back end

Each of the ends are connected through a network, usually via internet. The following diagram shows the graphical view of cloud computing.

1. Front End : refers to the client part of cloud computing system. It consists of interfaces and applications that are required to access the cloud computing platforms, e.g., Web Browser.
- 2.Back End refers to the cloud itself. It consists of all the resources required to provide cloud computing services. It comprises of huge data storage, virtual machines, security mechanism, services, deployment models, servers, etc.

- It is the responsibility of the back end to provide built-in security mechanism, traffic control and protocols.
- The server employscertain protocols, known as middleware, helps the connected devices to communicate with each other.



Cloud Infrastructure Components

Cloud[5] infrastructure consists of servers, storage, network, management software, and deployment software and platform virtualization.

Hypervisor :

Hypervisor is a firmware or low-level program that acts as a Virtual Machine. Manager. It allows to share the single physical instance of cloud resources between several tenants.

Management Software

Management Software helps to maintain and configure the infrastructure.

Deployment Software

Deployment[3] software helps to deploy and integrate the application on the cloud.

Server

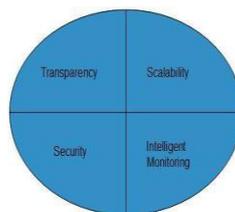
Server helps to compute the resource sharing and offer other services such as resource allocation and deallocation, monitoring resources, security, etc.

Storage

Cloud uses distributed file system for storage purpose. If one of the storage resource fails, then it can be extracted from another one which makes cloud computing more reliable.

Infrastructural Constraints

Fundamental constraints that cloud infrastructure should implement are shown in the following diagram:



Transparency

Since virtualization is the key to share resources in cloud environment. But it is not possible to satisfy the demand with single resource or server. Therefore, there must be transparency in resources, load balancing and application, so that we can scale them on demand.

Scalability

Scaling up an application delivery solution is not that easy as scaling up an application because it involves configuration overhead or even re-architecting the network. So, application delivery solution is need to be scalable which will require the virtual infrastructure such that resource can be provisioned and de-provisioned easily.

Intelligent Monitoring

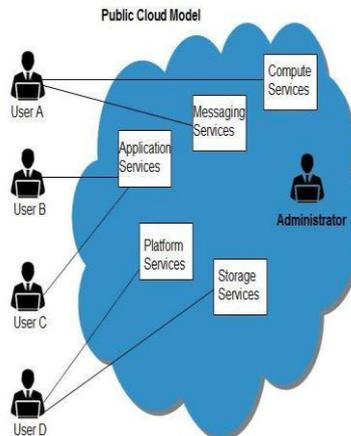
To achieve transparency and scalability, application solution delivery will need to be capable of intelligent monitoring.

Security

In the reference[6] security is elaborated. The mega data center in the cloud should be securely architected. Also the control node, a entry point in mega data center also needs to be secure.

Public Cloud Model

The Public Cloud allows systems and services to be easily accessible to general public, e.g., Google, Amazon, Microsoft offers cloud services via Internet.



Cost Effective

Since public cloud share same resources with large number of consumer, it has low cost.

Reliability

Since public cloud employs large number of resources from different locations, if any of the resource fail, public cloud can employ another one.

Flexibility

It is also very easy to integrate public cloud with private cloud, hence gives consumers a flexible approach

4. ROLE OF CLOUD COMPUTING

In lecture [7] the technologies and application of cloud computing is described. The role of cloud computing in the IOT revolution. The IOT consists of everyday objects physical devices, vehicles, buildings etc with embedded electronics, software sensors and network connectivity Since, public cloud services are delivered through Internet, therefore ensures location independence.

Utility Style Costing

Public cloud is also based on pay-per-use model and resources are accessible whenever consumer needs it.

High Scalability

Cloud resources are made available on demand from a pool of resources, i.e., they can be scaled up or down according the requirement.

The IOT generates a vast amount of big data and this inturn puts a huge strain on internet infrastructure. As a result this force companies to find solutions to minimise the pressure and solve their problem to transferring large amount of data. Cloud computing has entered the main stream of information technology providing scalability in delivery of enterprise applications and software as a service (saas) companies are nowmigrating their information operations to the cloud.

Many cloud providers can allow for your data to be either transferred via your traditional internet connection or via a dedicated direct link.. The benefit of direct link into the cloud will ensure that your data is uncontended & that the traffic is not crossing.

❖ How cloud computing complements IOT initiatives

Another benefit of cloud computing for the IOT is that cloud computing enables better collaboration which is essential for developers to store and access data remotely. Developers can access data immediately & work on projects without delay.

Finally by storing data in the cloud this enables IOT companies to change directly quickly & allocate resources in different areas. Big data has emerged in the past couple of years & with such emergence the cloud has become the architecture of choice. Most companies find it feasible to access the massive quantities of big data via cloud

HOW PINACL CAN OFFER CLOUD & IOT SERVICES

In reference [8] the literature reviewed is explained. Pinacl has extensive industry knowledge that spans over 33 years & can assist in cloud technologies & work with you at any stage of your IOT life cycle. The choice of cloud connectivity is important to the success of your cloud deployment. Pinacl can aid you with critical decision based on our extensive knowledge of hybrid data centre deployments & public cloud connectivity.



Pinnacle are one of the eight percent of UK/ EMEA resellers who are already installing IOT solutions across the UK & believe IOT is all about the art of possible.

5. SUGGESTED WORK

The demonstration project is about the implementation of the smart house on the basis of the IOT technology as well as cloud computing.

The project describes about the home automation or domotics is building automation for a home, called smart home or smart house. It involves the control & automation of lighting, heating, ventilation, air conditioning & security as well as home appliances such as washer/ dryers. Wifi is often used for remote monitoring & control.

Modern systems generally consists of switches and sensors connected to a central hub sometimes called a "gateway" from which the system is controlled with a user interface, that is interacted either with a wall mounted terminal, mobile phone software , tablet computer or a web interface.

IMPLEMENTATION

The wifi network connected to the internet can be vulnerable to hacking. Technology is still in its infancy and consumers could invest in a system that becomes abandonware. In 2014 Google bought the company selling the Revolv hub home automation system, integrated it with Nest and in 2016 shut down the servers Revolv hub depended on rendering the hardware useless.

6. APPLICATION & TECHNOLOGIES

1. Heating, ventilation & air conditioning (HVAC) it is possible to have remote control of all home energy monitors over the internet incorporating as simple and friendly user interface.
2. Lighting control system.
3. Appliance control & integration with the smart grid and a smart meter, taking advantage for instance of high solar panel output in the middle of the day to run washing machine.
4. A house hold security system integrated with a home automation system can provide additional services such as remote surveillance of security cameras over the internet or central locking of all perimeter doors and windows.

7. CONCLUSION

The users can be anywhere and at any time, day or night, you need to be able to serve them in a proper way. Cloud computing is the best way to share, receive and manage information for the internet of things. Cloud providers usually have various data centers covering different geographies which is ideal for having increased coverage.



These providers usually have a great infrastructure serve millions of user connections & they offer different products for shared load balancing, security & more. We cannot imagine an internet of things without cloud.

ACKNOWLEDGEMENT

Author Dr. Jasmine Regila Rani G.D. and Kesani Himaja Devi like to express my deepest appreciation to all those who provided me the possibility to complete this project. I am highly indebted to the " Department of the Master of Computer Application of the Loyola Academy Degree and P.G. College, Old Alwal, Secunderabad- 500010, Telangana(S), India to give us this opportunity to take part in "Integrated International Immersion Conference(IIIC).

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DEVELOPMENT IN RURAL AREAS: A CASE STUDY OF CHIEF MINISTER'S ADOPTED VILLAGE

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Abstract

India lives in its villages. Agriculture is the main occupation of rural areas. The rural population declined from 72.19% in 2001 Census to 68.84% in 2011 Census. As per 2011 Census, the total rural population of India is 83.3 crores. But the urban population has increased from 27.81% in 2001 Census to 31.16% in 2011 Census. The increase in urban population indicates lack of employment and other facilities in rural areas. So the central and state governments recognised the importance of rural development for economic growth of the country. The Government of Telangana is implementing innovative programmes not only to eradicate the rural poverty but also to provide better employment opportunities to the rural people. The Chief Minister (CM) of Telangana State, Mr. K. Chandrashekar Rao adopted two villages of Siddipet District and he is taking special interest to develop these villages as model villages for whole country in general and Telangana State in particular.

At this juncture, the present paper aims to find out various developmental programmes which are being implementing in one of the adopted villages. The researcher has gathered primary data by observation, field visits and interaction with the Village Development Committee as well as the beneficiaries of the different schemes of the adopted village. The census details of the village are taken from the secondary sources. Hence the study is based on both primary and secondary sources. The study finds that all the prestigious government programmes like Mission Bhagiratha, Mission Kakatiya, Haritha Haram and construction of Double Bedroom Houses to the poor etc. are being implemented in the adopted village. Community farming and drip irrigation system have also been practicing as part of agricultural development.

Key Words: Rural development, Adopted village, Innovative schemes, Government of Telangana

Introduction

"I would say that if the village perishes, India will perish too. It will be no more India. Her own mission in the world will get lost. The revival of the village life is possible only when it is no more exploited." – Gandhi wrote in Harijan (29 August 1936)

"The state shall, within the limits of its economic capacity and development, make effective provision for securing the right to work, to education and to public assistance in case of unemployment and in other cases of undeserved want." – Article 41 of Indian Constitution

Development is nothing but growth or evolution or stage of advancement. In the context of rural background it means developing better physical, social and economic conditions of the population living in the rural area. Whatever the geographic location, culture and historical stage of development of a society, there are at least three basic elements i.e. life sustenance, self-respect and freedom are considered to constitute the true meaning of development. The main objective of development in all societies are given below.

- To increase the availability and widen the distribution of basic life-sustaining articles such as food, clothes, shelter, health care and security.
- To increase standards of living, provision of more jobs, better education and greater attention to cultural and humanistic values.

According to Gandhi every person should be provided with minimum necessities i.e. food, clothing and shelter. Gandhi is in favour of the self-sufficient village economy where the villages will be the independent economic units. According to Robert Chambers (1983), Rural Development is a strategy to enable a specific group of people, poor rural women and men to gain for themselves and their children more of what they want and need. It involves helping the poorest among those who seek a livelihood in the rural areas to demand and control more of the benefits of rural development. The group includes small scale farmers, tenants and the landless.

The main objectives of rural development are given below.

- Improvement in levels of living, including employment, education, health and nutrition, housing and a variety of social services.
- Decreasing inequality in the distribution of rural incomes and in rural-urban balances in income and economic opportunities.
- Increasing the capacity of the rural sector to sustain and accelerate the pace of those improvements.

Even though both central and state governments have been implementing many policies, schemes and projects for social and economic development of rural areas since independence, there are is a migration of youth from rural to urban area

where there are more opportunities for the professional services as well as employment. Caste is thus gradually losing its traditional influence on the choice of occupation. Due to educational attainments and occupational mobility, joint family system is also gradually breaking. The rural society is undergoing social transformation. Most of the villages still face problems and also rural people feel themselves as a neglected lot when compare with better facilities of living and entertainment in towns and cities. In this context, the Government of Telangana has been implementing several schemes for the development of rural areas by focusing on agricultural development, which is crucial for providing employment opportunities in a large scale manner within rural areas. The government is aiming to bring 'Bangaru Telangana'. For reaching this goal, the Government of Telangana has recognised the importance of rural development and came up with new scheme called 'Grama Jyothi'. Apart from this scheme, the Government of Telangana has been implementing some other prestigious schemes like 'Mission Kakatiya', 'Mission Bhagiratha', 'Haritha Haram', 'Housing for the Poor' and 'Sheep Distribution' for the development of rural areas.

To inspire others and to become a role model for others in rural development, the Chief Minister (CM) of Telangana State, Mr. K. Chandrashekar Rao has adopted two villages namely Erravalle and Narsannapet in the District of Siddipet. He wants to develop these villages as self-sufficiency in all the aspects. He says "Unity has the strength to even break a mountain. Erravalli and Narsannapet villages should set an example of unity, which should be an inspiration for the society to follow". Finally he wants to develop these two villages as model villages for the entire country. In addition to all the government schemes, special schemes are also being implemented for socio-economic development of the people lived in these two villages.

Objective

The present paper "Development in Rural Areas: A Case Study of Chief Minister's Adopted Village" is to find out various developmental programmes/schemes/projects that are being implemented in the adopted village of Erravalle.

Methodology

To get possible answers to the research objectives of the paper, the researcher has visited Erravalle village for several times in the year of 2017. Observation method has been used one of the best tool to know the various developmental activities taken place in the village. To get primary data, the researcher conducted Focused Group Discussion with Village Development Committee (VDC) and beneficiaries of various schemes. The census details of the village has taken from the secondary sources. Hence the paper is based on empirical research.

Findings and Discussion

Erravalle village is one of the villages of Markook Mandal of Siddipet District. The area of the village is 1,111 hectares with 348 households.

Table-1 Demographic Profile of Erravalle Village

Particulars	Persons	Male	Female
Total Population	1445	717 (49.6%)	728 (50.4%)
Literates	680 (47.1%)	417 (58.1%)	263 (36.1%)
Population in the age group of 0-6	177 (12.2%)	82 (11.3%)	95 (13.1%)
SC Population	555 (38.4%)	290 (40.4%)	265 (36.4%)
ST Population	11 (0.7%)	4 (0.5%)	7 (0.9%)

Source: 2011 Census

Table-1 indicates that female population is more in Erravalle village. Male literates are more than female literates. Around 12.2% of the population is in the age group of 0-6 years. Around 38.3% of the population belong to SC category and 0.7% of the population belong to ST category.

Table-2 Industrial Category of Erravalle Village

Particulars	Persons	Male	Female
Total Workers	749 (51.8%)	390 (54.4%)	359 (49.3%)
Main Workers	367 (49.0%)	289 (74.1%)	78 (21.7%)
Marginal Workers	382 (51.0%)	101 (25.8%)	281 (78.2%)

Source: 2011 Census

Table-2 shows that around 51.8% of the persons are working in which marginal workers are more. Males are dominating among main workers whereas females are dominating among marginal workers.

Table-3 Industrial Category of Main Workers

Particulars	Persons	Male	Female
Cultivators	136	132	4
Agricultural Labourers	110	55	55
Household Industry Workers	4	0	4
Other Workers	117	102	15

Source: 2011 Census

Table-3 shows that cultivators are more among main workers of Erravalli village. Other workers and agricultural labourers are also more among main workers. Household industry workers are very less in the village. In other words the village depends on agriculture for their livelihood.

Table-4 Industrial Category of Marginal Workers

Particulars	Persons	Male	Female
Cultivators	2	1	1
Agricultural Labourers	354	93	261
Household Industry Workers	9	0	9
Other Workers	17	7	10

Source: 2011 Census

Table-4 shows that agricultural labourers are more among marginal workers of Erravalli village. Cultivators, Household industry workers and other workers are very less in the village. In other words the village depends on agriculture for their livelihood.

Amenities of the Village before Adoption

The village has one Upper Primary School and one Primary health sub centre. The village people depend on tap for drinking water. The village has one hand pump and one overhead tank. One sub post office is there. Public Call Office (PCO) and mobile phone coverage is also there in the village. Bus service is available from Gajwel. Autos and carts driven by animals are also available in the village for transportation. The village connected with other district road. Self Help Groups, Public Distribution Shop and Anganwadi centre are also available in the village.

Development in Village after Adoption

Mr. Krishna, the Vice Chairman of Village Development Committee says “the CM of Telangana State, Mr. K Chandrashekar Rao has a farm at Erravalle village. So that he wants to develop the village. And also the two adopted villages are in Gajwel Assembly Constituency, from where he was elected. He wants to take care of his own village. He believes in not only construction of roads and houses but also economic development of people by using resources. He strongly believes ‘all for all’. He wants to develop skills of individual to stand on himself which is very crucial for achieving independency of villages.”

Agricultural Development

The village has four *kuntas* (tanks) called Erragunta, Lingarajukunta, Nallakunta and Maisireddykunta. All these tanks were developed through ‘Mission Kakatiya’ scheme, which are now having capacity of 0.5 TMC of water. The water will be used for irrigation purpose. Another new tank called ‘Panduranga Cheruvu’ and two Check dams on the stream are being constructed in the village. Around 1800 acres of land is used for agricultural purpose. The main crops are Maize, Soyabean, Millets, Red gram and Bengal gram. Cultivation of cotton crop is not there. For all the fields water will be supplied by drip irrigation method, which is being maintained by ‘Metaphim’. Near to the ‘Koodavelli Vaagu’ the drip irrigation system has set up. For operation of drip irrigation, the local unemployed people have recruited and they will be given salaries every month.

Cultivation of Paddy is also very less in the village. Cultivation of vegetables is encouraged in the village, which also consumable by the villagers daily. The Kaveri Seeds Company is procuring the agricultural production from the farmers by ‘buy back’ system. Telangana Seeds Development Corporation is also purchasing the production from the farmers. The agricultural land has been divided into 8 zones in which each zone has around 200 acres of agricultural land. One Chairman has to take care of one zone. He has to suggest farmers about the crops to be cultivated for each season, package of practices in general and fertilizer application in particular for different crops cultivated in his zone and bringing of tractor for various purposes such as tilling of the land and transportation etc. Most of the farmers are having land in between 2 to 3 acres of agricultural land. The AEO and the AO show special interest for agricultural development. They will give suggestions to the farmers by considering their views on agriculture. Crop loans are being sanctioned by the banks. 24 hours power supply is being given to the irrigation purpose.

In the year of 2016, the CM of Telangana State has distributed 18 tractors with implements to the landless families in the village. The Mahendra Tractor Company has given came forward to give tractors with 100% subsidy. It is one of the step to create self-employment in the villages. He strongly believes that individual benefits would be more by practicing community farming. As part of this farming system, he appointed operators for eight zones and one operator for one fertiliser godown. The employed youth belonging to landless and poor families, thus providing them livelihood. The zone operators should ensure that water from sump houses was supplied to fields through drip irrigation. The godowns are going to be used for storage of fertilisers, which can be procured in bulk from fertiliser companies and distributed to farmers to reduce the financial burden on farmers. He assured that the Godavari water would be used for irrigating the fields through Pamulaparthi reservoir (renamed as Kondapochamma reservoir). Vermicompost is also being prepared within the village. Around 66 units of sheep were distributed to the Yadava community.

Housing (Double Bedroom) Scheme

The village has around 348 households. There was a plan that all the 348 houses should be demolished and new houses should be constructed by the government. But very few families have not taken part of this scheme voluntarily and around 300 new houses (Double Bedroom) are being constructed by Meenakshi Constructions. Each house should be constructed in the area of 200 yards with all facilities. Two bedrooms, one hall and kitchen with toilet facility should be provided with enough open space. The land has been adjusted among the neighbours of the village for construction of new houses where there was a shortage of land for any family. As part of 'Haritha Haram', each house has given five plants i.e. Guava, Curry leaves, Lemon, Coconut and Rose. Two buffalos/cows, 10 country chicken were distributed to all the families. Woman is the head of the family in the village.

Infrastructural Development

Around 12 km of CC road has also sanctioned for all streets of the village. Solar power has been using for the domestic purpose. A four line metal road has constructed for 1km length within the village with central lighting system. Around 12 km length of underground drainage system has constructed in the village. It is an Open Defecation Free (ODF) village. For the purpose of conducting meetings, celebrating marriages and also for conducting training programmes, one 'Auditorium cum Community Hall' has constructed. Erragunta should be developed as like as 'tank bund' of Hyderabad. 'Bathukamma Cheruvu' is also being constructed near by the community hall.

In 2016, Telangana Grameena Bank has started functioning within the village and all the persons of two adopted villages opened their Savings Account in the bank. Cashless transactions are also going on in the village. One sub-station for electricity came into existence in the village from 2016. Internet facility is going to be provided by the Reliance. CC cameras are also set up in the villages. Drinking water will be provided through 'Mission Bhagiratha' scheme. There is a ban on selling of alcohol in the village.

Mr. Krishna, the Vice Chairman of VDC reminds the CM's view on shopping complex that the villages would have one-stop-shops for buying clothes and footwear and also a hotel, a market and few other stores which would be run by the landless and poor people of the villages by which local economy would become self-sufficient.

Buildings under Construction

The budget has allocated to the construction of the building in the village. The following buildings are being under construction at the time of data collection/field visits by the researcher.

- Anganwadi centre
- Library
- Primary Health Centre
- Children's Park
- Upper Primary School
- Grama Panchayat
- Veterinary dispensary
- Mahila Bhavan
- Bank
- Shopping Complex
- Bus Shelter
- Vegetable Market

Mr. Laxma Reddy says "Most of the parents are sending their children to government school only. For ensuring cleanliness in the village, colony wise committees has been set up. Village Development Committee (VDC) reviews the progress of the village and come with the new proposal for village development."

One member nominated by District Collector, MPTC, Sarpanch, two members from each caste and one woman from Self Help Groups are the members of VDC. The total members of the committee should be 25. The decisions taken by the VDC should be followed by the villagers. The Sarpanch acts as Chairman and Vice Chairman should be elected by the members of the committee and the District Collector is the in charge of the committee.

All the youth clubs were merged and only one youth club namely 'Bangaruvalli Yuvasena' has emerged. One meeting should be organized on 3rd Sunday of every month. Rachabanda is there in the village to solve the disputes among the villagers. Direct bus service is available to Hyderabad from the village.

The villagers want to set up an industry by the government so that most of the youth is going to be employed. Household industry should be promoted in the village for giving employment opportunities to the women. Based on the resources available in the village, the industries should be established. Boundary path should be constructed around the village. Literacy should be increased. Everybody should get employment. The government should release development fund to the VDC. The village should be developed as a model for self-sufficiency.

Conclusion

The Chief Minister of Telangana, Mr. Chandrashekar Rao says “Our villages need to become self-sustained and self-supported villages. We should forget any past enmity between us and work towards building healthy relationships.” If all the villages will develop in this manner, the migration of the villagers to towns/cities will be decreased. Most of the amenities, which are available in the urban areas are provided in Erravalle village. The farmers are practicing community farming. It is an ODF village. Cleanliness has given priority by the villagers. The construction of the houses has successfully completed and the villagers are residing happily. Agricultural development is very crucial for rural development. Hence the CM has also focused on agriculture. The revival of tanks has done on war foot basis for increasing irrigation facilities. All the prestigious schemes of the Government of Telangana are being implementing in this village. Apart from this schemes, the CM takes special initiation and interest to develop the village in all aspects. Employment opportunities has provided to the landless youth within the village. By taking inspiration from the CM, some of the Ministers, MPs and MLAs of Telangana State have adopted few villages. But those villages have not achieved good results like this village. We have to search reasons for failure that whether the political commitment is lacking or villagers’ commitment is lacking in those villages. Anyhow, instead of developing all the villages, developing only one village is a big question in a democratic country like India.

Acknowledgements

I would like to extend my sincere thanks to Prof. Nagaraju Gundimeda, Department of Sociology, University of Hyderabad for academic insights and Dr. K. Krishna Mohan, Associate Professor, Department of Agricultural Science and Rural Development, Loyola Academy for motivating me to come up with this paper. I also extend my sincere thanks to Mr. Abhilash, who helped me in data collection.

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WEB SERVICE SECURITY

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Abstract :-A web service is a software system that is designed to support machine to machine interoperable interaction of systems over a network. Web services provide a framework for system integration without depending on programming language and operating system. It is widely deployed in current distributed systems and has become the technology of choice. The Web services have become more suitable now for integrating heterogeneous systems and are largely facilitated through its extensive use of the Extensible Markup Language (XML). Hence, the security of Web services based system depends not only on the security of the services but also on the confidentiality and integrity of the XML based SOAP messages that are used for communication. Now-a-days, Web services have generated huge interests in vendors and researchers. A web service is based on existing Internet protocols and open standards, and also provides a flexible solution to various problem of application integration. This paper provides an overview of the web services, web service security and the various algorithms used for encryption of the SOAP messages.

Keywords: Web service, Web services security, Web services security standards.

1.INTRODUCTION

A web service is a network accessible interface to various application functionalities, built using standard Internet technologies illustrated in Figure 1.

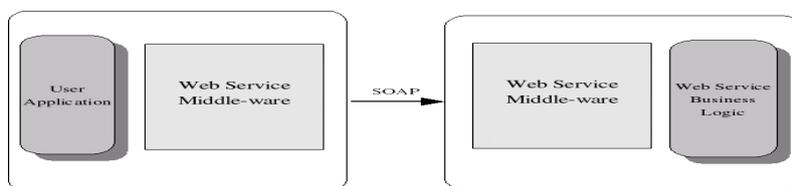


Figure 1. A web service allowing access to application code

In other words, if an application can be accessed over a network using some combination of protocols like HTTP, XML, SMTP, or Jabber, then it is a web service. A web service can also be defined as a software system designed to support interoperable machine to machine interaction over a network. Web services provide a framework for system integration without being dependent of programming language and operating system. A web service is an interface that is positioned between the application code and the user of that code as shown in figure 2. Web service acts as an abstraction layer, this layer separates the platform and the programming language specific details of how an application code is actually invoked, and this standardized layer shows that any language that supports the web service can also access the application's functionality.

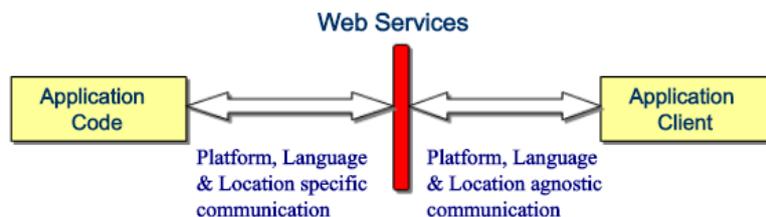


Figure 2. Web services providing an abstraction layer between the application client and its code

Now-a-days the web services that we see deployed on the Internet are HTML web sites. In these, the application services that are the mechanisms for publishing, managing, searching, and retrieving contents are being accessed through the use of standard protocols and data formats like HTTP and HTML. Client applications (various web browsers) that understand these standards can interact with the application services to perform various tasks like ordering books, sending greeting cards, or reading news etc. As this standard based interface provides abstraction, it does not matter whether the application services are written in Java and the browser written in another language like C++, or the application services deployed on a Unix box or any other system while the browser is deployed on Windows. Web services also allow for cross platform interoperability that makes the platform irrelevant and is one of the key benefits gained from implementing web services. There is currently an ongoing effort within the Java community to define an exact architecture for implementing web services within the framework of the Java 2 Enterprise Edition specification. Each of the major Java technology providers such as Sun, IBM, BEA, etc. are all working to enable their platforms for web services support and many significant application vendors such as IBM and Microsoft have completely embraced web services. Today IBM is integrating web services support throughout their Web Sphere, Lotus, and DB2 products, and Microsoft's new .NET development platform is built around web services that are a messaging framework. The requirement placed on a web service is only that it must be capable of sending and receiving the messages using some combination of various standard Internet protocols. The Web

service are in more use and being suitable for integrating heterogeneous systems and is largely facilitated through its extensive use of the Extensible Markup Language (XML). The interface of a Web service is described using the XML based Web Services Description Language (WSDL). The communication is performed using XML based SOAP messages. Hence, the security of a Web services based system depends on the security of the services themselves as well as on the confidentiality and integrity of the XML based SOAP messages used for communication. The Organization for the Advancement of Structured Information Standards (OASIS) and the World Wide Web Consortium (W3C) has standardized several specifications that are related to security in Web services and XML. Now-a-days web services are emerging as a systematic and extensible framework for application to application interaction and are built on top of existing Web protocols and open XML standards. Web services are a new class of Web applications and are self-contained, self-describing, modular applications that can be published, located, and invoked across the Web. Web services perform various functions that can be anything like from simple requests for information to creating and executing complicated business processes. If a web service is deployed once, it can be discovered and invoked by the other applications or other Web services. The advantage of using Web services is the ability to create applications through the use of loosely coupled and reusable software components; this has fundamental implications in technologies and business applications. The business services can be reorganized and distributed over the Internet and also can be accessed by a wide variety of communications devices. Businesses can be released from the load of complex, low and costly software integration and focus instead on the value of their offerings. In this way, the Internet will become a universal platform where organizations and individuals converse with each other to carry out various commercial activities and to provide value added services. The fences to provide new offerings and entering new markets will be hand down to enable access for small and medium sized enterprises. Dynamic enterprises and dynamic value chains become reachable and may be even fixed for competitive advantages. The Web services background is divided into three areas — communication protocols, service descriptions, and service discovery and specifications are being established for each. The following specifications are presently most stable in each area:

1. The simple object access protocol (SOAP) that enables communications among Web services. It is fundamentally a stateless and a one way message exchange standard that enables applications to create more difficult interaction patterns like request/response, request/multiple responses, etc. by combining one way exchanges with types provided by an underlying protocol and application detailed information.
2. The Web Services Description Language (WSDL) that provides a formal, computer-readable description of Web services. It provides a model and an XML format for labeling Web services. WSDL defines services as groups of network endpoints or ports.
3. The Universal Description, Discovery and Integration (UDDI) directory that is a registry of Web services descriptions. It provides a mechanism for clients to discover Web services. Web services are important only if potential users may find information appropriate to permit their execution.

II. LITERATURE REVIEW

The amazon web services provided an overview of the various security processes they have used for providing security to web services . Joe M. Tekli, Ernesto Damiani, Richard Chbeir and Gabriele Gianini gave an overview of current research related to SOAP processing performance enhancement that focused on similarity based methodologies, as well as the web service Security optimizations, and XML parallel processing structural designs. Most methods form on the observation that SOAP message exchange usually includes highly similar messages. They identified the collective parts of SOAP messages, to be processed once, only restating the processing for parts which are unlike, and reducing SOAP processing overhead [2]. Nils Agne Nordbotten has provided an overview of recent security standards for XML and Web services. These standards provide a stretchy framework for fulfilling basic security requirements such as confidentiality, integrity, and authentication, as well as more difficult requirements such as, authorization, and federated identities. Various mechanisms such as those provided by Web Services Policy and the Web Services Description Language (WSDL) may also provide appreciated sources of information to an attacker who is trying to find weaknesses in a system. Though XML firewalls may be able to identify messages trying to feat these vulnerabilities, the use of end to end encryption may effectively inhibit such detection [3].

Hongbing Wang,Joshua Zhexue Huang, Yuzhong Qu,Junyuan Xie have presented the basic idea about Web services. They presented three aspects of Web services that are the service security, the service composition, and the service semantics. They are dangerous to the successful utilization of Web services [4].

Doug Tidwell, James Snell, Pavel Kulchenko has mentioned in their book that a critical insight is that web services don't replace current technology infrastructures. Rather, they help to incorporate existing technologies. If one needs a J2EE application to talk to another application than web services makes it easier. Web services won't completely replace old mainframe system in the back private that nobody ever thinks about anymore. But web service provides cross platform automated access to the mainframe's applications, hence opening new networks of business [5].

III. SYSTEM OVERVIEW

The Web Services architecture is based upon the three roles that interact with each other as service provider, service registry and service requestor. These interactions involve publish, find and bind operations. These roles and operations together act upon the Web Services artifacts that are the Web service software module and its description. A service provider hosts a network reachable software module that is an implementation of a Web service. The service provider describes a service description for the Web service and publishes it to a service requestor or service registry. The service requestor makes use of the find operation to recover the service description or from the service registry and uses the service description to bind with the service provider and raise or interact with the Web service implementation. Service provider and service requestor roles are the logical constructs and a service can reveal characteristics of both. Figure 3 illustrates these operations, the components providing them and their interactions.

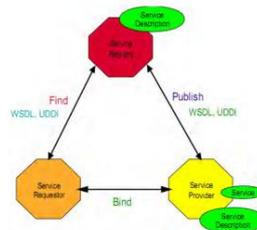


Figure 3: Web Services Architecture

Three Roles in Web Services Architecture

1. Service provider: This is the owner of the service from business point of view and from an architectural point of view; this is the platform that hosts access to the service.
2. Service requestor: This is the business that requires certain functions to be satisfied from business point of view and from an architectural point of view, this is the application that is looking for and invoking or initiating an interaction with a service. The service requestor role can be played by a browser obsessed by a person or a program without any user interface.
3. Service registry: It is a searchable registry of service descriptions where service providers publish their service descriptions. The service requestors find services and obtain binding information in the service descriptions for services during the development for static binding or during execution for dynamic binding. The service requestors can obtain a service description from other sources additional to a service registry, such as a Web site.

A. The Operations in Web Service Architecture

To take advantage of Web Services for any application, the three behaviors should take place: Publication of service descriptions, finding of service descriptions, and binding of services based on the service description. These behaviors can occur iteratively and these operations are as follows:

1. Publish: A service description needs to be published to be accessible so that the service requestor can find it, where it is published can vary depending upon the requirements of the application.
2. Find: In the find operation, the service requestor recovers a service description directly or requests the service registry for the kind of service required.
3. Bind: A service needs to be invoked. In the bind operation the service requestor invokes or initiates an interaction with the service at runtime using the binding details in the service description to locate, contact and invoke the service.

B. The Artifacts of a Web Service

4. Service: A service is where a web service acts as an interface that is described by a service description and is implemented. It is also a software module deployed on network available platforms provided by the service provider. It exists to be raised by a service requestor. It can also function as a requestor, using other Web Services in its implementation.
5. Service Description: The service description contains the details of the interface and implementation of the services. This includes its data types, operations, binding information and network location. It could also include classification and other metadata to facilitate the various discoveries and utilization made by service requestors. The service description may be published to a service requestor or service registry. The Web Services structural design explains how to instantiate the elements and implement the operations in an interoperable way.

IV. WEB SERVICES SECURITY

In web services background, security means that the recipient of a message should be able to validate the reliability of a message and to make guaranteed that it has not been altered. Web Service Security defines the tool to include integrity, confidentiality, and single message authentication structures within a SOAP message. Web Service Security uses the XML Signature and XML Encryption specifications as well as defines how to include digital signatures, message digests, and encrypted data in a SOAP messages. Web Service Security is apprehensive with security for SOAP messages, and hence

web service security clearly builds on uppermost of SOAP. Web service security also makes use of XML Signature and XML Encryption. The Web Services Security provisions aim to provide an outline for building secure web services using SOAP and consist of a core specification and numerous additional profiles. XML Encryption is being utilized to provide confidentiality, while message integrity is provided through the use of XML Signature through which the SOAP message body elements, selected headers or any combination may be signed or encrypted using unlike signatures and encryptions for unlike SOAP roles that because SOAP message headers may be subject to processing and modification by SOAP intermediaries, lower layer security mechanisms such as SSL are unsatisfactory to ensure end to end integrity and confidentiality for SOAP messages. The functionality providing web service security is needed if confidentiality and integrity are required for such messages. A major performance traffic exist in SOAP message processing and the reason for SOAP performance criticality is because of two reasons as: On one side, SOAP communication creates network traffic, and causes higher potential than the other competing technologies. On the other side, and perhaps more importantly, the generation and parsing of SOAP messages and their conversion to and from in memory application data can be computationally very expensive. Since the XML encryption doesn't provides security in web services and hence an algorithm can be used to provide security to web services. However, the recent Web services architectures are antagonized with a few problems like security and many algorithms is used for performing cryptographic operations with symmetric key based security symbols. Current XML encryption used is symmetric key encryption and authenticity of message can't be assured. Public key encryption allows the use of RSA which enables the recipient of a message to verify that the message is really from a particular source. The recipient might receive a message privately so that unauthorized users could not read it, know the identity of the sender and determine whether or not the center is authorized to carry out the operation requested in the message and these are frequently met through encrypting messages. Security is difficult to the adoption of Web services by various enterprises, but the Web services structure does not meet simple security requirements. The point that the Web services involve exchange of messages means that securing the message exchange is an important issue to consider when building and using Web services. On the other side, because Web services allows all the internal systems as well as external systems to communicate on HTTP ports, these application servers are predictably opened up to application level attacks. Some few standards have been introduced to improve the message security problems, including web service security and various other enterprises towards enabling digital signatures on XML messages and the transactions.

There are four basic security requirements that the Web Services security layer must provide as follows:

1. Confidentiality, where information is not made available or disclosed to unauthorized individuals, entities, or processes, and it also guarantees that the contents of the message are not disclosed to unauthorized individuals.
2. Authorization is the yielding of authority, which includes the conceding of access based on access rights and also guarantees that the sender is authorized to send a particular message.
3. Data integrity is the property that data has not been undetectably changed or damaged in an unauthorized manner or by unauthorized users thereby ensuring that the message was not altered accidentally in transit.
4. Proof of origin is indication that identifies the originator of a message or data. It states that the message was transmitted by a properly identified sender and is not a replay of a previously transmitted message. This requirement implies data integrity.

V. SECURITY ALGORITHMS

Web Service security is big challenge for researchers as it requires a strong security algorithm for the encryption of data. The xml encryption scheme is being used presently for encrypting the messages between the different programming languages running on different platforms, but this xml encryption algorithm is symmetric key encryption algorithm and it creates communication overhead, hence there is need to use an asymmetric key encryption algorithm. The more powerful version of DES is used for high security called Triple-DES. To start encrypting with Triple-DES, two 56-bit keys are selected and the data is encrypted via DES three times, the first time by the first key, the second time by the second key and the third time by the first key once more. This process creates an encrypted data stream that is unbreakable with today's code-breaking techniques and existing computing power, while being compatible with DES. Today, the National Institutes of Standards and Technology considers DES an absolute technology that is suitable only for legacy applications and supports a new standard called Advanced Encryption Standard. AES is a newer encryption standard and is now the preferred one to use for XML Encryption. AES is a substitution linear transformation network having 10, 12, or 14 rounds, depending on the various key sizes which are currently set at 128, 192, or 256 bits. The block size used in AES is 16 bytes and the data block to be processed is divided into an array of bytes developing a matrix with rows and columns. Symmetric ciphers uses the same key for encryption and decryption that means both sides need to have it, and it needs to be kept secret, because anyone knowing the key can decrypt all messages encrypted with it. DES and AES are the examples of symmetric ciphers. Asymmetric ciphers use two types of keys, a public key for encryption and a private key for decryption. The advantage is that there is no damage in communicating the public key to anyone because it cannot be used to decrypt any data. Whereas the private key doesn't need to be sent to anyone and is easier to keep secret. RSA is an example of an asymmetric cipher and these ciphers are generally more compute intensive and hence they are hardly used to encrypt messages of large size. AES and DES are symmetric cipher that means that both parties must know a shared key. The problem of distributing the key is not small, and there exist well known algorithms for doing this. RSA algorithm is an asymmetric key encryption algorithm and is widely known for its security empowerment. RSA involves a public key and a

private key. The public key can be known by everyone and is used for encrypting messages. Messages encrypted with the public key can only be decrypted in a reasonable amount of time using the private key. But RSA key size is 1024 and this increases the communication overhead. Hence it can be implemented according to the priority of messages by using the various key sizes of RSA. Lower the priority of messages lower will be the key size, higher the priority of messages higher will be the key size. Another algorithm used for encryption is SHA-1 algorithm. It produces a 160-bit hash value that is typically expressed as a hexadecimal number that is 40 digits long. SHA-1 is the most widely used of the existing SHA hash functions and is employed in several broadly used applications and protocols. SHA-1 appears to provide greater resistance to attacks as its implementation increases the security.

VI. PROPOSED SYSTEM

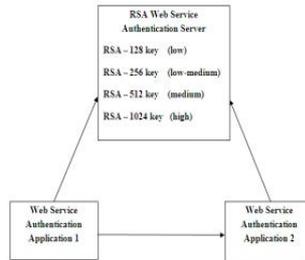


Figure 4: Web Service Secure Communication

Since Web Service security is big challenge for researchers as it requires a strong security algorithm for the encryption of data, the security algorithms mentioned above can be used for key generation and encryption of the messages. The RSA algorithm is known for its security empowerment and hence it can be used for key generation but as there are many challenges in RSA implementation for web services, the proposed system will design a security policy for RSA implementation as shown in the figure 4. There are four types of keys that can be generated with RSA algorithm i.e. 128, 256, 512, 1024 bit key size. Key size will be chosen depending upon level of confidentiality i.e. low, low-medium, medium and high. If a message is not so confidential message then it will be encrypted with 128 bit key. If request message is more confidential like checking balance in bank then it will be encrypted with 256 or 512 bit key. If request message is most confidential like transferring money in bank then it will be encrypted with 1024 bit key. Separate third party secure server will look after for RSA key generation. With this security policy communication overhead will decrease substantially. Whereas SHA-1 will be used for encryption and decryption of the messages as it provides greater resistance to the attacks.

VII. CONCLUSION

In this paper we have presented Web services, an emerging technology for the Web, The web service overview and the various security issues occurred in the implementation of the xml encryption of the messages. The security of web services is an important aspect and hence a security algorithm is required to implement in web services for key generation and encryption decryption of the messages. The security algorithm described in this paper will be used together in combination for key generation and encryption decryption of the messages which will provide strong security in web services.

ACKNOWLEDGEMENT

Author Dr. Jasmine Regila Rani G.D. and Kessy Alex like to express my deepest appreciation to all those who provided me the possibility to complete this project. I am highly indebted to the " Department of the Master of Computer Application of the Loyola Academy Degree and P.G. College, Old Alwal, Secunderabad- 500010, Telangana(S), India to give us this opportunity to take part in "Integrated International Immersion Conference(IIC).

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A ZYNQ EVALUATION AND DEVELOPMENT BOARD BASED Z-QUAD FOR PRECISION AGRICULTURE

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Abstract: In the present generation and for the future generation the Quadcopters will play a vital role in helping human person in doing many works where surveillance and security becomes a primary concern especially in the Agriculture sector. Currently we have quads mostly working on the Arduino controllers and some using the ARM controllers. Taking this a step further I am using Zed (Zynq Evaluation and Development) board in the Quad and so I have named it Z-Quad. The Z-Quad having a Zed board is very much compatible to many on board peripherals of our concern whereas with the other controllers it is very much limited. In this paper I have developed a model that caters to Precision Agriculture. I have used VIVADO platform in the Linux OS and the corresponding SDT (Software Development Tool) in executing the code. The Triple Timer Counters play a vital role in driving the BLDC (Brushless DC) motors.

Keywords: Quadcopter; Precision Agriculture; Electronic Speed Controller; Zed Board; Vivado; Triple Timer Counter; Zynq-7000; All Programmable System on Chip; Programmable Logic; Processing System.

1 INTRODUCTION

Z-Quad is based on the Zynq®-7000 family. This family is based on the Xilinx® All Programmable System on Chip (AP SoC) architecture. Thus Z-Quad integrates a feature-rich dual-core ARM® Cortex™-A9 MPCore™ based processing system (PS) and Xilinx programmable logic (PL) in a single device, built on a state-of-the-art, high-performance, low-power (HPL), 28 nm, and high-k metal gate (HKMG) process technology. The ARM Cortex-A9 MPCore CPUs are the heart of the PS which also includes on-chip memory, external memory interfaces, and a rich set of I/O peripherals which is very much lacking in the Arduino Uno and ARM Controller units [1].

The estimation of the position is a very challenging task as the contact-type sensors like the rotary encoder cannot be used. Many studies have been made on contactless sensors such as cameras or laser range sensors for self-localization and building maps [2]-[7]. In all the approaches [4][5][6][7] proposed they aim at helping the Quadcopter to navigate and for surveillance only in the indoor environment. The requirement is that we need an accurate and real-time self-localization and mapping method in the outdoor real-time framework without GPS (Global Positioning System).

There are two important facts to be noted. The first is that the Quad becomes large and heavy because of the on-board systems [4][5][6][7]. It also becomes heavy in the sense that current vision-based self-localization and mapping algorithms like PTAM (Parallel Tracking and Mapping) [11] requires much calculation and it becomes a heavy task. The second is that two separate circuit boards are used in most of the systems. First board is used as an embedded Linux control processing unit used for high level calculation. In this image processing and task scheduling is done. Second board is a micro-controller unit board used for low level processing. In this, communication to sensors and actuators is done by calling the functions that are needed to be called and finished in real time framework.

In the similar frame of networking Arduino Uno and ARM controllers were used to address the concerns. Even FPGA technology was also used to address the concern. For low level missions and limited calculations it was sufficient but for the high level missions it was hard for the Arduino Uno and ARM controllers to tackle. The requirement was that it needed high end calculations with rich memory resources. This is very much found in the Xilinx® Zynq®-7000 All Programmable System on Chip (AP SoC) architecture. It includes an ARM 9 dual-core CPU and FPGA in one-chip. Without using two different circuit boards the dual-core CPUs enable the Z-Quad to operate at two different levels of tasks. Furthermore, the embedded FPGA system enables high speed signal processing such as image and sound processing in parallel and sharing memory with two CPUs. The Linux operating system which has been developed in the Zynq community can be installed in one or two of the CPUs. Thus, the Linux-based applications of the Z-Quad can be built with open-source libraries such as OpenCV and Julius in combination. In this paper, we present an approach to build a novel size Linux-based, FPGA-based onboard Z-Quad system with the Zynq-7000 AP SoC.

2 Zed Board Architecture

The Zed Board of the Zynq®-7000 family is based on the Xilinx® All Programmable SoC (AP SoC) architecture as shown in figure 1. This board integrates a feature-rich dual-core ARM® Cortex™-A9 MPCore™ based processing system (PS) and Xilinx programmable logic (PL) in a single device, built on a state-of-the-art, high-performance, low-power (HPL), 28 nm, and high-k metal gate (HKMG) process technology.

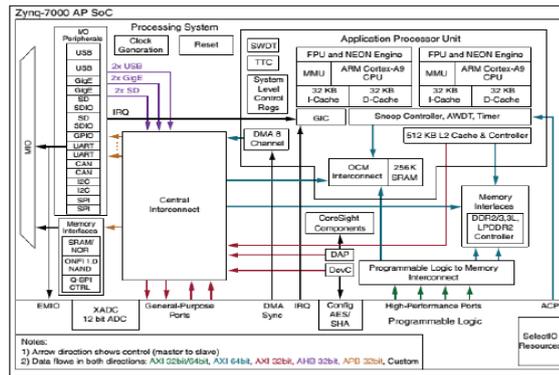


Fig.1: Zynq-7000 AP SoC

The ARM Cortex-A9 MPCore CPUs are the heart of the PS which also includes on-chip memory, external memory interfaces, and a rich set of I/O peripherals. The Zed board offers the flexibility and scalability of an FPGA, while providing performance, power, and ease of use typically associated with ASIC and ASSPs. The range of devices in the Zed board of the Zynq-7000 AP SoC family enables designers to target cost-sensitive as well as high-performance applications from a single platform using industry-standard tools. While each device in the Zynq-7000 family contains the same PS, the PL and I/O resources vary between the devices. As a result, the Zed board of the Zynq-7000 AP SoC devices is able to serve a wide range of applications [1].

3 Applications of the Zed Board

The following are the applications of the Zed Board:

- (i) The Zed boards are very much used in automotive driver assistance. This application is very much visible in the Z-Quad. It gives the information of the driver and all the information of the on-board peripherals.
- (ii) The Zed board can be used by a camera to broadcast in the real time framework. This application is used very much in the Precision Agriculture so as to get the real time information of the crop and accordingly an action could be taken by the Z-Quad.
- (iii) The Zed board is also used in the Industrial motor control especially with regard to the speed of the motor. This aspect is used in the Z-Quad for increasing or decreasing the speed of the Brushless DC Motors so as to change the direction of the Z-Quad through Yaw, Pitch, Throttle and Roll. It is also used in the industrial networking and as a vision of the machine.
- (iv) The Zed board is very much in tune with the Internet Protocol. Thus GPS, WI-FI and all the smart accessories can be configurable on the Zed board.
- (v) The Zed board is compatible with Long-Term Evolution (LTE) standard. It is a standard for high-speed wireless communication for mobile phones and data terminals, based on the GSM/EDGE and UMTS/HSPA technologies. It increases the capacity and speed using a different radio interface together with core network improvements.
- (vi) The Zed boards are applicable in the area of Medical Diagnostics and imaging.
- (vii) Generally Printers perform a single function but through the Zed boards the Printers perform many functions.
- (viii) The Video and the night vision equipment are interfaced easily with the Zed board.

The Zynq-7000 architecture of the Zed board conveniently maps the custom logic and software in the PL and PS respectively. It enables the realization of unique and differentiated system functions. The integration of the PS with the PL provides levels of performance that two-chip solutions (for example, an ASSP with an FPGA) cannot match due to their limited I/O bandwidth, loose-coupling and power budgets. Xilinx and the Xilinx Alliance partners offer a large number of soft IP modules for the Zynq-7000 family. Stand-alone and Linux device drivers are available for the peripherals in the PS and the PL from Xilinx and additional OSes and board support packages (BSPs) from partners. The award-winning ISE® Design Suite: Embedded Edition development environment enables a rapid product development for software, hardware, and systems engineers. Many third-party software development tools are also available [1].

4 Z-Quad Architecture

The Architecture of Z-Quad consists of three main features as shown in figure 2.

The First is that, the Z-Quad is pre-built with the Linux-based software development tools. The commands for flying applications are written by the users in C language by themselves and compilation is done using the library programs in the Z-Quad. They can also combine their own program with an open-source library of image processing and sound recognition engine. All programs are loaded to the Zynq chip from a single micro SD card, in which the Linux file system including the user’s programs exists. For this reason, building IDE(Integrated Development Environment) and installing a writer program to send a binary stream to the external flash memory is not required with a host computer.

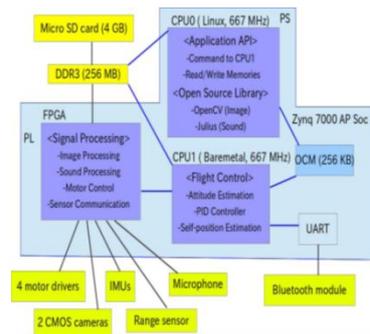


Fig 2:Z-Quad Overview

The second is that FPGA technology enables fast and efficient signal processing. The Z-Quad system has two CMOS cameras and PDM(Pulse Density Modulation) microphone, and both of them require strict timing to be processed correctly. FPGA makes it possible to preprocess images and sound. Thus the resources of the dual-core CPUs can be used very efficiently.

The third is that Z-Quad is the only quad operational using the Zed board. It comes installed with the Linux operating system and is able to fly autonomously with an on-board intelligence by estimating its position in the real-time. The high processing speed and its high end calculations support it to take up missions that are very typical in Precision Agriculture.

5 Hardware Components

5.1 *Zed Board*: This is the heart and soul of the Z-Quad as shown in figure 3.



Fig 3: Zed board

The following are its features:

- 5.1.1 Processor-Zynq™-7000 All Programmable (AP) System on Chip (SoC) XC7Z020-CLG484-1.
- 5.1.2 Memory-512 MB DDR3, 256 Mb Quad-SPI Flash and 4 GB SD card.
- 5.1.3 Communication-Onboard USB-JTAG Programming, 10/100/1000 Ethernet, USB OTG 2.0 and USB-UART.
- 5.1.4 Expansion connectors-FMC-LPC connector (68 single-ended or 34 differential I/Os),

5Pmod™ compatible headers (2x6) and Agile Mixed Signaling (AMS) header.

5.1.5 Clocking-33.33333 MHz clock source for PS and 100 MHz oscillator for PL.

5.1.6 Display-HDMI output supporting 1080p60 with 16-bit, YCbCr, 4:2:2 mode color, VGA output (12-bit resolution color) and 128x32 OLED display.

5.1.7 Configuration and Debug-Onboard USB-JTAG interface and Xilinx Platform Cable JTAG connector.

5.1.8 General Purpose I/O-8 user LEDs, 7 push buttons, and 8 DIP switches.

5.2 *BLDC (3000mAh, 25C)*: Brushless DC electric motor also known as electronically commutated motors are synchronous motors that are powered by a DC electric source via integrated inverter/switching power supply, which produces an AC electric signal to drive the motor. A BLDC motor for quadcopter is constructed with a permanent magnet rotor and wire wound stator poles.

5.3 *ESC*: Electronic Speed Controller (ESC) is used to control BLDC motor. It takes signal from microcontroller of the Zed board and breaks into three parts and sends it to the BLDC motor. We would require four ESCs as we are using four BLDC motors. The ESC is an inexpensive motor controller board that has a battery input and a three phase output for the motor. Each ESC is controlled independently by a PPM signal (similar to PWM). The frequency of the signals vary, but for a Quadcopter it is recommended the controller should support high enough frequency signal, so the motor speeds can be adjusted quick enough for optimal stability.

5.4 *Accelerometer Sensor*: This sensor is a digital-output triple-axis accelerometer with a programmable full scale range of $\pm 2g$, $\pm 4g$, $\pm 8g$ and $\pm 16g$. The integrated 16-bit ADCs enable simultaneous sampling of accelerometers while requiring no external multiplexer. The Accelerometer normal operating current is $500\mu A$. The Low power accelerometer mode current

is 10 μ A at 1.25Hz, 20 μ A at 5Hz, 60 μ A at 20Hz, and 110 μ A at 40Hz. It has a good orientation detection and signaling, Tap detection, User-programmable interrupts, High-G interrupt and User self-test.

5.5 Gyroscope Sensor: This Sensor has Digital-output X-, Y-, and Z-Axis angular rate sensors (gyroscopes) with a user-programmable full scale Range of ± 250 , ± 500 , ± 1000 , and $\pm 2000^\circ/\text{sec}$. The External sync signal connected to the FSYNC pin supports image, video and GPS synchronization. The Integrated 16-bit ADCs enable simultaneous sampling of gyros. It has Enhanced bias and sensitivity temperature stability which reduces the need for user calibration Improved low-frequency noise performance. It has Digitally-programmable low-pass filter. The Gyroscope operating current is 3.6mA. Its standby current is 5 μ A. It has a Factory calibrated sensitivity scale factor. It has the provision for User self-tests.

5.6 Radio receiver: This receives 2.4GHz signals coming from the transmitter side. It has got six independent channels to receive the signal from the transmitter and then send the signal to the microcontroller for further processing. Its current consumption is less than 40 mA and works on 5 volt power supply.

5.7 LiPO Battery: Lithium batteries are the preferred power sources for most electric modellers today. They offer high discharge rates and a high energy storage/weight ratio. However, using them properly and charging them correctly is no trivial task.

5.8 DC Voltage Supply: A power supply is an electronic device that supplies electric energy to an electrical load. The primary function of a power supply is to convert one form of electrical energy to another and, as a result, power supplies are sometimes referred to as electric power. 30 RPM Side Shaft 37mm Diameter Compact DC Gear Motor is suitable for small robots automation systems. It has sturdy construction with gear box built to handle stall torque produced by the motor. Drive shaft is supported from both sides with metal bushes. Motor runs smoothly from 4V to 12V and gives 30 RPM at 12V. Motor has 6mm diameter, 22mm length drive shaft with D shape for excellent coupling with internal hole. It weighs 125gm.

5.9 Camera: Video input is generated by the VITA-2000 image sensor from ON Semiconductor, which is configured for 1080p60 resolution. The raw Bayer sub-sampled image is converted to an RGB image by an image processing pipeline implemented using LogiCORE™ IP video cores that remove defective pixels, de-mosaic, and color-correct the image. A video frame buffer is implemented in the processing system (PS) DDR3 memory, making images accessible to the ARM® processor cores via the AXI Video Direct Memory Access (VDMA). The video framebuffer is not required for the operation of the image processing pipeline, but is included in the design to enable the capture of input video images for analysis[8].

6 Software Components

In this part we need to create a Zynq-7000 processor based design and instantiate IP in the processing logic fabric (PL) to complete our design. Then we need to take the design through implementation, generate a bitstream, and export the hardware to Software Development kit (SDK).

The following is needed in order to proceed further:

- Vivado w/ Xilinx SDK (tested, version 2013.2)
- Zed board (tested, version D)

There are two parts in this they are: The first part deals with Building a Zynq-7000 Processor Hardware. It has the following steps namely:

- Step 1: Start the Vivado IDE and Create a Project
- Step 2: Create an IP Integrator Design
- Step 3: Customize Instantiated IP and Use Block Designer Assistance
- Step 4: Generate HDL Design Files
- Step 5: Implement Design and Generate Bitstream
- Step 6: Export Hardware to SDK

The second part deals with Building a Zynq-7000 Processor Software. It has the following steps namely:

- Step 1: Start SDK and Create a Software Application
- Step 2: Run the Software Application-In this step we also need to add a Breakpoint.
- Step 3: Executing the Software[9]

6.1 Linux system: There are two steps involved over here. The first is to launch a serial console programme. The second step is the Users login to the Linux operating system. This will establish connection to a Bluetooth module. This module is connected to a UART module in the PS system of Zynq. There is no need to install a cross-compile development and writer program to user's host computer since tools for building programs are already installed in the on-board Linux system. The Linux kernel image and root file systems (Ubuntu 12.11) are provided by Linaro. The software library is coded for flying applications in Linux in Embedded C language so that users can make their own program combined with other open-source libraries. The software library consists of low level communication with CPU1 and the PL system by reading or writing the content in OCM and DDR3. The following operations are supported in the software library.

- The four states of the quadcopter (going up, hovering, going down and stop)

- Setting desired roll, pitch, and yaw angle.
- Setting desired position and gain on basis of self-position estimation.
- Reading the image and sound data.
- Calibrating flying parameters and bias of thrusts.

Image processing and sound recognition are possible by compiling programs with OpenCV or Julius library.

6.2 Baremetal System: The baremetal system runs on CPU1. The stability in the control unit of the quadcopter is achieved by calling the sensing and the actuating functions at small fixed intervals. The self-position estimation of the Z-Quad is very much needed. It is required especially in the real time for on-board and autonomous hovering. These functions are difficult to be run on the Linux System. Here the Baremetal system plays a vital role. In this system CPU1 does two main functions. The first one is to call a function periodically and the second is the loop function.

6.3 Triple Timer Counter (TTC): The TTC contains three independent timers/counters as shown in figure 4.

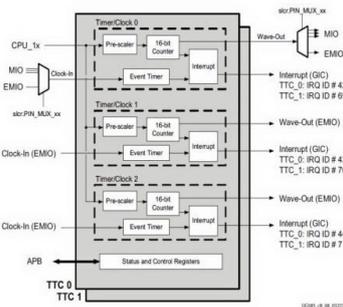


Fig 4: Triple Timer Counter

There are two TTC modules in the PS, for a total of six timers/counters. TTC1 controller can be configured for secure or non-secure mode using the `nic301_addr_region_ctrl_registers.security_apb [ttc1_apb]` register bit. The three timers within a TTC controller have the same security state.

Each of the triple timer counters has:

- Three independent 16-bit prescalers and 16-bit up/down counters.
- Selectable clock input from: Internal PS bus clock (CPU_1x), Internal clock (from PL), External clock (from MIO).
- Three interrupts, one for each counter.
- Interrupt on overflow, at regular interval, or counter matching programmable values.
- Generates waveform output (for example, PWM) through the MIO and to the PL.

Each prescaler module can be independently programmed to use the PS internal bus clock (CPU_1x), or an external clock from the MIO or the PL. For an external clock, SLCR registers determine the exact pinout through the MIO or from the PL. The selected clock is then divided down from /2 to /65536, before being applied to the counter. The counter module can count up or count down, and can be configured to count for a given interval. It also compares three match registers to the counter value, and generate an interrupt if one matches.

The interrupt module combines interrupts of various types: counter interval, counter matches, counter overflow, event timer overflow. Each type can be individually enabled. Each counter module can be independently programmed to operate in either of the following two modes:

6.3.1 Interval mode: The counter increments or decrements continuously between 0 and the value of the Interval register, with the direction of counting determined by the DEC bit of the Counter Control register. An interval interrupt is generated when the counter passes through zero. The corresponding match interrupt is generated when the counter value equals one of the Match registers.

6.3.2 Overflow mode: The counter increments or decrements continuously between 0 and 0xFFFF, with the direction of counting determined by the DEC bit of the Counter Control register. An overflow interrupt is generated when the counter passes through zero. The corresponding match interrupt is generated when the counter value equals one of the Match registers [1].

In the Z-Quad the triple timer counter plays a vital role as it is very much used in actuating the values from the gyro and the accelerometer. The Pitch, Yaw, Throttle and Roll are generated through the triple timer counters in the Z-Quad. In the implementation process the testing through triple timer counters was successful.

6.3.3 Clock Input Option for Counter/Timer

The following shows how AP SoC selects the clock source for TTC0 counter/timer 0:

if `slcr.MIO_PIN_19[6:0]` is 1100000, use MIO pin 19
 else if `slcr.MIO_PIN_31[6:0]` is 1100000, use MIO pin 31
 else if `slcr.MIO_PIN_43[6:0]` is 1100000, use MIO pin 43
 else use EMIO/TTC0CLKI0

TTC0 counter/timer 1 can use only EMIOTTC0CLKI1.
TTC0 counter/timer 2 can use only EMIOTTC0CLKI2.
The following shows how ZynqSoC selects the clock source for TTC1 counter/timer 0:
if slcr.MIO_PIN_17[6:0] is 1100000, use MIO pin 17
else if slcr.MIO_PIN_29[6:0] is 1100000, use MIO pin 29
else if slcr.MIO_PIN_41[6:0] is 1100000, use MIO pin 41
else use EMIOTTC1CLKI0

TTC1 counter/timer 1 can use only EMIOTTC1CLKI1.
TTC1 counter/timer 2 can use only EMIOTTC1CLKI2.

It is important to note when an MIO pin or EMIOTTCxCLKIx is chosen to be the clock source, if the clock stops running, the corresponding Count Value register retains the old value, regardless of the fact that the clock has already stopped [1].

7 Implementation Process

With all the hardware and software components available the building of the Z-Quad based on the Zynq-7000 AP SoC processor was indeed a difficult task. At each and every moment testing had to be done to acquire the desired values. The following are the steps involved in making of the Z-Quad:

Step 1: Interfacing the components to the Zed board. This was a herculean task as the board contains both the FPGA as well as the ARM processor. At first the software through Ubuntu OS had to be configured using the FPGA in the PL section of the Zed board. After the formal Hello World programme is run successfully the following happens as shown in the figure 5.

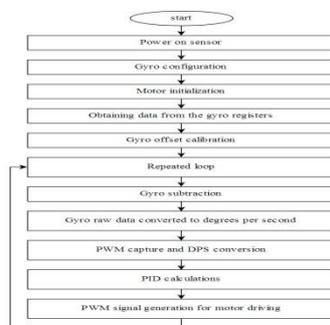


Fig 5: Implementation flow

- a. Generation of PWM signals through the code.
- b. Generation of PWM signals at the required rate i.e. 50Hz frequency and 1-2msec time interval through the code.
- c. Driving the BLDC motors through the PWM signal and testing the speed through the variation of the values given in the code.
- d. In driving the BLDC motors we also test the variation in roll, yaw, throttle and pitch of the motor using the receiver and the transmitter hardware in simulation mode.
- e. Now the coding is done by using the triple timer counter of the Zed board so as to drive the four BLDC motors. Two motors in the clockwise direction and the other two in the anti-clockwise direction.
- f. It is the code developed using the triple timer counter the speeds of the motors are altered and accordingly the flying motion of the Z-Quad changes. A lot of testing is done over here to check the proper functioning of the motors.
- g. The Gyro and the Accelerometer hardware are configured and interfaced to the board using the embedded C coding. The gyro and the accelerometer give the position and the axis for the Z-Quad. It is here the roll, yaw, throttle and pitch of the Z-Quad is actually tested. Here we use I2C communication protocol.
- h. The RC receiver decoding is done using the embedded C coding.
- i. The stabilization the Z-Quad is achieved using the PID (Proportional, integral derivative) algorithm. It is a code used for finding errors especially the differences between Gyro and RC receiver values. The values of both old and new are added and averaged from time to time. A lot of testing is done in this stage.
- j. There is also a need for complimentary filtering for removing errors in the gyro.
- k. The stage is set for Z-Quad to fly. In the test flights a lot of crashes took place and we had to replace the components especially the propellers and sometimes the motors gave in too.
- l. After many successful flight operations the other components are added.
- m. The camera is added so as to give us the video footage of the area under consideration.
- n. The camera is interfaced to the control unit of the ground station. This helps a lot in the Precision Agriculture. The camera could also be a thermal camera that gives us the picture of the entire crop under surveillance.

8 Experimental Results

In our experimental set up we had the following results. After testing all the implementation procedures the Z-Quad is ready to fly. We had to go to a playground in order to experiment the prototype. At first trimming is done so as to stabilize the Z-Quad in its flight. The takeoff was smooth. The experimental results matched the tested results. The flight time was

for 8-10 minutes. For the video coverage results the following resulted. The Cortex-A9 processors executed the ARMv7-A instruction set. The high-performance scalar floating-point computation single instruction multiple data (SIMD) Neon Media Processing Engine with which it is equipped with, is suitable for many applications [10][12]. The image processing algorithms are executed at a very high rate because of the advanced SIMD instructions. The performance is accelerated because of the dual ARM and Neon.



Fig 6: Interfacing of MPU 6050 sensor

The Neon has special processing engine registers. The most significant characteristic of its instruction set is its unique parallel mechanism. It has two input registers Q_A and Q_B . These two input registers each of which contain a set of N individual input vectors [13]. A single defined operation is performed between the N sets of input vectors to produce a corresponding set of output vectors which are written to the output register Q_C . The routes are independent of each other. These can produce results at the same time with several different sets of inputs [10]. Each Neon MPE register loads 128 bit data directly from the DDR through the AXI bus. Then the data is processed and finally it is stored. All operations are performed through programming in the C language thus achieving the optimal processing efficiency.

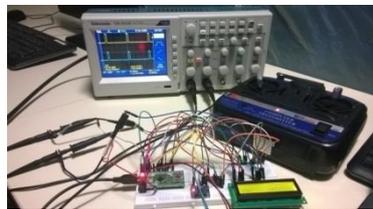


Fig 7: PWM signal generation using Triple Timer Counter

In order to improve the efficiency of system development, the Intel OpenCV library is used. The FPGA logic fabric permits a high-speed, fully parallel version of the coprocessor to be implemented. It is a hand-coded RTL design. The accelerators are generated to take a C description of the algorithm using Vivado high level synthesis (HLS) tools. The Vivado HLS tools generate Gauss filter IP and are thus attached on the AXI bus. ARM0 is given the object tracking and calculation of Kalman filter as the amount of calculation is very small. HDMI exports the results of detection and tracking. The Xilinx Zed board has 512Mb RAM attached and Dual ARM Cortex-A9 hard-core processor system (PS) running on 667 MHz. The logic (PL) IP is implemented with 100 MHz clock frequency. The Image data is sent from PC to the SD card memory through Enet. The size of each frame is 1137x686. The time performance is 768 milliseconds per frame, which includes data flow, IP hardware execution and Neon acceleration. The algorithm is implemented through software.



Fig 8: Gyro Offset Values Fig 9: Gyro Subtraction Values Fig 10: Gyro DPS Values Fig 11: Receiver PWM captured signals and their DPS values.

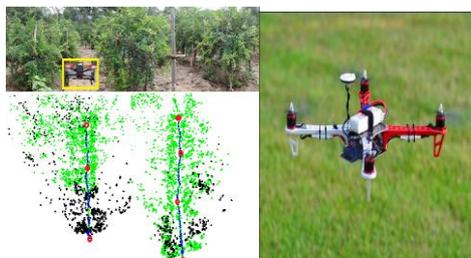


Fig 12: Estimating the Crop. Fig 13: Z-Quad in Surveillance mode.

9 Conclusion & Future Work

In this paper, I have given the architecture of the prototype Z-Quad with all its specifications, applications, hardware and software components. Every step in the implementation process took a lot of time. The prototype is ready to fly but given

to the extreme heat conditions in my environment there are certain obstacles in the performance of the flight. Besides these constraints the cost for the purchase of the standard components has been on the rise. Thanks to the Centre for Development of Advanced Computing that has given me a platform to do this work. The main advantage in using Zed board in this particular prototype is the object detection and tracking system that combines hardware and software co-design which is implemented on Xilinx's ZedBoard. It is very much necessary in the Precision Agriculture. This has a lot of advantages over other platforms in terms of the speed, power consumption, development difficulty and cost. The prototype is already flying but is yet to be tested in the Agriculture land with prior permissions from the authority.

The Future scope of this work relies very much on increasing the flight time of the Z-Quad. The power consumed by the Z-Quad has to be charged in its flight time itself. Interfacing solar panels to recharge the battery on the Z-Quad is the only solution available to increase the flight time of the Z-Quad. All said and done many more features like the Wi-Fi, remote sensors and hazardous mission possible features can be implemented. With all these features the weight increases and accordingly the capacity of the BLDC motors also increases. All this opens up a big scope for the future work on the Z-Quad.

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EFFECTIVE TEACHING AIDS TO IMPROVISE THE QUALITY OF MATHEMATICS EDUCATION

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Abstract: Mathematics is the fundamental science and an indispensable subject of study which forms the basis of all sciences. To recognize the computerized world and match with the fastest growing Information and Communication Technology, developed smart cities working through Internet of Things, Mathematical knowledge among students is essential. The understanding of Mathematics depends on the study of substance, relation between structured and unstructured objects, reasoning, state of Mathematical propositions, rational thinking and a firm inclination towards solving the problems. However, in spite of knowing the importance of the subject the overall performance of the students in Mathematics is unsatisfactory and majority of students in science discipline lack quality education. The main focus of this research is to find the existing barriers in teaching-learning process of Mathematics at the undergraduate level. The areas of study have been Abstract Algebra and Real Analysis of B. Sc II Year students at 5 nearby colleges in Mehdiapatnam and the study adopted the descriptive survey using simple frequency and percentages in analyzing data. The research questions have been prepared to reveal the major problems in teaching-learning process of Abstract Algebra, Real Analysis and to propose possible solutions to overcome the barriers. The process involved collecting data from teacher and students involved in the teaching and learning of Abstract Algebra, Real Analysis. The problems faced have been multifaceted ranging from pedagogical, social, economic, administrative, curricular design, Government policies pertaining to the overall teaching learning process. Based on these findings the recommendations have been: (1) Bridge Course to be introduced to have strong basic foundation in the subject at B. Sc I year level (2) Teacher-Student ratio have to be taken into consideration for a better hold and success rate (3) **Innovative techniques/ Modeling methods to be introduced** (4) Teachers to be motivated to attend conferences/Seminars/Training Programs to keep abreast with the current happenings in society and in turn impart their knowledge to students. The research contributes in the endeavor of identifying the major obstacles in teaching and learning of Abstract Algebra, Real Analysis and thereby working towards a possible solution.

Keywords: Innovative methods, Teaching –Learning, Mathematical Knowledge, Data Collection, Quality Education, Abstract Algebra, Real Analysis, Data Analyzing

Introduction:-

Mathematics is essential in our day to day lives and has its impact felt in the field of Science and Technology, Medicine, Economy, Architecture, Business Public decision making etc. Mathematics career helps in personality development and to be better informed citizen. The study of Mathematics equips students with immense knowledge pertaining to reasoning, creativity, logical skills and sharpens their mind to a great extent helping them to be successful in their future life.

In most of the colleges Mathematics teaching follows lecture method and teaching is not student centered. To create interest and realize the importance of the subject among students, certain mathematical skills have to be developed. The Numerical ability, Comprehensive ability and recall abilities must be developed through innovative practices of teaching. Mathematical aids such as ICT enabled teaching have to be introduced into the curriculum for an improvised teaching process.

Real analysis is a fascinating and elegant area of Mathematics dealing with Real numbers and real valued functions of a Real variable consisting of results and theorems essential for the higher level of Mathematics. Real Analysis knowledge forms the basis in understanding various aspects of the subject at the post graduate level and is an important tool to assist students pursuing their research in the field of Mathematics. Students at Undergraduate level come from various backgrounds which is an important issue to be considered as the subject is abstract and imaginary. The learner needs to have a very good foundation with regard to the basics like sets and relations, functions, limits etc. As definitions, Theorems form the basis of Real Analysis in comparison with the applications; it becomes a challenging task for the students and educators to deal with the subject. Such is the case with Abstract Algebra which is the study of Abstract Structures like Groups, Rings, Vector Spaces, Fields, Modules etc. As the name indicates, Algebra is an abstract study of Mathematics dealing with proofs and definitions making it difficult for the students to understand and grasp the concepts. Therefore, as an educator/teacher of Mathematics, the difficulties faced by students in learning Abstract Algebra and Real Analysis were analyzed by conducting a detailed sample study on the students, developing a questionnaire and the results were tabulated. Depending on the results a deep study has been taken up to develop an instructional strategy and improvise their skills to be a better Mathematician

Purpose of the Study:

The study explored the factors that contribute to the difficulties in teaching and learning of approximation and scheme up strategies that could remedy the difficulties faced by the target group.

Methodology:

Research design

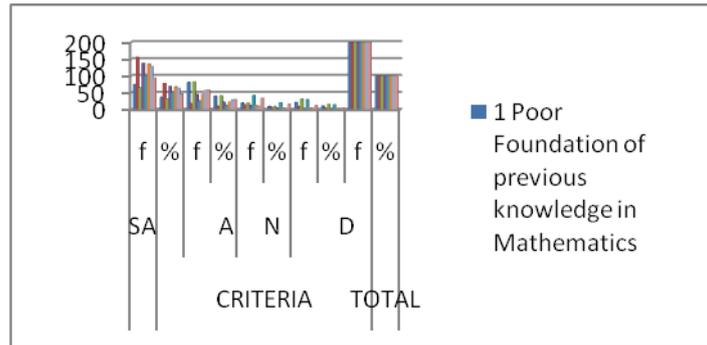
The research adopted the descriptive survey method. Data was collected through questionnaires to establish the views of lecturers and students. This survey helped the teacher/ educator to elicit the view and attitudes of teacher / students about the difficulty levels of learning/ teaching Real Analysis/Abstract Algebra.

Sample size and Sample distribution

Sample size refers to the number of participants selected from 4-5 nearby colleges. The sample size of 200 participants includes students of various back grounds i.e. intelligent /less intelligent/Hard working /weak students. The questionnaire was well structured/framed to provide the needed information required for the survey.

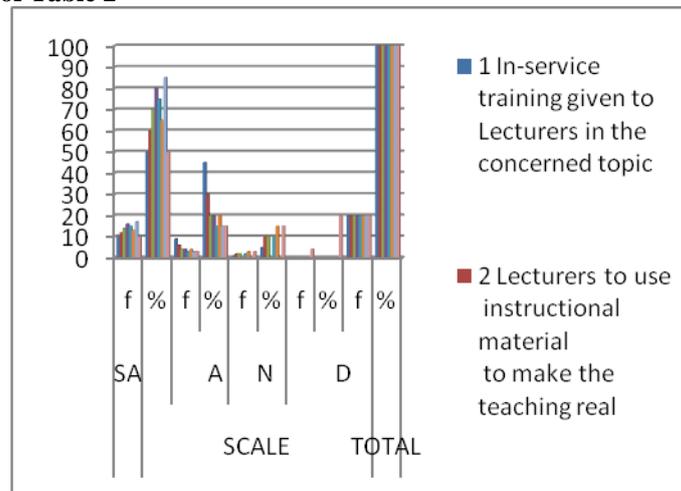
SA-Strongly Agree, A-Agree, N-Neutral, D-Disagree

Graphical Representation of Table 1



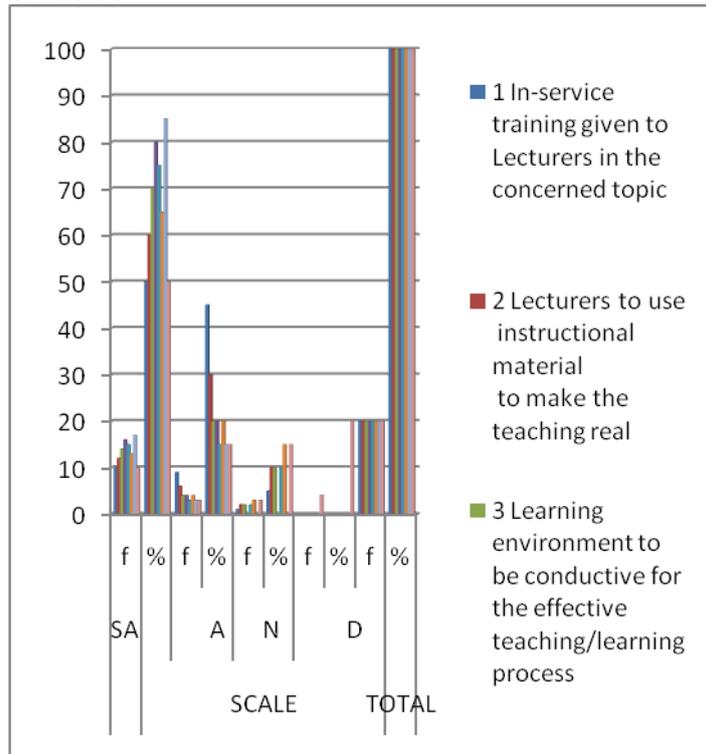
SA-Strongly Agree, A-Agree, N-Neutral, D-Disagree

Graphical Representation of Table 2

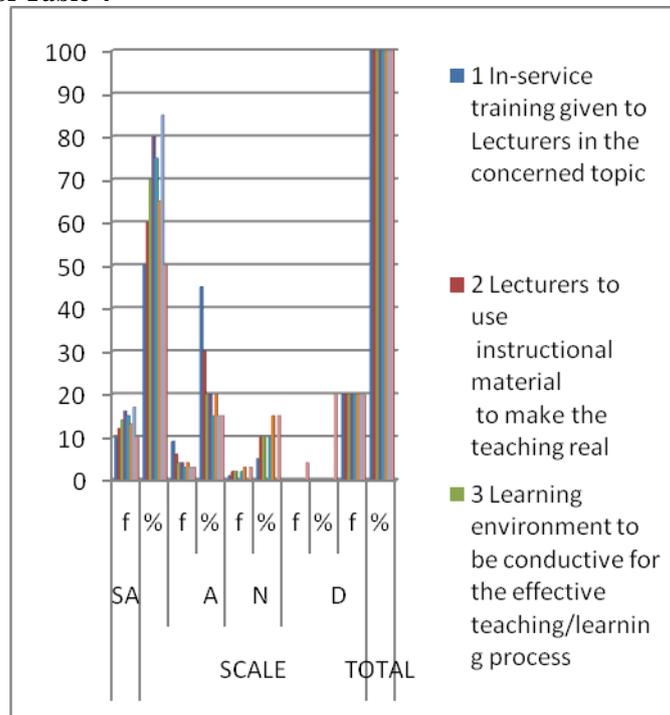


It is of importance to note that the lecturers and students agree strongly to the fact that the poor foundation of students in Mathematics, overcrowded classes, negative attitude towards the subject and lack of instructional aids are the major problems of teaching and learning of approximation as revealed in the tables.

Strategies adopted to enhance better teaching and learning process:
Graphical Representation of Table 3



SA-Strongly Agree, A-Agree, N-Neutral, D-Disagree
Graphical Representation of Table 4



The responses on table 3 and table 4 shows that the lecturers and students should accept all the conditions in the table for better enhancement of teaching and learning process in the classroom.

Data analysis

The quantitative data obtained through the lecturers and students questionnaire were analyzed using percentages, charts and frequency tables. After the data analysis, the following findings were summarized from teachers and student point of view.

- Students have poor foundation in Mathematics.
- Students try to memorize without understanding the logic and mathematical concept involved.
- Lectures are overloaded and class room strength is high.
- Teaching learning environment is not conducive.
- Based on the finding, the researcher is putting a technology for improvising the skills of students.

Methodology to be adopted

ICT enabled teaching for Real Analysis/ Abstract Algebra is the vital tool to enhance teaching/ learning phenomena. This requires the teacher/Educator to open a web page/or use college website / YouTube for teaching their respective subject.

In this webpage, the course teacher will post

- Course material, Syllabus, homework, assignments etc
- Student's assignment /student projects will be posted.
- Students can post their answers to teachers by sending a mail or by online system
- Students can develop a glossary which can be used during the examinations.

If the student does not have an access to the computer then handouts would be provided pertaining to the material posted on the web.

A relational survey on the usage of webpage in comparison to handouts and traditional teaching system was taken. At the end of the survey there were major conclusions drawn. The following objectives are to be introduced by the colleges:

- Encourage collaborative learning/teaching environment
- Develop Mathematical tools for the easy communication of students
- Expose students to collaborative technologies and collaborative projects based on their
- Assignments.
- Students to be divided into smaller groups and given course work for the better implementation.

Classroom Technology

The community of educators has increased the use of technology which enables the teacher to connect with their students and the outside world and get familiar with the current trends and happenings in the field of Mathematics. Regular participation in Conferences/ Workshops/ FDPs /Training programs enables them to impart their knowledge to the student fraternity.

Projects /Assignments

Students will be given assignment problems to increase their skills and knowledge. The problems are framed in such a way where students can analyze, condense their thoughts and interpret their views in Mathematical language. This requires the teacher/ educator to learn more and keep themselves abreast with current happenings which is a time consuming process. This makes the student-teacher community to move from abstract learning to experimental approach.

Conclusions and Discussions:

- The students were very appreciative, enthusiastic and seemed encouragingly satisfied to implement the above approach to improvise their logical, reasoning skills and to develop creative thinking.
- Students were well prepared for the Mathematical typesetting programs.
- Initially students showed less interest in the participation but with proper encouragement of the educator they were all set to take up the challenges.
- The Mathematical typesetting software creates an exposure to students with regard to their concentration and interest in the subject.
- Students would be able to work on Minor research Projects resulting in a voyage of discovery

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NEW APPROACH TO MATRIX CRYPTOGRAPHY

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Abstract: Encryption and Decryption of data using modular arithmetic is widely used in the field of cryptography. In this paper we have decrypted a coded message using invertible matrix by multiple encryption where the private key is the determinant of the residue matrix where all the elements are in Z_n .

Key words: Modular Arithmetic, Congruence, Invertible Matrix, Adjoint Matrix, Residue matrix, Determinant, Congruence modulo operator (mod).

1. INTRODUCTION

Data Encryption means hidden/coded information that a layperson can't understand unless he/she breaks the encryption or restores the original information. An original message is called plaintext while the coded one is called crypto text. When the message is encrypted, you need to have a so-called key, a usually quite complicated parameter that you can use to change the encryption. If the encrypting procedure remains unchanged for a long time, the probability of breaking the encryption will in practice increase substantially. Naturally different users need to have their own keys, too. The receiver of the message decrypts it, for which he/she needs to have his/her own key. Both the encrypting key and decrypting key are very valuable for an eavesdropper, using the encrypting key he/she can send encrypted fake messages and using the decrypting key he/she can decrypt messages not meant to him/her. In symmetric cryptosystems both the encrypting key and the decrypting key are usually the same. An encrypting procedure can encrypt a continuous stream of symbols (stream encryption) or divide it into blocks (block encryption). Sometimes in block encryption the sizes of blocks can vary, but a certain maximum size of block must not be exceeded. However, usually blocks are of the same size. In what follows we shall only examine block encryption, in which case it's sufficient to consider encrypting and decrypting of an arbitrary message block, and one arbitrary message block may be considered as the plaintext and its encrypted version as the crypto text.

Residue Matrices

Cryptography uses residue matrices i.e matrices in all elements are in Z_n . All operations on residue matrices are performed the same as for the integer matrices except that the operations are done in modular arithmetic. One interesting result is that a residue matrix has a multiplicative inverse if the determinant of the matrix has a multiplicative inverse in Z_n . In other words, a residue matrix has a multiplicative inverse if $\gcd(\det(\mathbf{A}), n) = 1$.

Congruence: Two matrices are congruent modulo n , written as $\mathbf{A} \equiv \mathbf{B} \pmod{n}$, if they have the same number of rows and columns and all corresponding elements are congruent modulo n . In other words, $\mathbf{A} \equiv \mathbf{B} \pmod{n}$ if $a_{ij} \equiv b_{ij} \pmod{n}$ for all i 's and j 's. Cryptography often involves solving an equation or a set of equations of one or more variables with coefficient in Z_n .

2. Numerical Representation of 40-letter Assignments (letter, number or punctuation marks)

A=0	K=10	U=20	1=30
B=1	L=11	V=21	2=31
C=2	M=12	W=22	3=32
D=3	N=13	X=23	4=33
E=4	O=14	Y=24	5=34
F=5	P=15	Z=25	6=35
G=6	Q=16	,=26	7=36
H=7	R=17	.=27	8=37
I=8	S=18	?=28	9=38
J=9	T=19	0=29	!=39

3. Encryption and Decryption

The original plain text is ABCDEFGHA. Now it is arranged in 3*3 matrix by assigning numerical values to each letter column wise.

$$\mathbf{X} = \begin{pmatrix} 0 & 3 & 6 \\ 1 & 4 & 7 \\ 2 & 5 & 0 \end{pmatrix}$$

$$Y = X + 3 \pmod{40} = \begin{pmatrix} 3 & 6 & 9 \\ 4 & 7 & 10 \\ 5 & 8 & 3 \end{pmatrix}$$

I. ENCRYPTED FORM:

$$A = \text{Adj } Y = \text{Transpose of } \begin{pmatrix} -59 & 38 & -3 \\ 54 & -36 & 6 \\ -3 & 6 & 3 \end{pmatrix}$$

$$A = \text{Adj } Y = \begin{pmatrix} -59 & 54 & -3 \\ 38 & -36 & 6 \\ -3 & 6 & 3 \end{pmatrix}$$

The coded message is -59 38 -3 54 -36 6 -3 6 3

II. Key As Non-Singular Matrix Where $|Y| \neq 0$

The key can be shared by giving the $\det Y$ as a private key .

$$\text{Key}(k) = |Y| = 5(-3) + 8(6) + 3(3) = 24 \neq 0$$

III. DECRYPTION:

$$\text{Inverse of } Y: \text{ Let } B = \text{Adj } Y / |Y| = A/k = (1/24) * \begin{pmatrix} -59 & 54 & -3 \\ 38 & -36 & 6 \\ -3 & 6 & 3 \end{pmatrix}$$

$$B = \begin{pmatrix} -59/24 & 54/24 & -3/24 \\ 38/24 & -36/24 & 6/24 \\ -3/24 & 6/24 & 3/24 \end{pmatrix}$$

Inverse of B: $B^{-1} = \text{Adj } (B) / |B|$

$$\text{Adj } B = \begin{pmatrix} 3 & 6 & 9 \\ 4 & 7 & 10 \\ 5 & 8 & 3 \end{pmatrix}; |B| = (-59/24) * 3 + (54/24) * 4 + (-3/24) * 5 = -7.375 + 9 - 0.625 = 1$$

$$B^{-1} = \text{Adj } (B) / |B| = (1/1) * \begin{pmatrix} 3 & 6 & 9 \\ 4 & 7 & 10 \\ 5 & 8 & 3 \end{pmatrix}$$

IV. DECRYPTED TEXT:

$$X = B^{-1} + 37 \pmod{40} = \begin{pmatrix} 3 & 6 & 9 \\ 4 & 7 & 10 \\ 5 & 8 & 3 \end{pmatrix} + 37 \pmod{40}$$

$$X = \begin{pmatrix} 0 & 3 & 6 \\ 1 & 4 & 7 \\ 2 & 5 & 0 \end{pmatrix}$$

ORIGINAL TEXT: ABCDEFGHA

4.PROGRAM FOR DECRYPTION

```

/*program for decryption*/
#include<iostream.h>
#include<conio.h>
#include<math.h>
void adj(float x[3][3],int k)
{ char d[3][3],M[40];
int i,j,m,inv1[3][3];
float inv[3][3];
inv[0][0]=float(k)*((x[1][1]*x[2][2])-(x[2][1]*x[1][2]));
cout<<inv[0][0]<<"\n";
inv[0][1]=float(k)*(-1)*((x[0][1]*x[2][2])-(x[2][1]*x[0][2]));
cout<<inv[0][1]<<"\n";
inv[0][2]=float(k)*((x[0][1]*x[1][2])-(x[1][1]*x[0][2]));
cout<<inv[0][2]<<"\n";
inv[1][0]=float(k)*(-1)*((x[1][0]*x[2][2])-(x[2][0]*x[1][2]));
cout<<inv[1][0]<<"\n";
inv[1][1]=float(k)*((x[0][0]*x[2][2])-(x[2][0]*x[0][2]));
cout<<inv[1][1]<<"\n";
inv[1][2]=float(k)*(-1)*((x[0][0]*x[1][2])-(x[1][0]*x[0][2]));
cout<<inv[1][2]<<"\n";
inv[2][0]=float(k)*((x[1][0]*x[2][1])-(x[1][1]*x[2][0]));
cout<<inv[2][0]<<"\n";
inv[2][1]=float(k)*(-1)*((x[0][0]*x[2][1])-(x[2][0]*x[0][1]));
cout<<inv[2][1]<<"\n";
inv[2][2]=float(k)*((x[0][0]*x[1][1])-(x[1][0]*x[0][1]));
cout<<inv[2][2]<<"\n";
for(i=0;i<3;i++)
{ for(j=0;j<3;j++)
{ if((inv[i][j]-int(inv[i][j]))>=0.5)
inv1[i][j]=(int(inv[i][j])+38)%40;
else
inv1[i][j]=(int(inv[i][j])+37)%40;
cout<<"\n"<<inv1[i][j];
} }
for(i=0;i<40;i++)
{ int l=65;
if(i<=25)
{ M[i]=char(l+i);
}
if(i==26)
M[i]=char(48);
if(i==27)
M[i]=char(49);
if(i==28)
M[i]=char(50);
if(i==29)
M[i]=char(51);
if(i==30)
M[i]=char(52);
if(i==31)
M[i]=char(53);
if(i==32)
M[i]=char(54);
if(i==33)
M[i]=char(55);
if(i==34)

```

```
M[i]=char(56);
if(i==35)
M[i]=char(57);
if(i==36)
M[i]=' ';
if(i==37)
M[i]='.';
if(i==38)
M[i]='?';
if(i==39)
M[i]='!';
}
for(i=0;i<3;i++)
{for(j=0;j<3;j++)
{for(m=0;m<40;m++)
{if(inv1[i][j]==m)
d[i][j]=M[m];
}}}
cout<<"the decrypted code is:";
for(i=0;i<3;i++)
{for(j=0;j<3;j++)
{cout<<d[j][i];
}}}
void main()
{int i,j,k;
float b[3][3],a[3][3];
clrscr();
cout<<"Enter the encrypted code";
for(i=0;i<3;i++)
for(j=0;j<3;j++)
cin>>a[j][i];
for(i=0;i<3;i++)
for(j=0;j<3;j++)
cout<<a[i][j]<<"\t";
cout<<"enter the key";
cin>>k;
for(i=0;i<3;i++)
{for(j=0;j<3;j++)
{b[i][j]=a[i][j]/k;
cout<<"\n"<<b[i][j]<<"\t";
}}
adj(b,k);
getch();
}
```

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DETERMINATION OF MATERNAL EFFECTS ON QPM MAIZE INBREDS LINES

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ABSTRACT

Five UQPM inbreds were crossed as female parent to three testers as male parent to generate 15 F1 direct crosses and reciprocal crosses were made to generate another 15 F1 crosses. Totally 39 genotypes including hybrids along with their parents and check (COH (M) 5) were evaluated in randomized block design to estimate the maternal effects in QPM through SCA, and GCA analysis. In this study, we revealed that hybrids of female parent UQPM 15 and UQPM 11 possess higher grain tryptophan and grain lysine where as in reciprocal crosses i.e. when UQPM 15 and UQPM 11 used as male, quality characters do not show improvement to the level to which they are used as female parent, indicating that quality protein content depended on maternal parent. Also found to have desirable gca effects for the biometric traits.

Keywords: UQPM, SCA, GCA, Maternal effects, Lysine and inbreds

INTRODUCTION

Maize is important food crop next to wheat and rice. Maize is used as both food and fodder crop and also a poor man's nutritive cereal. Maize kernel contains 80 % carbohydrates, 10% protein, 4.5% oil, 3.5% fiber and 2% minerals (Jugenheimer, 1976). It is a good source of calcium and phosphorous. But maize is deficient for two essential amino acids such as lysine and tryptophan. The breakthrough in maize production is obtained after the discovery of opaque 2 mutant maize which alters the amino acid composition and enhances the grain tryptophan and lysine content in maize (Mertz et al., 1964). It promotes evolution of new quality protein maize composites such as rattna, sakthi and protina. Later on QPM production was affected due to its soft endosperm texture. Intensive breeding efforts had made in CIMMYT to release the hard texture endosperm QPM for commercial cultivation. The endosperm modification in QPM is quantitatively inherited and there is increased synthesis of zein (Vassal et al., 1993). In this study we evaluated the 30 hybrids derived from both direct and reciprocal crosses along with 8 parents and check (COH (M) 5) to understand the maternal effects of Quality Protein Maize (UQPM) inbreds.

MATERIALS & METHODS

Eight inbreds listed in Table 1 obtained from Allahabad Agriculture University, and few inbreds from NBPGR- New Delhi. The parents numbered 1 to 5 (Table 1) were used as female parents (Lines) and 6 to 8 were used as male parent (Tester). Five lines and three testers were crossed in L x T fashion, to incorporate QPM character. In another set the parent numbered 1 to 5 were used as male parent (tester) and 6 to 8 as female parent (lines) i.e. three lines and five testers were crossed in L x T fashion as reciprocal combination to incorporate QPM character.

The parental seeds were raised at Loyola academy agriculture, Departmental student farm, during kharif season 2017, in three staggered sowing to get synchronization of flowering and for continuous availability of pollen. Tassel bag method was used for hybridization. Thirty hybrids obtained from Line X Tester crossing fashion using five lines and three testers as direct crosses as well as reciprocal crosses. All the hybrids were evaluated along with eight parents and with the normal commercial hybrid COH (M) 5 during Kharif. Their seeds were raised in randomized block design with three replications and 60 x 45 cm spacing was adopted. Each entry was sown in two rows of 4m length. Five random plants from each entry per replication were tagged and the observation recorded for fifteen characters viz., days to silking, plant height, ear height, cob length, cob girth, number of kernels per row, number of grains per cob, 100 grain weight, grain length, grain breadth, grain width, grain yield per plant, crude protein, grain tryptophan, and grain lysine. Grain protein percentage was estimated by Microkjeldhal method (Humphries, 1956). Tryptophan and Lysine in grain sample was estimated by calorimetric method (Mertz et al., 1975, Theymoli Balsubramanian and Sadasivam., 1987). Tryptophan in the grain sample was calculated using the formula, Grain tryptophan or lysine % = Value from graph in $\mu\text{g} \times 0.096(\text{g}/16 \text{ g N})$. The data on the hybrids and parents recorded were subjected to L x T analysis described by Kempthorne (1957). The assumption of null hypothesis was tested for differences among the genotypes as detailed by Panse and Sukhatme (1964). The mean squares due to different sources of variation as well as their genetic expectations were estimated. ANOVA used to estimate GCA and SCA effects.

Table 1 inbreds list

S.No	Inbreds	Grain type	Source
1	UQPM-5	Yellow-flint	NBPGR
2	UQPM-11	Yellow -dent	NPBGR
3	UQPM-12	Yellow-flint	SHUATS
4	UQPM-13	Yellow-flint	SHUATS

5	UQPM-15	Yellow-flint	SHUATS
6	UQPM-9	Yellow-flint	NBPGR
7	UQPM-10	Yellow -dent	SHUATS
8	UQPM-4	Yellow -dent	NBPGR

RESULTS & DISCUSSION

The eight parents of the study were deliberately chosen based on their variability for grain characters. All the parents possessed yellow grain. Three parents viz., UQPM 11, UQPM 10, and UQPM 14 had dent grain texture and other five viz., UQPM 5, UQPM 12, UQPM 13, UQPM 15, and UQPM 9 had flint grain texture. Fifteen hybrids were generated from five lines viz., UQPM-5, UQPM -11, UQPM-12, UQPM-13, UQPM-15 and three testers UQPM-9, UQPM-10, and UQPM-14. In another set fifteen more hybrids generated in a reciprocal manner that is using lines as testers and tester as lines, here the lines are UQPM-9, UQPM-10, and UQPM-14 and testers are UQPM – 5, UQPM -11, UQPM-12, UQPM-13, and UQPM-15. Therefore, totally thirty hybrids derived from both direct and reciprocal crosses were evaluated for fifteen characters viz., days to silking, plant height, ear height, cob length, cob girth, number of kernels per row, number of grains per cob, 100 grain weight, grain length, grain breadth, grain width, grain yield per plant, crude protein, grain tryptophan, and grain lysine.

Evaluation of Parents

In the present study, desirable mean value and gca effect were revealed by the parent UQPM11 for two characters in direct crosses viz., grain breadth, grain width and grain protein whereas in reciprocal crosses it was for three characters viz., number of grains per cob, grain tryptophan and grain lysine; UQPM 15 for plant height, grain protein, grain tryptophan and grain lysine in direct and for plant height, ear height and grain protein in reciprocal crosses; UQPM 9 for two characters viz., plant height and grain protein in both direct as well reciprocal; UQPM 10 for 100 grain weight in reciprocal crosses; UQPM 14 for five character in direct crosses viz., cob girth, grain length, grain breadth, grain width and grain yield whereas in reciprocal crosses it was grain length, grain breadth, grain width and grain yield. Hence, these parents can definitely be used for improvement of the respective traits in hybridisation programme. Analysis of variances for combining ability of the both crosses is given in Table 2a and 2b. Also the Magnitude of GCA and SCA variances and proportional contribution of Lines, Testers, and Line X Testers to total variances for various characters for both direct crosses and reciprocal crosses are given in Table 3a and 3b.

Evaluation of hybrids

Specific combining ability (sca) i.e., the deviation from the performance predicted based on general combining ability of parents (Allard, 1960) was the third important criterion for evaluation of hybrids. Among the hybrids identified with significant and desirable sca effect for different characters, it was observed that hybrids with significant and desirable sca effects were from the parents of differential combinations i.e., hybrids with significant and desirable sca effects were from high x high, high x low, low x high and low x low gca combinations. Similar results of desirable sca have been reported by many workers for yield and its component traits (Debnath and Sarkar, 1987; Mathur et al., 1998; Kumar, et al., 1998; Kara, 2001; Kalla et al., 2001; Dodiya and Joshi, 2003). Yield is the cumulative function of all the components and is the final goal of a maize breeder, for which UQPM13XUQPM14, UQPM5XUQPM9, UQPM15XUQPM10 and UQPM12XUQPM10 were the best under all three evaluation criteria and topped among the hybrids. The hybrid UQPM13XUQPM14 for number of kernels per row, number of grains per cob and 100 grain weight; UQPM5XUQPM9 had qualified for number of grains per cob and 100 grain weight; UQPM15XUQPM10 and UQPM12XUQPM10 for grains per cob and 100 grain weight respectively. For grain yield, in all four hybrids one of the parents had low gca effects (UQPM10) and other hand high gca effects (UQPM14 and UQPM12) and other parents had moderate gca effect (UQPM13, UQPM5, UQPM9 and UQPM15). For effective selection, a hybrid should be with high per se, standard heterosis and sca effect. In addition, the hybrid should have both the parents as good combiners and at least one parent as a good combiner. Richharia and Singh (1983) also opined that a hybrid should have at least one parent as a good combiner. Hence, going by the above statement, it is suggested that the four hybrids UQPM13XUQPM14, UQPM5XUQPM9, UQPM15XUQPM10 and UQPM12XUQPM10 could be exploited as promising hybrids for grain yield after confirmative testing. Maximum hybrids were found to possess higher grain tryptophan and grain lysine when UQPM 5, UQPM11 and UQPM 15 was used as female parent and also found to have desirable gca effects for the above traits. When UQPM 15 and UQPM 11 (desirable donor parents for improvement of grain protein, grain lysine and grain tryptophan) were used as female parents in the study, hybrids were found to possess higher grain tryptophan and grain lysine where as in reciprocal crosses i.e. when UQPM 15 and UQPM 11 used as male, quality characters do not show improvement to the level to which they are used as female parent, indicating that quality protein content depended on maternal parent. such an observation was also made by Popova (1980). Further, a critical analysis of parental combinations and hybrid performance showed that most of the good hybrids for different traits were from low x low parental combinations. This may be due to the fact that the performance of parents which had diminished due to inbreeding depression resulted from continuous selfing, results also indicate that the high performance of hybrids is not limited to high order of parents, but it could be also produced with all possible combinations of high x low and low x low parental status. Subba Rao and Aruna (1997) and Badhe and Patil (1997) observed similar results in their studies.

CONCLUSION

One of the objectives of the present study is to look for high yielding hybrids with desirable quality traits in terms of protein, grain tryptophan and grain lysine content. From the study, it was observed that the hybrid UQPM15XUQPM10 need worth mentioning as it possessed high per se, standard heterosis and sca effect for grain yield and grain protein. It also possessed high standard heterosis and sca effect for grain tryptophan and grain lysine. Besides, the six hybrids UQPM14XUQPM11 registered high per se, standard heterosis and sca effect for grain protein, grain tryptophan, grain lysine and grain yield. UQPM9XUQPM12 and UQPM10XUQPM15 registered high per se, standard heterosis and sca effect for grain protein, grain tryptophan and grain lysine; UQPM11XUQPM10, and UQPM5XUQPM14, registered high per se, standard heterosis and sca effect for grain tryptophan and grain lysine. Development of breeding materials is one another option for a breeder to effectively utilize the developed genetic materials. In this context, thenine promising hybrids identified viz., UQPM13XUQPM14, UQPM5XUQPM9, UQPM15XUQPM10, UQPM12XUQPM10, UQPM14XUQPM11, UQPM9XUQPM12, UQPM10XUQPM15, UQPM11XUQPM10, and UQPM5XUQPM14 may be utilized in the multiple crosses and development of panmictic populations in order to isolate desirable segregants combining yield and quality.

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ENERGY MANAGEMENT AND AUDIT

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Abstract: The main significance of the this paper is "The strategy of adjusting and optimizing energy, using systems and procedures so as to reduce energy requirements per unit of output while holding constant or reducing total Costs of producing the output from these systems". The objective of Energy Management is to achieve and maintain optimum energy procurement and utilization, throughout the organization. To minimize energy costs / waste without affecting production & quality. To minimize environmental effects. I am applying Quantitative research technique is used for this project. A method is given for determining the energy losses in power system elements (transmission lines, transformers, etc.). The method is based on knowing typical daily load curves (DLCs) of different kinds of load. The idea of the proposed method is to use statistical mathematics to organize all the data that are in the load curves in order to obtain only those few quantities that are needed to calculate energy losses. These quantities, called statistical moments, include all the useful information about the DLC. The method gives accurate results compared with direct computation and is several times faster than any other existing simulation or direct technique. The benefit of this project is effective way of utilization of energy and also Identify the possible solutions for optimization of energy sources utilizations.

Key Words: optimizing energy, Energy Management, statistical moments, simulation, utilization of energy.

1. INTRODUCTION

The main significance of the this project is "The strategy of adjusting and optimizing energy, using systems and procedures so as to reduce energy requirements per unit of output while holding constant or reducing total Costs of producing the output from these systems". The objective of Energy Management is to achieve and maintain optimum energy procurement and utilization, throughout the organization. To minimize energy costs / waste without affecting production & quality. To minimize environmental effects. I am applying Quantitative reach technique is used for this project. A method is given for determining the energy losses in power system elements (transmission lines, transformers, etc.).

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My study apply to MANJEERA shopping Mall.



1.1. Circuit Breakers:

A **circuit breaker** is an automatically operated electrical switch designed to protect an electrical **circuit** from damage caused by overload or short **circuit**. Its basic function is to detect a fault condition and interrupt current flow.



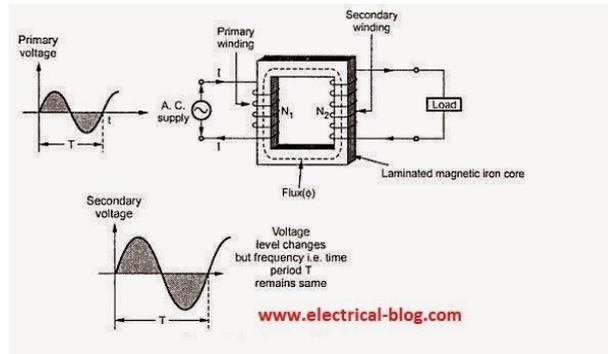
Fig: Circuit Breaker

1.2. Transformer:

The principle of **mutual induction** states that when two coils are inductively coupled and if current in one coil is change uniformly then an e.m.f gets induced in the other coil. This e.m.f. can drive a current, when a closed path is provided to it. The transformer works on the same principle. In its elementary form, it consists of two inductive coils which are

electrically separated but linked through a common magnetic circuit. The two coils have high mutual inductance. The basic transformer is shown in Fig:4.2.1.

One of the two coils is connected to source of alternating voltage. This coil in which electrical energy is fed with the help of source is called **primary winding (P)**. The other winding is connected to load. The electrical energy transformer to this winding is drawn out to the load.



This winding is called **secondary winding (S)**. The primary winding has N_1 number of turns while the secondary winding has N_2 number turns. Symbolically the transformer is indicated as shown in Fig: 2.2

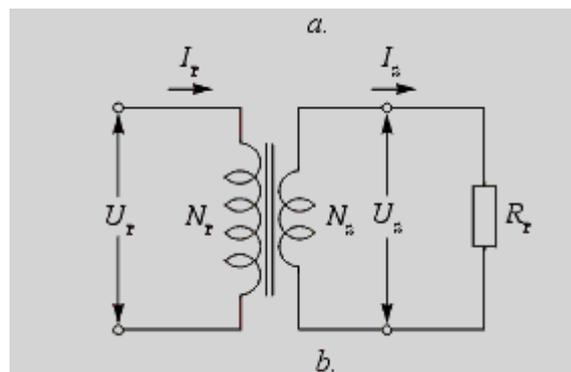


Fig: 2.2. Symbolic representation

When primary winding is excited by an alternating voltage, it circulates an alternating current. This current produces an alternating flux (ϕ) which completes its path through common magnetic core as shown in Fig: 4.2.1. Thus an alternating, flux links with the secondary winding. As the flux is alternating according to Faraday’s law of electromagnetic induction, mutually induced e.m.f. gets developed in the secondary winding. If now load is connected to the secondary winding, this e.m.f. Drives a current through it.

Thus through there is no electrical contact between the two windings, an electrical energy gets transferred from primary to the secondary.

Transformer rating represented by KVA, because Iron loss of transformer dependent on voltage and copper losses are dependent on current.

1.3. Diesel Generators:



Fig: 2.3. Diesel Generators

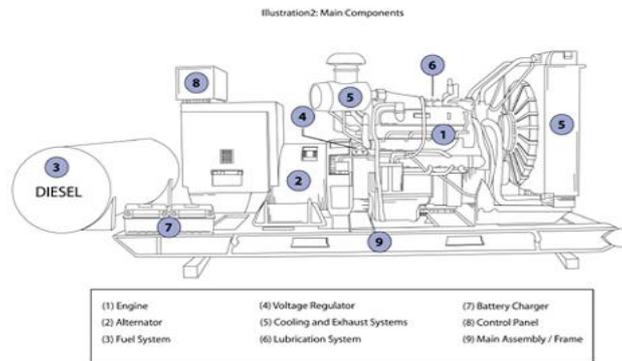
In the Shopping Mall have two Diesel Generators of rating 1500 KVA and 500 KVA. Generators are useful appliances that supply electrical power during a power outage and prevent discontinuity of daily activities or disruption of business operations. Generators are available in different electrical and physical configurations

for use in different applications. In the following sections, we will look at how a generator functions, the main components of a generator, and how a generator operates as a secondary source of electrical power in residential and industrial application.

An electric generator is a device that converts mechanical energy obtained from an external source into electrical energy as the output.

It is important to understand that a generator does not actually ‘create’ electrical energy. Instead, it uses the mechanical energy supplied to it to force the movement of electric charges present in the wire of its windings through an external electric circuit. This flow of electric charges constitutes the output electric current supplied by the generator. This mechanism can be understood by considering the generator to be analogous to a water pump, which causes the flow of water but does not actually ‘create’ the water flowing through it.

The modern-day generator works on the principle of electromagnetic induction discovered by Michael Faraday in 1831-32. Faraday discovered that the above flow of electric charges could be induced by moving an electrical conductor, such as a wire that contains electric charges, in a magnetic field. This movement creates a voltage difference between the two ends of the wire or electrical conductor, which in turn causes the electric charges to flow, thus generating electric current.



1.4. Escalators:



Fig2.4: Escalators

In Majeera Shopping Mall have 22 Escalators each having 5 HP rating.

Escalators are one of the largest, most expensive machines people use on a regular basis, but they're also one of the simplest. At its most basic level, an escalator is just a simple variation on the conveyor belt. A pair of rotating chain loops pulls a series of stairs in a constant cycle, moving a lot of people a short distance at a good speed.

In this article, we'll look inside an escalator to find out exactly how these elements fit together. While it is exceedingly simple, the system that keeps all the steps moving in perfect synchrony is really quite brilliant.

1.5. Elevators:



Fig 2.5 Elevators

In the 1800s, new iron and steel production processes revolutionized the world of construction. With sturdy metal beams as their building blocks, architects and engineers could erect monumental skyscrapers hundreds of feet in the air.

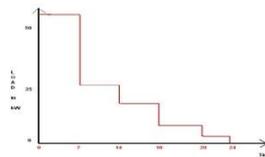
But these towers would have been basically unusable if it weren't for another technological innovation that came along around the same time. Modern **elevators** are the crucial element that makes it practical to live and work dozens of stories above ground. High-rise cities like New York absolutely depend on elevators. Even in smaller multi-story buildings, elevators are essential for making offices and apartments accessible to handicapped people.

In this article, we'll find out how these ubiquitous machines move you from floor to floor. We'll also look at the control systems that decide where the elevator goes and the safety systems that prevent catastrophes

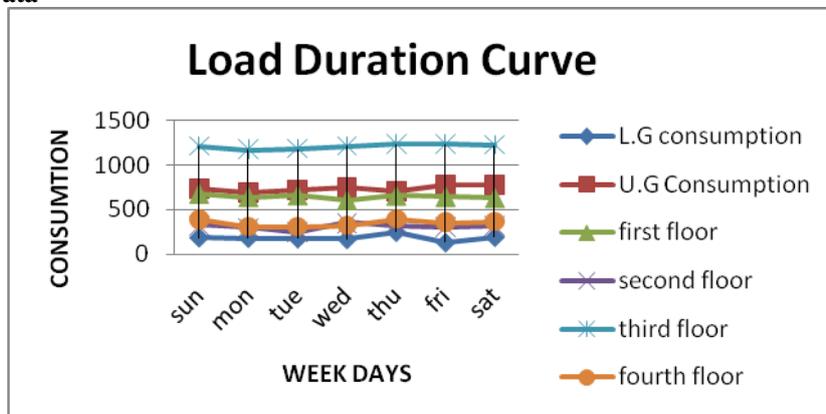
2. Load Duration Curve (LDC)

Load Duration Curve:

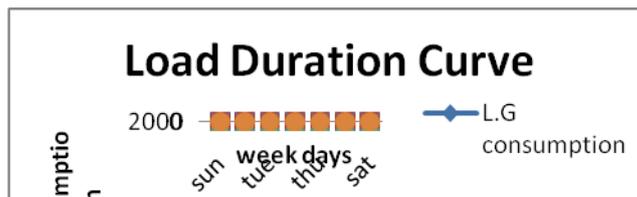
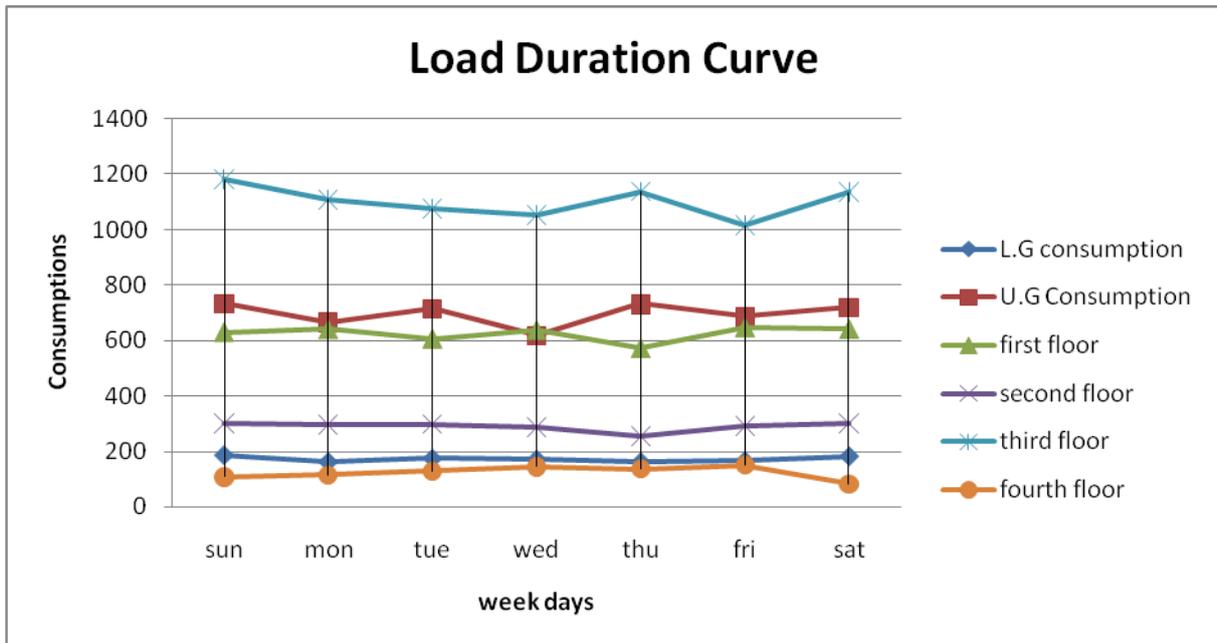
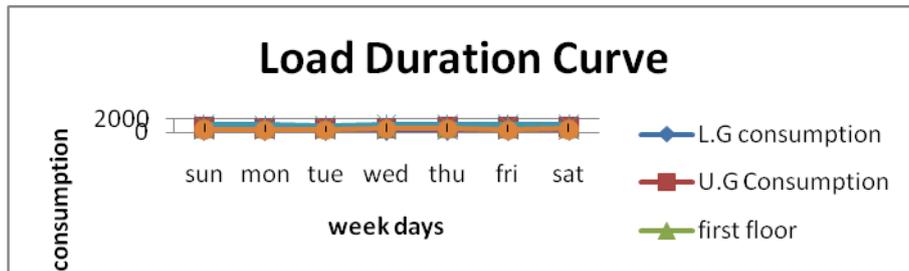
When the load elements of a load curve are arranged in the order of descending magnitudes, the curve thus obtained is called a **Load Duration Curve**.



3. Practical Collected Data



weekdays	L.G consumption	U.G Consumption	first floor	second floor	third floor	fourth floor
sun	187	733	629	301	1181	108
mon	163	665	639	297	1108	116
tue	175	716	605	299	1075	130
wed	172	617	637	288	1051	145
thu	163	732	571	255	1137	137
fri	167	685	646	293	1015	151
sat	183	719	640	303	1134	83



4. STATISTICAL METHODS

Paired sampled t-test:

If we want to test the significant difference between two sample means, we have applied t-test.

If we want to test the significant difference between two sample means, (before and after) we have to apply paired sample t-test. If t- significant value is less than 0.05 we reject null hypothesis. It means there is difference between before week and after week Data

5. Conclusion

Finally I conclude that Upper Ground floor and third floor are more attention is required regarding power factor point of view and replace out dated equipment with new equipment power consumed devices. By using this Analysis we can analysis instantly without any theoretically calculation.

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EFFECT OF DIFFERENT DEHYDRATION METHODS ON NUTRITIVE VALUE OF TENDER TAMARIND(TAMARINDUS INDICA L.) LEAVES.

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Introduction

Green leafy vegetables are a rich source of micronutrients. There are many varieties of green leafy vegetables which are rich and natural sources of nutrients, but are discarded and are not used for human consumption. Tender tamarind leaves (*Tamarindus indica* L.) are one of them, which are available at no cost and are very rich in many micronutrients. Tamarind or *Tamarindus indica* L. of the family Fabaceae is an indigenous tree to tropical Africa and also in some parts of south India. Every part of the plant finds atleast some use in food or medicine. Tamarind is an evergreen tree with a feathery evergreen foliage, fragrant flowers and long pods with edible pulp. The fruit pulp is used for seasoning, as a food component to flavour confections, curries and sauces and as a main component in juices and certain beverages throughout the greater part of India. Tamarind seed a by product of tamarind pulp industry is used as a raw material in the manufacture of polysaccharide (jellose), adhesive and tannin. The polysaccharide jellose can be used as a stabiliser in ice-cream, mayonnaise and cheese (Morton,1987;Siddig et al.,2006).flour from the seed can be used to make cake and bread (ICRAF 2007). Tamarind leaves and flowers can be eaten as vegetable and is used in a variety of dishes (ICRAF 2007). Leaves are rich in tannins and are a fair source of vitamin C and β - carotene. The leaves have high mineral content especially potassium, phosphorous, calcium and magnesium (Siddig et al., 2006). Nutritionalists are now encouraging the incorporation and utilization of green leafy vegetables in various recipes with minimum effort and little cost and yielding a great benefit by combating many micronutrient deficiencies. Through this study the less utilized tender leaves of *Tamarindus indica* which are rich in micronutrients but are mostly discarded or go waste was reached on and the effect of different methods of drying (sun,shade and oven) on their nutritive value was assessed.

Key words: Tender leaves, blanching, tray drying, microwave drying, proximate analysis

Methodology

The tender leaves of *Tamarindus indica* were collected during season from local market.

Preparation of leaves for drying

Sorting

Fresh, green, un-damaged leaves were selected. Bruised, decayed and wilted leaves were discarded before washing as they can lead to loss of nutrients and give bad flavour (Adeyeye and Otokiti, 1999).

Washing

The leaves were separated from the stalk and washed thoroughly three to four times in running water to remove adhered dust and dirt particles. After washing the leaves were allowed to stand for some time to completely drain away extra water and to air dry the leaves. The residual moisture was removed at room temperature before actual drying process on a clean cloth to prevent fungal growth. After complete air drying the leaves were weighed and equally distributed in three batches for sun, shadow and oven drying.

Drying

The leaves were dehydrated by (i) Sun drying; (ii) shadow drying and (iii) Tray drying.

Sun drying:

After preliminary treatments the tender leaves were placed on neat cotton cloth and placed in direct sunlight away from dust covering it with a neat cloth to prevent dust and insects. The leaves were occasionally turned to ensure even drying. The leaves were kept inside at nights to prevent uptake of moisture by leaves and lengthen the drying time. The leaves took three days for complete drying in the sun.

Shadow drying:

In shadow drying the leaves were placed on cotton cloth and were kept in room which was well ventilated with air flow. The leaves were occasionally turned to ensure even drying. It took five days for complete drying and become crisp and brittle.

Tray drying:

The leaves were loaded on the trays as a thin layer and kept in the tray drier. The leaves were dried by forced air technique. The drier was preheated to 60°C before the trays were placed in it. The temperature was maintained at 60°C and the leaves were dried sufficiently till they become crisp and brittle with occasional turning for uniform heating. The leaves took five to six hours for complete drying.

The dried leaves were packed in neat polyethylene pouches before analyzing. The dried leaves were analyzed for (i) Proximate composition (protein, fat) (ii) Vitamin C and β - carotene and (iii) Minerals (Calcium, iron) using standard procedure of AOAC (2004).

Determination of proximate analysis:

The proximate analysis of tender tamarind leaves were carried out by standard methods.

The following instruments were used for analysis.

Determination of moisture content:

The sample is weighed in duplicates in petridishes and kept in hot air oven maintained at 105 \pm 2°C and heated till two consecutive readings are same.

Determination of protein content:

The protein content of the dehydrated samples was determined using Kjeldhal apparatus.

Determination of ash content:

Ash content of the sample represents the inorganic residue remaining after the destruction of organic matter or the mineral content present in the sample. The ash content was determined using Muffle furnace maintained at 525°C for 4-6 hrs.

$$\% \text{ash content} = \frac{\text{weight of ash} \times 100}{\text{Weight of sample}}$$

Determination of fat:

The fat content of the samples were determines using a Soxhlet extraction apparatus and by the formula

$$\% \text{ fat content} = \frac{\text{weight of ether soluble material} \times 100}{\text{Weight of sample}}$$

Determination of crude fiber:

Crude fiber is the organic residue which remains after the food sample has been treated with boiled acid and alkali solution. The instrument fibra plus is used for analysis. Crude fiber was determined using the formula

$$\% \text{ crude fiber} = \frac{\text{loss in weight}}{\text{Weight of sample}} \times 100$$

Table 1. Proximate composition of dehydrated tender tamarind leaves (per 100g leaves).

Nutrient	Fresh leaves	Sun dried sample (%)	Shadow dried (%)	Tray dried sample (%)
Moisture (%)	70.5	4.2	4.8	4.6
Protein (g)	5.8	12.2	12.6	13.2
Fat (g)	2.1	3.5	3.92	3.63
Fibre (g)	1.9	10.68	12.5	11.8

Table 2. Mineral composition of dehydrated tender tamarind leaves.

Nutrient	Fresh leaves	Sun dried sample (%)	Shadow dried (%)	Tray dried sample (%)
Calcium(mg)	101	3090	3120	3200
Iron (mg)	5.2	86	91	81

Results

Dehydration of tender *Tamarindus indica* leaves

The time taken for dehydration along with dehydration curves and yield for different types of dehydration are presented below

Dehydration curves

1. Sun drying

The time taken and loss of weight of tender tamarind samples during sun drying is presented in the table below

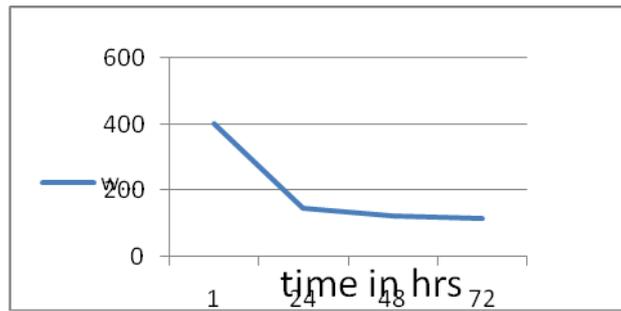


Fig.1 Dehydration curve for sun drying

2. Tray drying

The time taken and loss of weight of tender tamarind samples during tray drying is presented in the table below

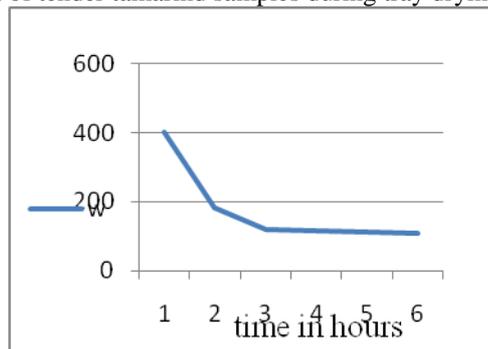


Fig.2 Dehydration curve for tray drying

3. Shade drying

The time taken and loss of weight of tender tamarind samples during tray drying is presented in the table below

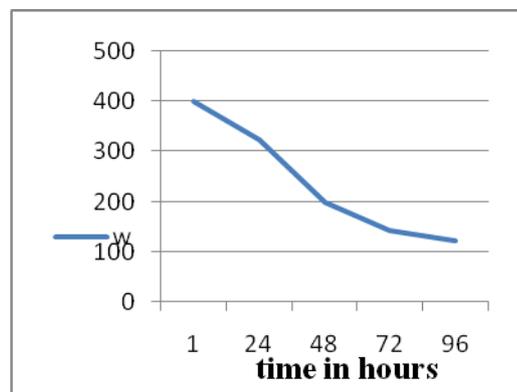


Fig.3 Dehydration curve of shade drying

Yield of tamarind leaves dehydrated by various methods

The time taken for dehydration and the percentage of yield of tender tamarind leaves dehydrated by different methods are presented in the table below.

Table: 6 Dehydration time and yield of tender tamarind leaves

Method of drying	Time taken for drying in hours	Yield (%)
Sun drying	72	29.3
Shade drying	118	30.75
Tray drying	6	27.5

Moisture content

The moisture content in the three samples of the dehydrated leaves was in the range of 4-5%. Maximum moisture content (4.8%) was in the shadow- dried sample and minimum was in the sun dried sample (4.2%).

Protein content

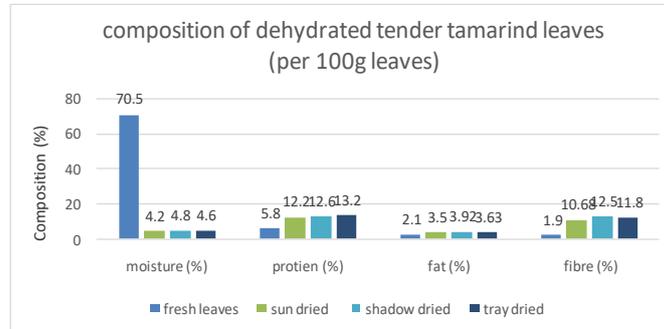
The protein content in the three samples of the dehydrated leaves was in the range of 12-13g per 100g. Maximum protein content (13.2%) was in the tray dried sample and minimum in sun dried sample. The difference in the protein content of the three samples of the leaves compared to the fresh leaves was statistically significant (p<0.05).

Fat content

Fat content of the three dehydrated leaf samples was in the range of 3.5-3.9%. the fat content was highest in the shadow dried sample (3.9%) and was lowest in sun-dried samples (3.5%).

Fibre content

The fibre content in the three samples was in the range of 10.6-12.5% with the highest level in shadow dried sample (12.5%) followed by tray dried and minimum values of fibre was found in sun dried sample.

**Mineral composition**

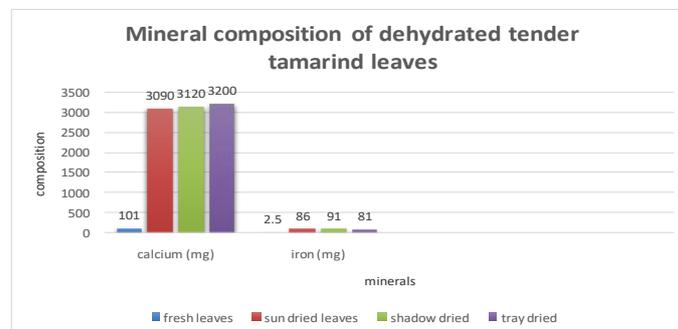
Mineral composition of dehydrated tender tamarind leaves (per 100g leaf powder) is given in Table 2.

Calcium

Fresh tender tamarind leaves have a calcium content of 101 mg/100g fresh leaves where as the calcium content in leaves prepared by different methods of dehydration was in the range of 3090 mg to 3200 mg/ 100g dried leaves. The difference in the calcium content of the three samples was statistically significant.

Iron

Fresh tender tamarind leaves have an iron content of 5.2 mg/100g of fresh leaves where as the iron content of leaves prepared by different methods of dehydration was in the range of 81-91 mg/100g. Maximum amount of iron content was in the shadow dried sample (91mg) followed by sun dried sample (86mg) and it was lowest in tray dried (81mg). The difference in iron content of the three samples was statistically significant.

**Vitamin composition**

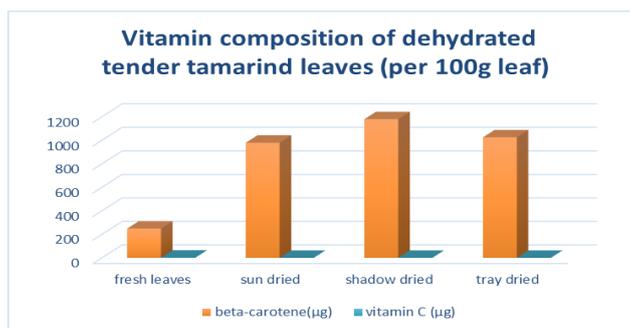
Vitamin composition of dehydrated tender tamarind leaves (per 100 g leaf) is given in Table.3.

Beta – carotene

The maximum retention of beta- carotene was in shadow dried sample, (1180 µg) followed by tray dried sample (1026 µg) and a minimum level of (980 µg)/ 100g leaf in sun dried sample. Shadow drying though took longer time than sun and tray drying, lead to lower carotene losses. The difference between the three samples of tender tamarind leaves was statistically significant.

Vitamin C

Vitamin C content of the dehydrated leaves was less than the fresh sample. This was the nutrient, which reduced after dehydration as it is oxidized rapidly on exposure to exposure to air and heat. The maximum amount of vitamin C was in shadow dried samples as the leaves were not exposed to direct sun light or heat.



Discussion

The results of the analysis showed that dehydration of leaves increased the nutrient content of leaves and they became a concentrated source of nutrients. The results are in agreement with the studies done by Jemina Beryl and Bhavani 2004 in dehydrated green leafy vegetables (cauliflower). Similar findings were reported by Lakshmi and Vimala (2000) which showed that the leaves retained good amounts of proteins, calcium and fibre in various samples of leaves dried by sun and cabinet drying. There was a significant increase in the mineral and vitamin content of the leaf samples after dehydration. Iron and calcium content increased in the dehydrated samples. The lowest losses of carotene was in shadow dried samples. There was a significant decrease in vitamin C content as it is a heat labile vitamin and is destroyed when exposed to sunlight and heat as it undergoes oxidation.

Conclusion

Dehydration resulted in concentration of nutrients. It is one of the best methods for preservation of green leafy vegetables which are easily perishable. The dehydrated tender tamarind leaves can serve as a source of nutrients and can be used in developing countries to combat micronutrient deficiencies.

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A COMPARATIVE STUDY OF DAPHNE DU MAURIER AND RABINDRANATH TAGORE AS GOTHIC WRITERS

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Abstract: This paper attempts to provide a critical analysis of works of Daphne du Maurier and Rabindranath Tagore, exploring style and themes. It would include an assessment of certain pivotal works such as Maurier's 'Rebecca' 'My cousin Rachel' and 'The birds' and Tagore's short stories like 'The lost jewels' 'The Hungry stones' and 'The skeleton'. The idea is to define the styles of the authors and establish certain similarities between them. The study aims to provide a distinction to authors within gothic genre by comparing them with classic gothic fictions such as 'The monk' by Matthew Gregory Lewis and 'Wuthering heights' by Emily Brontë. It is in order to investigate into points of deviations in style of the authors from classical features of gothic fiction. Daphne du Maurier being a modern gothic writer has set new trends in the genre thus represents a modernist approach in her treatment. Maurier's ability to haunt readers and to create persisting questions in the minds is a common gothic feature however arguably no one before her could perform the feat with same finesse as she did. Tagore's short stories have been mostly classified as horror or supernatural however they also contain certain gothic elements which have been less explored. Gothic genre being exclusive to the west has certain characteristics which cannot be recreated out of cultural context; interestingly Tagore's style added a twist to gothic at the same time maintaining a degree of familiarity with the genre's trademark techniques. Tagore blends elements of eastern supernatural with western gothic features to create a unique combination. Known mostly for his spiritual discourse among the critics of west, Tagore has been often neglected in consideration of his versatile style and genius which he showcases in his short stories. The purpose of the paper is to explore the styles and themes of authors and to establish social and literary relevance of the authors.

Key Words: Gothic fiction, Horror, Supernatural, Mystery, Tagore, Du Maurier

Ever since its introduction as a genre, Gothic fiction has always intrigued readers. In most general terms it can be defined as a genre that relies on startling scenery and an atmosphere of dread and mystery. A sense of impending doom characterizes the tone of many gothic works. It has come a long way from Horace Walpole's 'The Castle of Otranto: A Gothic story' (1764) which is generally regarded as the first gothic novel.

Gothic fiction as a genre has always depended upon borrowed elements; however it has still managed to achieve a sort of distinction from these elements, which is provided to it by the presence of a decrepit background. The backdrop thus, most definitely acts as a major 'character' within all works of gothic fictions. According to classical gothic novels, the setting of any gothic novel needs to adhere to certain ideals such as somber ambience, a wild and untamed environment, a sense of macabre, morbidity, decay, death but above all a gruesomely large building that lies at the centre of it all. This building more often than not, effuses mystery and lures the supernatural. These components strive to create an aberrantly sublime world which seems tranquil only on the surface. But these elements singularly cannot constitute the calamitous beauty of gothic fiction, therefore an emotional malady and a psychological exploration of the characters is required to tie these elements and construct something that can be termed as gothic aesthetics.

The gothic aesthetics can be used to provide disparity between works of gothic and related genres from which gothic fiction borrows elements or vice-versa. This concept has been mastered by Matthew Lewis in his 'The Monk' and Emily Brontë in her 'Wuthering Heights'.

'The Monk' places its emphasis on a chain of horrendous events that ultimately lead to the denouement. The gothic quality doesn't arise from the setting but rather from the complexity of characters and the circumstances. Lewis creates an emotional effect on the readers through presentation of unsettling actions, which horrify the readers. The essential elements such as morbidity, mystery and decay are evoked through characters and their actions. Lewis provides an insight into Ambrosio's emotional conflict and turmoil through his intense character exploration. What it lacks in construction of setting, the writer compensates it with dalliance in characterization. 'The monk' also successfully incorporates elements of supernatural and morality tale, which also adds a purpose to the work. It accurately satisfies most conditions of the concept of gothic aesthetics. Emily Brontë's 'Wuthering Heights' insists on the setting, which represents wild and savage nature of the characters. It is quite hard to differentiate between the feral environment and the protagonists. Heathcliff's uncouth way mirrors the wild and untamed nature that surrounds him. The characters of the book are so conflicted and contrasting that outside of the book and their setting, they don't make any sense. Therefore the setting in the novel enhances the mental struggle of the characters. It sort of blends in with the characters but still highlights their actions and thoughts. 'Wuthering Heights' unlike 'The Monk' relies heavily on creating a certain ambience which arouses reader's emotion beforehand therefore actions of the novel end up having more impact. The essential elements that constitute gothic aesthetics are met by the unforgiving moors and dilapidated houses which are symbolic of decay. The intense physical and mental cruelty

exhibited in the novel fiercely challenged the contemporary issues of gender inequality, class, morality etc. The abundance of emotional conflict creates instability which drives the story. The novel shows the consequences of an all consuming love through a tragic end and in the entirety of the novel no one truly attains peace. Only the wild moors remain unfazed in the end. The author truly masters the concept of gothic aesthetics.

Though being rooted in the 18th century gothic fiction has still managed to retain its relevance due to its changing forms over time with several authors experimenting with the genre. Writers like Anne Rice, Susan Hill, Poppy Z. Brite, Stephen King have shaped modern gothic fiction. However some have chosen to do away with certain trade mark features of gothic fiction in favor of modernist feel.

Daphne Du Maurier (1907-1989) holds a special distinction among modern proponents of gothic fiction. Her works inspired many female orientated gothic novels and created a renewed interest in gothic romances. Gothic romances have always been easy prey for parodies but Du Maurier steers clear of complexities that provide any free ground at the same time they still hold on to clichés that characterize female gothic.

Her works like 'Rebecca' and 'My Cousin Rachel' dearly hold on to the ideals of gothic romances. Handsome, mysterious men owning prime real estate are a key feature of such novels. Regardless of certain reoccurring elements and stereotypes, the author has provided certain redefining features and earned a sort of variance.

'Rebecca' was published in 1938 and has never gone out of print ever since. The novel is still remembered for its curious opening "Last night I dreamt I went to Manderley again" and its haunting end "And the ashes blew towards us with the salt wind from the sea." The plot begins with an unnamed narrator in her 20s falling for an older Englishman named George Fortescue Maximilian de Winter. After few days of courtship she gets married and returns with him to his beautiful country estate of Manderley. Once inside Manderley, she quickly realizes that the true lady of the house was Rebecca, the former Mrs. De Winter.

The plot is quite similar with many novels such as 'Jane Eyre' by Charlotte Brontë or with 'A Successor' by Carolina Nabuco.

The name of the protagonist is never revealed throughout the novel she is addressed as 'Mrs. de Winter' or 'my dear' and so on. The lack of a definitive name forbids the narrator from assuming a distinct presence in the novel thus she struggles in the shadow of Rebecca. This struggle is intensified with the rise of action until climax where she almost commits suicide. The author provides the details of the protagonist's conflict with her identity. This conflict forms the source of mental and emotional strain on the narrator. The overbearing environment of Manderley makes the narrator feel out of place, disoriented and inferior. The presence of cruel Mrs. Danvers constantly reminds the narrator of her shortcomings and how she would always remain in the shadow of her predecessor. Mrs. Danvers becomes the source of psychological distress of the protagonist, throughout the novel she reminisces about Rebecca and how she ran Manderley in order to belittle the narrator. The unhealthy obsession that Mrs. Danvers harbors for Rebecca resembles a jealous mother like figure. This feeling was so intense that Mrs. Danvers was willing to do almost anything to protect the legacy of her former mistress, even murder. The complex character of Mrs. Danvers intrigues the readers. She becomes the only source of information about the seemingly enigmatic Rebecca who even after death ruled Manderley. The cruel nature of Mrs. Danvers is overcome by the character of Rebecca.

As the novel proceeds towards its finale, the truth about seemingly perfect Rebecca is revealed. A closer analysis of Rebecca shows that she possessed all the symptoms of being a sociopath. She was a compulsive liar, who manipulated everyone around her. She showed very little conscience and emotion. An anecdote from Mrs. Danvers reveals that Rebecca also possessed sadistic tendencies. She torments her husband with lurid details of her sexual escapades and constantly undermines him. She also shows an uncanny sense of understanding of men's emotions. Her manipulation of Mr. De Winter finally leads to her violent death which forms the central mystery of the plot.

The gothic aesthetic states about creating a unity of action and background, where action should be driven by emotional conflicts and background should highlight its melodramatic effect. Rebecca has unity of these two elements. The emotional struggle and the mental anguish of the narrator are enhanced by the impersonal and cold Manderley. This unity creates a lingering effect on readers. The embellished world of Manderley seems unattainable and distant thus creating a feeling of superiority; the narrator forms the only sane link between the real world and the unhinged world of Manderley.

The presence of evil characters like Mrs. Danvers baffles readers and her final act of burning Manderley rather than letting the narrator have it shows the power of intense all consuming obsession. It is this final act that leaves the readers bewildered and creates an unsettling after taste, which is an important feature contributing towards creation of gothic aesthetics. Similarly Du Maurier's 'My Cousin Rachel' (1951) has many resemblances with Rebecca in terms of elements. The plot begins with Ambrose Ashley owner of a vast 'Cornish' estate and his ward Phillip. The central mystery of the novel comes

with the arrival of Rachel, who throughout the novel is mostly referred as 'My cousin Rachel.' Rachel's arrival changes Ambrose and this change is sensed by Phillip in Ambrose's letters to him, in which he realizes the strange nature of the circumstances. Ultimately the component of mystery is enhanced when Ambrose dies and Rachel arrives in his Cornish estate.

The emotional conflict of Phillip is shown. He believes Ambrose to be murdered by Rachel however struggles to prove it and ultimately gives in to charms of Rachel and decides marrying her. He still finds himself constantly worried and suspicious though. Much of the action deals with Phillip's struggle to overcome his emotions and believe Rachel however his rationality contrasts with this.

In terms gothic aesthetics, the background slightly fails to establish itself as a central force as in 'Rebecca' however it still provides a slightly detached and acerbic tone. The mystery surrounding Rachel's origins, Ambrose's death are never solved. The emotional conflict arises from Phillip's struggle to find the truth and make sense of Rachel. The conflict is enhanced with Phillip's growing feelings for Rachel.

Unlike Manderley or Wuthering Heights the setting of 'My Cousin Rachel' is not lingering. Out of context it does survive however, Manderley or Wuthering Heights are decidedly necessary for the action and emotional struggle of the plot and characters.

It is markedly weak in most elements of gothic aesthetics when compared with 'Rebecca.'

'The Birds' (1952) is immensely modern in its treatment. The emphasis placed on creating an abnormal chain of event which constitutes the element of mystery and nebulous tone of setting enhances this element to a point of insanity. It is, however not part of traditional genre of gothic fiction, however it is quite gothic in its sensibilities.

The major components of creating a gothic aesthetic include a driving mystery, a deranged sense of circumstances and the emotional desolation that arises from it.

The central mystery of birds and the somber tone of the seaside town achieve a bleak persisting feeling that remains with readers for days together. Du Maurier has skillfully implemented her talent to haunt readers with unanswered questions, insane action and complex psychological distress arising from the action.

The final scene with which readers reluctantly depart is one of the most evocative scenes when compared with rest of works of Du Maurier. The scene of Nat staring at fire as it consumes pack of cigarettes, which signifies the austerity of the result. It shows lack of hope with regards to consequences.

The modernist approach strives to create an inexplicable world where there is no definitive causation for actions thus it leaves room for speculation. The vivid details enhance the evoked imagery in the minds of readers who find themselves in a dispute with sense.

Du Maurier successfully creates the central mystery, a detached world, and the victims of this detached world and its atrocities. However it doesn't satisfy elements of gothic aesthetic such as a presence emanating building or certain driving characters. 'The birds' showcases an overpowering setting and an overpowered character. Nat is quite passive and his struggle doesn't arise from his dispute with his circumstances but rather from his acceptance of his final outcome and his apparent nonchalance.

Du Maurier demonstrates her capacity as a writer to inhabit the mind of her readers with her haunting stories that lurk even after the denouement.

Rabindranath Tagore (1861-1941) is the only Indian writer to have successfully created a story that can constitute gothic aesthetics. As a writer Tagore's versatility has always been ignored by western critics in favor of his spiritual discourses. Works of Tagore have always garnered attention for their rhythm and spiritual depth. However Tagore's mastery over poetry is just one aspect of his writing.

Tagore's short stories are derived from his deep understanding of Bengali world and from his secularity and assurance, given to him by his position. Apart from utilizing domestic scenes from urban Bengal, Tagore, in his short stories tended to explore fantastical elements. However these fantastical elements were never distracting.

The concept of gothic fiction has always remained exclusive to the west. Since the elements are equated only with the west. The stories of east are known for their vibrancy and flamboyant display of supernatural. The west believes in discretion when it comes to display of supernatural to make them seem more plausible, however that is not an issue in east as in east rationality can always be traded for belief. Even in the darkest of scenes there is always a light struggling to appear. In works of Tagore gothic found a unique blend which westerners couldn't possibly recognize as their own.

Tagore's story 'The Hungry stones' is a definitive example of gothic romance. The plot begins with the narrator and his kinsman encountering an enigmatic man in a rather mundane setting. The narrator describes him as a man of unusual knowledge, "He discoursed upon all subjects so confidently that you might think the Disposer of All Things consulted him at

all times in all that He did. Hitherto we had been perfectly happy, as we did not know that secret and unheard-of forces were at work; that the Russians had advanced close to us, that the English had deep and secret policies; that confusion among the native chiefs had come to a head. But our newly-acquired friend said with a sly smile: There happen more things in heaven and earth, Horatio, than are reported in your newspapers." The words uttered by the stranger exhort self confidence which seemingly arise from his worldly experiences.

As the stranger continues, he narrates a story of the most extraordinary nature, one that can easily be equated with the Arabian nights. Here Tagore provides a secular sense to gothic in his eastern adaptation of its elements.

In gothic novels the presence of a huge mansion is to not only act as a stage but also to add exclusivity. To create a stark contrast between the worlds and yet keep them, bound to one another to make the concept more believable. These imposing buildings burden the character, make them overpowered. These buildings become a source of fascination and mystery.

In 'The Hungry stones' Tagore willfully replaces these large European buildings and adds a magnanimous gilded palace. This palace adds an oriental flavor to the story. In terms of gothic aesthetics, this setting fulfills the requirements. It acts an imposing scenario that minimizes the character and gives a sense of larger picture. Apart from that, this building also becomes the source of story's central mystery and provides a stage for the supernatural elements to act upon.

'In his days jets of rose-water spurted from its fountains, and on the cold marble floors of its spray-cooled rooms young Persian damsels would sit, their hair disheveled before bathing, and, splashing their soft naked feet in the clear water of the reservoirs, would sing, to the tune of the guitar, the ghazals of their vineyards.'

Tagore describes the palace in all its luxury to contrast with its current decay but also to capture reader's imagination. This oriental description is also quite warm which is in stark contrast with the cold and reserved ambience of the western European mansions.

'I heard many footfalls, as if a large number of persons were rushing down the steps. A strange thrill of delight, slightly tinged with fear, passed through my frame, and though there was not a figure before my eyes, I thought I saw a bevy of joyous maidens coming down the steps to bathe in the Susta in that summer evening.'

Tagore very beautifully introduces the supernatural element of the story which is not horrifying but rather fascinating. However these beautiful supernatural elements become the source of conflict as the story proceeds. When the psychological distress of the narrator becomes apparent the readers understand the severity of the situation and are forced to re examine their stance.

The haunting lines "Stand back! Stand back!! All is false! All is false!!!" create a decidedly gothic feel.

As the narrator continues the emotional conflict becomes apparent and the psychological distress arises. The narrator is unable to detach himself from the grip of the palace and its supernatural entities and is thus very torn.

'The night was cloudy and moonless. In the dense gloom within I could distinctly feel that a woman was lying on her face on the carpet below the bed—clasping and tearing her long disheveled hair with desperate fingers. Blood was tricking down her fair brow, and she was now laughing a hard, harsh, mirthless laugh, now bursting into violent wringing sobs, now rending her bodice and striking at her bare bosom, as the wind roared in through the open window, and the rain poured in torrents and soaked her through and through.'

Here Tagore presents the element of horror. The vivid imaginary that can be defined as horrifyingly beautiful that renders the readers bewildered and baffled.

Tagore in his story explores various trademark elements of gothic fiction such as mystery, supernatural, horror but he also adds eastern elements such as fantasy and orient flavors. The gothic aesthetics are clearly met with the presence of an imposing building, a haunting mystery that is never clearly resolved, the psychological exploration of the character and his emotional conflict that arise from his circumstances that he finds himself unable to deal with. The tale also presents the consequences of possessing passionate emotions that linger even after their possessors have been long gone.

'The hungry stones' is a gothic tale adopted by an eastern writer who made it his own yet didn't depart from its original ideals or essence.

Another of Tagore's story that reeks of gothic elements is 'The lost jewels,' a tale of Bengal's elite class. The story begins on a stormy night and a chance encounter between two strangers. The setting of stormy nights is the most clichéd of all gothic settings. However the concept of mystery and mysticism is explored when the strangers start conversing and one of them offers to tell a story about a dilapidated mansion.

The character of Bhusan Saha and his wife Mani are members of Bengal's elite class. Gloriously wealthy and well educated. They live in relative recluse, like most of Bengali elite, surrounded by all things foreign and luxurious. Through the character of Bhusan, Tagore shoots sarcasm at the notions of the elites, who willing abandoned their culture and its virtues believing them to be inferior when compared to the west. In the story Tagore also portrays the sense the conflict within such

characters that drift between cultures and presents their difficulty in identifying themselves. When confronted with the unusual the character struggles in disbelief, even when the sheer volume of evidence is incriminating. Bhusan refuses to believe in the supernatural because it contrasts with his acquired enlightenment of the west which place their belief on empirical data and rationality but also consciously deject the notion of supernatural.

Tagore's another short story 'The skeleton' borrows certain pivotal elements of gothic but somehow leans more towards supernatural and fantasy or even magic realism. The story is about a skeleton who narrates her story to the protagonist who in the end is though not left visibly unsettled but is deeply impacted by it. It is not at all gothic in its feel but rather creates a same aftertaste as that of many gothic stories.

Tagore added native components to a foreign concept and created a harmony between the two different styles. His treatment of his story made gothic known to a culture, which never had the concept of gothic. Tagore successfully dabbles in elements of gothic such as Macabre and morbidity but still doesn't let himself stray towards its origins but rather creates a diversion towards a whole new culture and strives to keep the elements true to their parent.

Both Daphne Du Maurier and Rabindranath Tagore recreate the gothic feel in their own style. They tend to substitute original elements with something more relevant to make them more appealing to their contemporary readers. Du Maurier achieves originality all the while dabbling in clichés. She does this by investing in mystery and macabre. She does show complex characterization however it doesn't amount to the mastery of characterization achieved by Emily Brontë. The elements of macabre and morbidity also cannot be compared with that of the grand macabre of 'The Monk.' Du Maurier significantly tames the genre, refusing to allow it to wander into horror. She manages to keep it thrilling but significantly reduces fearful elements and replaces them deep psychological conflicts which can, to a certain degree provide a fearful emotional response but may or may not mimic the effect of physical elements of horror that are present in the 'The Monk.' 'Wuthering Heights' also steers clear of strong physical objects of horror in fear of overshadowing the plot but Brontë relies intensely on portrayal of wild and untamed environment which achieve a strong gothic feel that is far superior to 'Rebecca.' Brontë also replaces physical objects with insane characters that provide unpredictability, which adds the element of fear. But Du Maurier adds modernity to a relatively medieval genre and has contributed towards keeping its relevance intact in modern literature.

Tagore on the other hand cannot be compared with western proponents of the genre because of the unique nature and style of his work. He can be credited with introducing a new genre to the native literature. He skillfully omits and adds features creating a new blend and a distinct subgenre within the gothic genre. His notable use of oriental features makes the foreign genre relevant to the native readers but with this use he doesn't compromise with the core elements of the genre. Though his work is not wild or fierce but it is not docile either. The plot is not swayed by the presence of strong elements of the genre. He uses softer elements of the genre and combines them with eastern charm and fantasy. He dejects fierce and overpowering elements of fear but uses enough to keep the readers on their toes. His works don't leave readers visibly shaken or even disgusted but rather have an unsettling impact which resembles the modernist approach of Du Maurier. He recreated a thriving genre on his own terms yet staying true to its essence.

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A STUDY ON REMEDIATION OF ATTENTION IN CHILDREN WITH LEARNING DISABILITY

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Abstract: Four children with learning disabilities were taken for a training program aiming at remediating their attention deficits, thereby improving their learning efficiency. The duration of the training program was 25-30 sessions, where different neuropsychological tasks, i.e. Number Cancellation, Visual Neglect, Variant of Trail Making test, Digit Symbol, Stroop Effect and other attention improving tasks like Puzzles and Word Search tasks were employed. The children have displayed a significant improvement in their attention span by the end of the training program. This improvement has also been displayed in their academics where one of them showed improved scores in exams and the remaining three children have shown improved ability to put long and sustained effort in their academics. The remediation program has also improved certain abilities such as spellings which require a customized training program offered only in special schools.

INTRODUCTION

Learning Disabilities: Learning disabilities are neurologically-based processing problems. It is a general term that describes specific kinds of learning problems. The skills most often affected are reading, writing, listening, speaking, and doing mathematics. **They can also interfere with higher level skills such as organization, time planning, abstract reasoning, long or short term memory and attention.**

The unknown factor is the disorder that affects the brain's ability to receive and process information. This disorder can make it problematic for a person to learn as quickly or in the same way as someone who is not affected by a learning disability. People with a learning disability have trouble performing specific types of skills or completing tasks if left to figure things out by themselves or if taught in conventional ways. It is a neurological disorder that affects the brain's ability to receive, process, store, and respond to information. The term learning disability is used to describe the seemingly unexplained difficulty a person of at least average intelligence has in acquiring basic academic skills. These skills are essential for success at school and work, and for coping with life in general. "LD" does not stand for a single disorder. It is a term that refers to a group of disorders. Learning disabilities vary from person to person. One person with LD may not have the same kind of learning problems as another person with LD. One person may have trouble with reading and writing. Another person with LD may have problems understanding math. Still another person may have trouble in each of these areas, as well as with understanding what people are saying. **It is important to realize that learning disabilities can affect an individual's life beyond academics and can impact relationships with family, friends and in the workplace.** Interestingly, there is no clear and widely accepted definition of learning disabilities. Because of the multidisciplinary nature of the field, there is ongoing debate on the issue of definition. Overall, most experts agree on the following descriptions:

- ✓ Individuals with LD have difficulties with academic achievement and progress.
- ✓ Discrepancies exist between a person's potential for learning and what that person actually learns.
- ✓ Individuals with LD show an uneven pattern of development (language development, physical development, academic development, and/or perceptual development).
- ✓ Learning problems are not due to environmental disadvantage.
- ✓ Learning problems are not due to mental retardation or emotional disturbance.
- ✓ Learning disabilities can affect one's ability to read, write, speak, spell, compute math, and reason. They also can affect a person's attention, memory, coordination, social skills, and emotional maturity.
- ✓ Individuals with LD have normal intelligence, or are sometimes even intellectually gifted.
- ✓ Individuals with LD have differing capabilities, with difficulties in certain academic areas but not in others.
- ✓ Learning disabilities have an effect on either input (the brain's ability to process incoming information) or output (the person's ability to use information in practical skills, such as reading, math, spelling, etc.).

Research suggests that learning disabilities are caused by differences in how a person's brain works and how it processes information. Children with LD are not retarded or lazy. In fact, they usually have average or above average intelligence, but their brains process information differently. A learning disability affects the way children of average to above average intelligence receive, process, or express information. Even if the person learns to compensate and, in effect, overcomes the disorder, the difference in brain processing lasts throughout life.

Identification and Labeling As Learning Disabled: Many children have difficulty with reading, writing, or other learning-related tasks at some point, but this does not mean they have learning disabilities. A child with a learning disability often has several related signs, and these persist over time. The signs of learning disabilities vary from person to person. Common signs that a person may have learning disabilities include the following:

- ✓ Difficulty with reading and/or writing
- ✓ Problems with math skills
- ✓ Difficulty remembering
- ✓ Problems paying attention
- ✓ Trouble following directions
- ✓ Poor coordination
- ✓ Difficulty with concepts related to time
- ✓ Problems staying organized

A child with a learning disability also may exhibit one or more of the following:

- ✓ Impetuous behavior
- ✓ Inappropriate responses in school or social situations
- ✓ Difficulty staying on task (easily distracted)
- ✓ Difficulty finding the right way to say something
- ✓ Inconsistent school performance
- ✓ Immature way of speaking
- ✓ Difficulty listening well
- ✓ Problems dealing with new things in life
- ✓ Problems understanding words or concepts

The Relation Between Learning Disability and Attention: If a child has a learning disability there is a good chance that she suffers an attention deficit as well. Likewise, children with attention deficits often have learning disabilities. There can be varying degrees of severity in each area. Low severity in each area can have a cumulative effect and hinder school success. Attention and learning are very different and yet very dependent on one another. Educational therapy addresses both due to that dependency. Learning is the process of memorization, integration and application of new information and concepts. Attention is the process of prioritizing and applying information and concepts. The end dynamic of these two processes involves distribution of energy, priorities, and decision making once information is absorbed. If there is an attention deficit, the brain fails to prioritize information and the student will be unable to apply concepts learned in school. There are two possible deficits here: 1) Lacking the ability to absorb information in the first place or 2) Absorb the information but having no ability to apply it. This problem is compounded if there is also a learning disability that further complicates the acquisition or application of education.

Review Of Literature: This chapter provides an overview of previous research on the relationship between learning disability and attention deficits. The literature review presents two aspects of the relationship being studied:

The assessment of attention deficit in children suffering from learning disability
The effect of remediation and training on children with learning disability.

Studies related to the assessment of attention deficit in learning deficit.

Taking the relationship of attention and learning into account, this finding is important with respect to the design of individual learning programs and the teaching techniques chosen for the acquisition of skills and knowledge.

Hallahan, H.P. and colleagues in 1978 examined attentional processes in learning disabled youngsters. This particular study is controversial in that it proposes that learning disabled children may be capable of better verbal learning than they demonstrate — they simply fail to produce, though they allegedly possess the capability. To investigate the effects of reinforcement and response cost on the selective attention and verbal rehearsal performance of learning disabled children, a modified version of Hagen's Central-Incidental task was administered to 48 children enrolled in a private residential school for children with learning disabilities. A reinforcement condition facilitated both selective attention and verbal rehearsal (as measured by primacy effect), but a response cost condition did not. The results were discussed in relation to a "production deficiency" in learning disabled children. Production deficiency is a stage in recall strategy that is common to most children. It is exhibited by children who can use strategies for remembering that they have been taught by others but cannot produce strategies on their own.

Moll, K and colleagues in 2014, conducted a study on 99 primary school children and suggested the Cognitive Risk Factors for Specific Learning Disorder. Three domain-general cognitive abilities were investigated in children with Reading Disability and Mathematical Disability: processing speed, temporal processing, and working memory. Since attention problems frequently co-occur with learning disorders, the study examined whether these three factors, which are known to be associated with attention problems, account for the comorbidity between these disorders. The study found that all three risk factors were associated with poor attention.

Obrzut, J.E.; Hynd, G.W.; Obrzut, A. and Pirozzolo, F.J.(1981) studied the effect of directed attention on cerebral asymmetries in normal and learning-disabled children. Using a dichotic listening task, employing both undirected and directed attention conditions, cerebral asymmetries were examined in matched populations of 32 normal and 32 learning-disabled (LD) children (ages 7 yrs 6 mo–13 yrs 2 mo). The analysis of recall performance indicated that development was not a significant factor in either group; both the normal and LD Ss showed a right-ear effect, although the LD Ss performed at a degraded level and were unable to demonstrate a right-ear advantage (REA) when attention was directed to the left ear, unlike normal Ss, who produced the REA despite the directed attention conditions. Results suggest that LD children probably do not suffer from developmental delays but rather from a defect in callosal functioning that interferes with their ability to process verbal information simultaneously.

Pondé M.P. and colleagues (2011), assessed the impact of attention deficit on learning problems in a sample of 774 elementary school children in the city of Salvador, Bahia, Brazil. Each child was assessed by his or her teacher to evaluate ADHD symptoms and learning problems, using a standardized scale, *The Attention Deficit Hyperactivity Disorder Scale–Teacher’s Version* (Benczic, 2000). A very strong significant association was found between attention deficit and learning problems (prevalence ratio [PR] = 31.7) Results suggest that either the attention deficit leads to learning problems or that attention deficit and learning problems are comorbid conditions, in which case, learning problems may also contribute to secondary symptoms in ADHD.

Studies related to the improvement of performance brought about by training and remediation: Judith O. L et.al (1984) indicated that the EEG biofeedback training, if applied comprehensively, can be highly effective in helping to remediate children who are experiencing attention deficit disorders. six children were provided with long-term biofeedback and academic treatment for attention deficit disorders and considered the children primarily with specific learning disabilities, and, in some cases, there were varying degrees of hyper kinesis. Treatment also consisted of combining the biofeedback with academic training, including reading, arithmetic, and spatial tasks to improve their attention. All the six children demonstrated considerable improvement in their schoolwork in terms of grades or achievement test scores. None of the children were currently on any medications for hyperkinetic behaviour.

Lovett MW et.al (1989) took a total of 178 reading disabled children who were randomly assigned to one of three treatment conditions providing training in word recognition and decoding skills (DS), oral and written language (OWLS), or classroom survival skills (CSS. an alternative treatment control). Pre- and post-treatment comparisons on an array of standardized and experimental measures indicated that the two experimental treatments (DS, OWLS) resulted in improvement on selected tests significantly greater than that resulting from a third treatment intervention which controlled for treatment time and individual attention (CSS). The results indicated that some of the deficits associated with developmental dyslexia are amenable to treatment. These results were discussed with respect to (i) possible mechanisms by which disabled readers may acquire word recognition skills, (ii) their failure to acquire and use grapheme-phoneme correspondence rules, and (iii) a possible reduced tendency in the present population to generalize newly acquired specific knowledge to related knowledge domains.

Malone, L.D; Mastropieri, M.A (1991) randomly assigned Forty-five middle-school students with learning disabilities to one of three reading-comprehension training conditions: (a) summarization training, (b) summarization training with a self-monitoring component, or (c) traditional instruction. All students were interviewed before and after training regarding the strategies they typically employ during reading comprehension; during one training session, “think aloud” protocols were collected. Results indicated that students with learning disabilities trained in summarization procedures performed statistically higher.

These studies support the idea that learning disability can be remediated through training programs that aim to decrease the gulf between the individual’s potential and his performance. The present study that is focused in remediating the attention deficits of children with learning disabilities is in sync with research already done in that area.

METHODOLOGY

OBJECTIVES

To remediate the deficits of attention in children with learning disabilities thus bringing about an improvement in their academic performance

HYPOTHESES

Following are the hypotheses formulated:

- a) There would be an improvement in attention deficits (span of attention, focused attention) in the children after the training.
- b) The child would show improvement in academic performance after the training.

SAMPLE

The sample for the study consisted of children who were referred for poor scholastic performance and disturbances of attention. These children were assessed in detail on measures of intelligence (Raven's CPM) and a detailed learning disability index (NIMHANS), along with tasks of achievement. Out of this sample, four children who showed evidence of learning disability were taken for the study. These children also showed evidence of attention deficits in the psychological assessment.

The age of the children was between 8 to 10 yrs.

AGE (years)	SEX	GRADE
8	M	III
8	M	III
10	M	V
10	M	V

INCLUSION CRITERIA: The intelligence of the child is in the average range. Evidence of discrepancy between the ability and performance particularly with tasks involving reading and writing.

EXCLUSION CRITERIA: Any neurological illness (e.g. Epilepsy), Evidence of any traumatic brain injury, Evidence of any other psychiatric diagnosis including ADHD.

TASKS: The present study was a rehabilitation program for remediation of attention deficits of children with learning disability. The training for attention was done by using the following tests:

Digit Symbol Test,
Variant of Trail Making Test,
Number Cancellation –horizontal,
Number Cancellation – jumbled (1-50),
Stroop Test,
Visual Neglect,
Word Search,
Puzzles

The training was done for 25-30 sessions for each child with 45 minutes to one hour per session individually. The child was continuously supervised during the training period.

Tests Description: All the tests are time based and instructions were given to complete the tasks as quickly as possible. In all the tests, the time taken, the errors of commission and omission were taken.

Digit Symbol: This test presents the subject with a key in which numbers from 1 to 9 are printed in the top half of rectangular blocks, and in the lower half, a symbol is written corresponding to each number. Beneath the key, an array of 110 more squares are printed each of which contains numbers from 1 to 9 in a random fashion. The subject is required to fill in the blank spaces with corresponding nonsense symbols as quickly as possible. His score is the time required to fill in all the blanks.

Variant of Trail Making Test (A): Trail Making Test (A) consists of numbers (1 – 26) distributed over a sheet of paper. The child should draw lines to connect the numbers in sequential order. A variation of this test is used for the purpose of this study. A sheet of numbers (1- 26) and alphabet (A-Z) are distributed over a sheet of paper. The child should draw lines to connect the numbers in sequential order and after numbers, alphabet should be connected in the same pattern. If the child makes an error, the test administrator corrects them before the child moves on to the next number/alphabet. The time taken to complete each set is the child's score.

Cancellation Test: Cancellation tests have a long history in neuropsychological assessment. Most commonly, they are administered as paper-and-pencil tests that are normally used to assess a person's ability to visually search for an identifiable target and to either cancel or circle all such target items in an array. They vary widely in their complexity from long letter strings, such as the "H" Test and "A" Test or number strings like the "2 and 7 Cancellation" Test. They may include symbols that are quite simple as in the "Star Cancellation," Teddy Bear Cancellation, and Symbol Cancellation tests. These tasks are assigned as measures of the capacity for sustained attention, concentration, visual scanning, and rapid response activation and inhibition.

Digit Cancellation Test - Horizontal: The subject is given one or two digits as a target, which he/she has to cross out from a list of numbers which are in the horizontal manner. The resulting score consists of the correctly crossed out numbers minus the incorrectly crossed out numbers.

Number Cancellation – jumbled: The subject gets one or two digits he/she has to cross out from a list of numbers which is in the jumbled manner. In the present study the child was given number from 1 to 50 distributed all over the paper and he/she has to encircle them in the ascending order.

Visual Neglect Task: In this task, a number of different geometrical shapes were drawn on a sheet of paper and the subject was asked to cancel a particular target shape at his/her fastest. The time taken as well as the number of targets missed were noted down.

Stroop Test: the Stroop effect is a demonstration of interference in the reaction time of a task. When the name of a color (e.g., "blue", "green", or "red") is printed in a color that is not denoted by the name (e.g., the word "red" printed in blue ink instead of red ink), naming the color of the word takes longer and is more prone to errors than when the color of the ink matches the name of the color. The Selective Attention Theory that color recognition as opposed to reading a word, requires more attention, the brain needs to use more attention to recognize a color than to word encoding, so it takes a little longer.

Word Search Test: this task is a word game that consists of the letters of words placed in a grid, which usually has a rectangular or square shape. The objective of this puzzle is to find and mark all the words hidden inside the box. The words may be placed horizontally, vertically, or diagonally. This task requires the individual to direct his/her selective attention to find the word from among many jumbled letters.

Puzzles: In a puzzle, one is required to put pieces together in a logical way, in order to arrive at the correct solution of the puzzle. Puzzles are often devised as a form of entertainment but they can also arise from serious mathematical or logistical problems. Solutions of puzzles often require the recognition of patterns and the creation of a particular kind of order. Sometimes not because of how complicated and diagonal the pattern can get. People with a high level of inductive reasoning aptitude may be better at solving such puzzles than others. For the child to engage in reasoning, he/she should first pay selective attention to solve it.

RESULTS

Children who show distinguished learning disability according to the NIMHANS learning disability index are taken for the study. Preliminary tests relating to academic performance such as reading, writing, comprehension, mathematics, spelling and tests relating to attention span and an IQ assessment were done. After assessment, the remediation program has been administered to each child for about 25-30 sessions of one hour each. The remediation effort has been focused on bringing about an improvement in the children’s attention span thus improving their other skills.

The details of learning disability index along with the tests of achievements before and after remediation effort were displayed in the form of the table for each child respectively.

THE LEARNING DISABILITY ASSESSMENT INDEX OF THE CHILD 1 IS AS FOLLOWS:

Table I(a) where decrease in **TIME TAKEN** shows improvement in the task performed

TESTS	FIRST ASSESSMENT	FINAL ASSESSMENT	EVALUATION
ATTENTION TASKS (DIGIT SYMBOL TEST)	7.18min	4.20min	Improved
NUMBER CANCELLATION (HORIZONTAL)	7.48min	5.35min	Improved
NUMBER CANCELLATION (JUMBLED)	6.13min	3.23min	Improved
TRAIL MAKING	7.25min	6.35min	Improved
STROOP TEST	2.13min	1.30min	Improved
WORD SEARCH	5.40min	3.12min	Improved
PUZZLE	3.36min	1.20min	Improved
VISUAL NEGLECT	3.30min	2.28min	Improved

Table I (b) where decrease in **ERRORS** implies an improvement in the task performed

TESTS	FIRST ASSESSMENT	FINAL ASSESSMENT	EVALUATION
SPELLINGS(ERRORS)	5/8	3/8	Improved
MEMORY (FAMILIAR AND UNFAMILIAR PAIRS)	0/5, 1/5	0/5, 0/5	Improved

Table I (c) where increase in the **CORRECT RESPONSES** given implies an improvement in the task.

TESTS	FIRST ASSESSMENT	FINAL ASSESSMENT	EVALUATION
CPM	29	29	No improvement
DIGIT SPAN	6,5	6,5	No improvement

THE LEARNING DISABILITY ASSESSMENT INDEX OF THE CHILD 2 IS AS FOLLOWS:**Table II (a)** where decrease in **TIME TAKEN** shows improvement in the task performed

TESTS	FIRST ASSESSMENT	FINAL ASSESSMENT	EVALUATION
ATTENTION TASKS (DIGIT SYMBOL TEST)	6.6 min	3.57 min	Improved
NUMBER CANCELLATION (HORIZONTAL)	7.44 min	5.10 min	Improved
NUMBER CANCELLATION (JUMBLED)	6.32 min	3.45 min	Improved
TRAIL MAKING	6.58 min	5.15 min	Improved
STROOP TEST	1.55 min	1.27 min	Improved
WORD SEARCH	4.28 min	3.2 min	Improved
PUZZLE	4.18 min	2.20 min	Improved
VISUAL NEGLECT	4.50 min	3.12 min	Improved

Table II (b) where decrease in **ERRORS** implies an improvement in the task performed

TESTS	FIRST ASSESSMENT	FINAL ASSESSMENT	EVALUATION
SPELLINGS(ERRORS)	3/8	3/8	No improvement
MEMORY (FAMILIAR AND UNFAMILIAR PAIRS)	0/5, 3/5	0/5, 0/5	Improved

Table II (c) where increase in the **CORRECT RESPONSES** given implies an improvement in the task.

TESTS	FIRST ASSESSMENT	FINAL ASSESSMENT	EVALUATION
COLOURED PROGRESSIVE MATRICES (CPM)	30	32	Improvement
DIGIT SPAN	6,4	7,5	Improved

THE LEARNING DISABILITY ASSESSMENT INDEX OF THE CHILD 3 IS AS FOLLOWS:**Table III (a)** where decrease in **TIME TAKEN** shows improvement in the task performed

TESTS	FIRST ASSESSMENT	FINAL ASSESSMENT	EVALUATION
ATTENTION TASKS (DIGIT SYMBOL TEST)	6.33 min	5.12 min	Improved
NUMBER CANCELLATION (HORIZONTAL)	17.37 min	11.5 min	Improved
NUMBER CANCELLATION (JUMBLED)	11.32 min	3.42 min	Improved
TRAIL MAKING	14.25 min	7.55 min	Improved
STROOP TEST	2.30 min	1.40 min	Improved
WORD SEARCH	7.13 min	5.21 min	Improved
PUZZLE	7.9 min	4.16 min	Improved
VISUAL NEGLECT	8.43 min	5.38 min	Improved

Table III (b) where decrease in **ERRORS** implies an improvement in the task performed

TESTS	FIRST ASSESSMENT	FINAL ASSESSMENT	EVALUATION
SPELLINGS(ERRORS)	4/8	3/8	Improved
MEMORY (FAMILIAR AND UNFAMILIAR PAIRS)	1/5, 1/5	0/5, 1/5	Improved

Table III (c) where increase in the **CORRECT RESPONSES** given implies an improvement in the task.

TESTS	FIRST ASSESSMENT	FINAL ASSESSMENT	EVALUATION
COLOURED PROGRESSIVE MATRICES (CPM)	25	30	Improvement
DIGIT SPAN	5,5	5,5	No improvement

THE LEARNING DISABILITY ASSESSMENT INDEX OF THE CHILD 4 IS AS FOLLOWS:

Table IV (a) where decrease in **TIME TAKEN** shows improvement in the task performed

TESTS	FIRST ASSESSMENT	FINAL ASSESSMENT	EVALUATION
ATTENTION TASKS (DIGIT SYMBOL TEST)	10.27 min	6.29 min	Improved
NUMBER CANCELLATION (HORIZONTAL)	21.42 min	14.8 min	Improved
NUMBER CANCELLATION (JUMBLED)	15.55 min	7.30 min	Improved
TRAIL MAKING	11.44 min	8.48 min	Improved
STROOP TEST	2.6 min	1.25 min	Improved
WORD SEARCH	6.49 min	5.9 min	Improved
PUZZLE	6.53 min	4.19 min	Improved
VISUAL NEGLECT	9.23 min	6.37 min	Improved

Table IV (b) where decrease in **ERRORS** implies an improvement in the task performed

TESTS	FIRST ASSESSMENT	FINAL ASSESSMENT	EVALUATION
SPELLINGS(ERRORS)	2/8	2/8	No improvement
MEMORY (FAMILIAR AND UNFAMILIAR PAIRS)	2/5, 2/5	0/5, 1/5	Improved

Table IV (c) where increase in the **CORRECT RESPONSES** given implies an improvement in the task.

TESTS	FIRST ASSESSMENT	FINAL ASSESSMENT	EVALUATION
COLOURED PROGRESSIVE MATRICES (CPM)	34	34	No Improvement
DIGIT SPAN	5,3	5,3	No improvement

The results of the **paired t-test** on all the tasks for all the children were as follows. The observed t-value of **Spellings, Digit Span, Memory and Trail Making** was in the accepting region and thus, by accepting the null hypothesis, it was concluded that the difference in score between and after training was **insignificant**.

The obtained t-value of **Digit Symbol, Number Cancellation (jumbled and horizontal), Visual Neglect, Puzzle, Word Search and Stroop Effect** was in the rejecting region of the null hypothesis. It was therefore, concluded that the difference in score between and after training was **significant**.

The following is a tabular representation of the paired t-values of all the tasks used for remediation.

TEST	T-VALUE
Digit Symbol	*0.016953
Variant of Trail Making	0.10599
Number cancelation (Jumbled)	*0.032602
Number Cancelation (horizontal)	*0.056716
Stroop Effect	*0.039327
Visual Neglect	*0.026691
Puzzle	**0.007868
Word Search	*0.027031
Memory	0.101838
Spellings	0.21517

DISCUSSION:A descriptive analysis is given for each child that underwent remediation to further explain the effect of the same on their abilities.

Child 1 is 11 years old female studying in 4th standard. She was born through Caesarean delivery and her milestones occurred at the right time. She reported to be doing fine in her academic performance up until her 2nd standard but her disabilities started showing in her 3rd standard. Her assessment included intelligence test (CPM) and assessment of learning disability using the NIMHANS battery of learning disability.

She has scored average intelligence placing her in Grade 1. On achievement tasks specified in the NIMHANS battery, she did poorly in comprehension. She could read the passage (IV that is appropriate for her age), emphasizing on punctuations but when asked to narrate what she understood from the story, she could not. There was no logical sequence in her narration which showed that she could not comprehend what she read. She could comprehend the IIIrd level passage.

Her writing showed the extent of her attention deficit where she missed one whole paragraph while copying. Her performance in mathematical operations was very poor as she couldn't calculate numbers that had 3 and more than 3 digits.

Her attention span has improved greatly through the remediation program. In just a span of 10 sessions, she has shown significant levels of improvement. After remediation, she showed improvement in her spellings and memory. Her comprehension level has improved from IIIrd to IVth level passage in the NIMHANS battery of learning disability.

Her digit span however, remained the same.

By the time she finished her remediation, her attention levels have improved and this improvement was also evident in her academic performance when she scored above 75% in her class exams.

Child 2 is an 11 year old male studying 5th standard. He has reported to have achieved his milestones on time and his disabilities became tangible in 2nd standard. He had two older siblings who passed away due to an illness.

His score on the intelligence test CPM, puts him in the 80th percentile. He had shown gross disability in the achievement tests specified in the NIMHANS battery of learning disability. His spellings were very poor as he committed 5 errors out of 8 words given to him specified by the NIMHANS battery for his age level. His writing showed some dyslexic characteristics such as reversal of similar looking letters and lack of spacing.

His attention span increased as a result of the remediation process however this did not have any impact on his spellings and writing.

He did a poor job in comprehension when he could not understand the passage (IV specified to his age level by NIMHANS battery) read by him. He could not do even level III but was able to comprehend the passage of level II during assessment. After remediation, he went up one level high and was able to read and explain passage of level III.

His digit span has increased from 6, 4 to 7, 5.

His parents have stated that a noticeable change has occurred in his performance as he is now able to sit through long periods of time to study.

He is the only child in this program who showed an improvement in digit span.

Child 3 is a 10 year old male studying in IVth standard. He was born of consanguineous union. He has been referred for an intelligence assessment to explain his low performance in academics. An intelligence test (CPM) done puts him on average level of intelligence in the 75th percentile. However, while explaining the test, he showed gross inability to understand instructions. The instructions had to be repeated for upto three times. He had trouble answering the very first question in CPM owing to his inability to understand instructions which is a characteristic trait of learning disability. While answering the CPM, he would choose the answer without completely looking at the other options, pointing to his low attention span.

In his pre-remediation assessments, he exhibited incompetence and gave up the tasks in between without completing them. Providing him with a little bit of encouragement he completed them but with a great difficulty.

He responded very well to the training process which is shown in the post-remediation assessment. All of his attention tasks have shown marked improvement as he took lesser time in finishing the tasks. He showed significant improvement in tasks such as digit symbol, number cancellation, trail making, visual neglect, stroop effect, puzzle and word search. This remediation had a major impact on his spellings but it could not improve his digit span.

Child 4 is a 10 year old male studying in IVth standard. His parents were suggested by the child's class teacher to get the child through a remediation program for learning disability. The child displayed gross attention deficit in the pre-remediation assessment.

His writing is fairly neat as well as his spellings. However, he has shown major dislike to do tasks that require him to pay attention and concentration. This is one reason why he is not able to put effort in his academics. It was also reported that the child is good with reciting orally whatever he had learnt but cannot express the same in written form.

His writing is neat, however, he takes very long to write by copying from a book. If the same matter is dictated he takes five times lesser time than copying.

He showed significant improvement in tasks such as digit symbol, number cancellation, trail making, visual neglect, stroop effect, puzzle and word search. However, this remediation program couldn't improve his ability in spellings.

After the remediation process, he has shown improvement in sitting and concentrating long hours to study.

CONCLUSION

The children who were referred for poor scholastic performance and disturbances of attention and behaviour were assessed in detail on measures of intelligence and a detailed learning disability index (NIMHANS), along with tasks of achievement. The sample which showed evidence of learning disability attention deficits in the psychological assessment were taken for the training on remediating the attention deficits that spanned 25-30 sessions.

After the training was done for all the children, the results showed an improvement in attention deficits (span of attention, focused attention); in linguistic functions (spelling proficiency, reading skills, etc); and in academic performance.

It can be concluded that the training was helpful for remediation of attention deficits in all the children.

LIMITATIONS AND SUGGESTIONS:The study is not without its limitations which are given in detail below. Since the training program was done in a short span of time, though the outcome was evidently significant, it cannot be assured that the improvement will last for a longer period.

Due to the limited time bound of the study, the longevity of the improvement in the children could not be understood through periodical follow-up assessment.

The area of interest that the program aimed was “attention”. Therefore, the effects of the training program cannot be generalized to other abilities than attention.

The sample quantity is not sufficient to generalise the results of the sample to the major population.

SUGGESTIONS: Boosted follow up, after the training helps the child to be on the track of improvement in attention and other specific areas for each child mentioned earlier.

Because learning disability is a condition, constant effort should be made that will decrease the gulf between the child’s potential and performance. The chances are high that the progress in the child’s attention span would relapse if it is not done on a regular basis.

This study indirectly remediates the attention deficits in learning disability with an objective of improvement in other areas. The training also showed an improvement, if the training is continued it could give good results. The child would benefit even more if a wholesome program tailored to his/her needs is designed and implemented.

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ART-EXPRESSION ON AGGRESSION AND SELF-ESTEEM IN ADOLESCENTS.

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Abstract: Resentment, aggression, fears, sadness are feelings which shouldn't be ignored or suffocated. These basic human feelings can be managed and expressed through creativity. Expressing the emotions by practising visual arts, decorative arts and performing arts helps in healing anxiety and depression, in controlling aggression, reducing stress levels, increasing self-esteem and making positive changes in mood. Adolescence is a very confusing time, even for the well-adjusted teenagers. The age group faces conflicting demands from peers, parents, school and society along with internal and bodily changes. Artwork becomes a format that can increase discussion and enhances the possibilities for insight to break the ice with the help of non-verbal techniques. (Riley.S. (1999) *Contemporary art therapy in adolescents*. London, UK: Jessica Kingsley Publisher). The aim of the study is to compare the levels of aggression and self-esteem levels in 40 adolescents (13-19 years old) who practice expression through art and in 40 adolescents who do not do so. The comparison will be assessed using the standardized questionnaires i.e. BAQ (Buss-Perry Aggression Questionnaire) for assessing Aggression and RSES (Rosenberg Self-Esteem Scale) for assessing Self-Esteem.

Key Words: Aggression; art-expression; adolescence; self-esteem.

INTRODUCTION

Art-Expression is a platform where the feelings, emotions, thoughts, ideas and concepts come out as an immense help for few of the beings who find difficulty in conveying their message verbally or communicating it to people directly. These nonverbal cues become a space for imagination and creativity which can also be used as a vent for frustration, aggression, anxiety, depression and loneliness. The study uses a quantitative methodology where two standardised questionnaires are used. The first questionnaire used is Rosenberg Self-Esteem Scale (RSES) which is used to measure self-esteem. Self-esteem is a positive or negative evaluation of self. The concept of self-esteem is often referred as a personality trait and is an important aspect of social psychological researches. Self-esteem plays an important role in motivation and success, having an unhealthy self-esteem can bring mental illness and inability to grow as a person. The second questionnaire is Buss-Perry Aggression Questionnaire (BAQ) where the questionnaire is divided into four factors of aggression.

REVIEW OF LITERATURE

Effects of art therapy on anger and self-esteem in aggressive children; the intervention was performed once weekly for 10 weeks. The self-esteem and anger were measured at the beginning and at the end of 10 weeks, using the Cooper Smith Self-esteem Inventory (1967) and Nelson & Finch (2000) children inventory of anger. After 10 weeks, the art therapy group showed significant reduction of anger and improvement of self-esteem. Through the art therapy program, self-esteem improvement occurs as a result of the study and is in line with previous findings that revealed art therapy intervention is beneficial for improving self-esteem in children (Chin et. al. 1980; Harvey, 1989; Omizo & Omizo, 1989; Argyle and Bolton, 2005; Catterall & Pepler, 2007; Freilich & Shechtman, 2010.). In art therapy, there is no 'right' or 'wrong' way of doing art (Liebmann, 2008). In the study, different techniques of cognitive-behavioural approach in combination with art were used to improve self-esteem and reduce anger. (Alavinezhad R., Mousavi M, Sohrabi N, (2013) *Effects of art therapy on anger and self-esteem in aggressive children*, Iran. Published by Elsevier Ltd).

The main goal of the art therapy is to harmonize the development of the individual through the development of abilities of self-expression and self-discovery. A methodology of art therapy is based on the belief that the inner self of a person is reflected in the visual images whenever he draws, paints a picture or sculpts a sculpture. Formation of aggressiveness in adolescents is a result of the unfavourable development of the situation, the central element which is alienation, isolation of the child, the feeling of psychological discomfort. (Sablina, 2004). (Kasimova h. R, Gulnara F., 2016, *'Art therapy as a means of overcoming Aggressiveness in Adolescents'*, Kazan, Russia. Look Academic publishers).

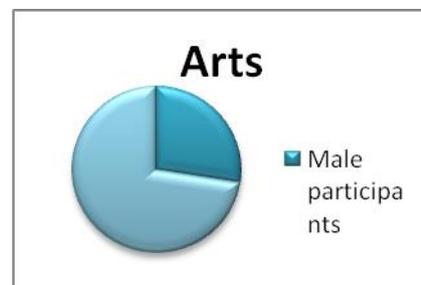
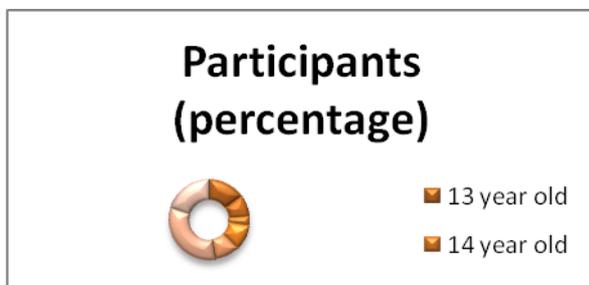
METHODOLOGY: Conceptualization In the study, I had two goals for which I chose quantitative methodology. Firstly, to compare the self-esteem levels in both the groups, proving that participants who practised art-expression on most days of the week had higher self-esteem than those who did not practise art-expression. Secondly, to compare the aggression levels by measuring the dimensions i.e. anger, hostility, physical-aggression and verbal-aggression in both the groups, proving that the participants who practised art-expression had lower levels of aggression than those participants who did not practice art-expression at all.

Research Instruments The self-esteem had been measured using the Rosenberg self-esteem scale (RSES), developed by sociologist Dr Morris Rosenberg, a self-esteem measure widely used in social-science research. It uses a scale of 0-30 where a score less than 15 may indicate a problematic low self-esteem. It is ten-item likert-type scales with items answered on a four-point scale—from strongly agree to strongly disagree. Five of the items have positively worded statements and five

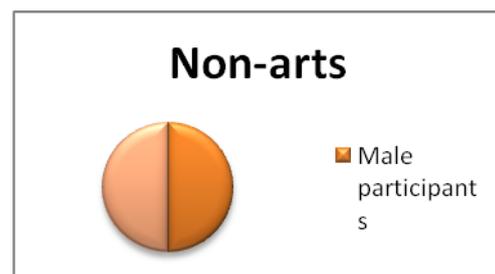
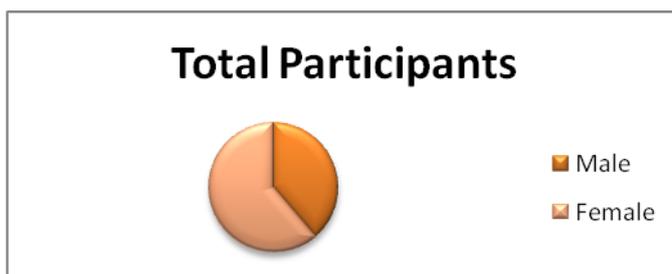
have negatively worded ones. The scale measures state self-esteem by asking the respondents to reflect on their current feelings. The Rosenberg self-esteem scale is considered a reliable and valid quantitative tool for self-esteem assessment. The aggression levels were measured using the Buss-Perry Aggression Questionnaire (sometimes referred to as the AGQ or simply the Aggression Questionnaire) was designed by Arnold Buss and Mark Perry, professors from the University of Texas at Austin in a 1992 article for the Journal of Personality and Social Psychology. It is a 29 item questionnaire where participants rank certain statements along with a 5-point continuum from "extremely uncharacteristic of me" to "extremely characteristic of me." The scores are normalized on a scale of 1 to 5, with 5 being the highest level of aggression. The questionnaire returns scores for 4 dimensions of aggression: Physical Aggression, Verbal Aggression, Anger and Hostility.

Population sample: The population of the sample was selected on basis of their practice with the art forms. Participants were a sample of eighty adolescents i.e. of the age group 13-19 years. The sample was further divided into two groups i.e. forty adolescents who practised art in most days of the week and forty adolescents did not indulge themselves into practising art. Thirty-one of the participants were male and forty-nine of the participants were female. The first group of the sample i.e. 'adolescents who practised art' had eleven male and twenty-nine female participants. The second group of the sample i.e. 'adolescents who do not practise art' had twenty male and twenty female participants.

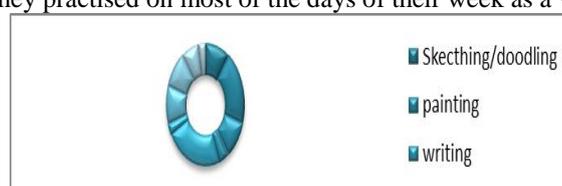
Profile of the respondents: The participants are the students of various schools and colleges located in the city of Secunderabad. The percentage of the participants in the study were as follows; 20% of 19 years old, 32.5% of 18 years old, 10% of 17 years old; 10% of 16 years old, 3.75% of 15 years old, 8.75% of 14 years old and 15% of 13 years old.



The total sample had 38.75% of male participants and 61.25% of female participants. The participants practising art expression were 13.75% male participants and 36.25% of female participants, while the participants who did not practise art expression were 25% of male participants and 25% of female participants.



Data-collection: The participants were given the Rosenberg self-esteem scale (RSES) and the Buss-Perry Aggression Questionnaire. The questionnaires have an extensive background in the field of social science research. Once the questionnaires were collected, the questionnaires were reviewed to check the gender and age were filled along with no omitted questions. The art forms that are considered in this study are 'paintings', 'theatre', 'dance', 'instruments', 'sketching/doodling', 'vocals', 'story-telling', 'sculpture-making', 'animation', 'writing/journaling', 'photography', and an additional space was provided for an open ended option stating "others, where the respondents could write down any ambiguous way of art form which they practised on most of the days of their week as a vent for their expression of emotions.



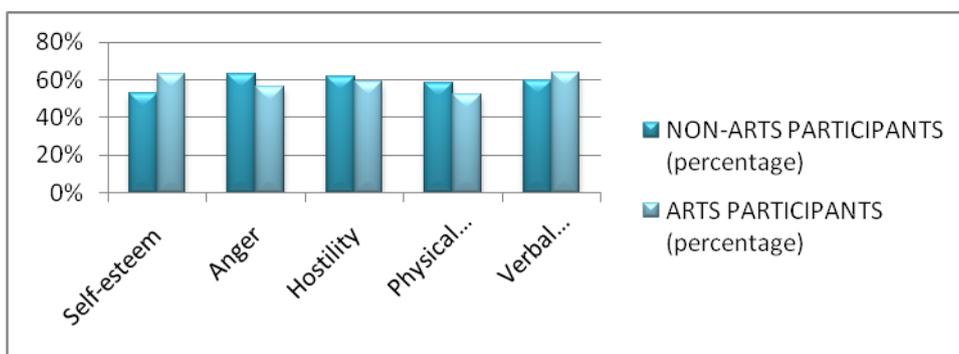
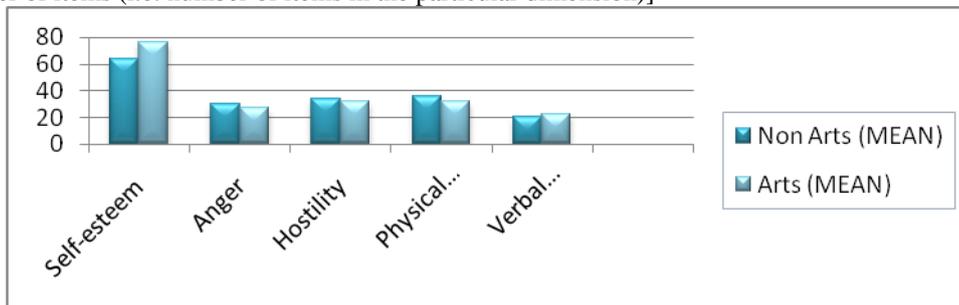
RESULTS AND DISCUSSION

Analysis: To obtain the results of the study, the scoring manuals were used and further the mean and percentage for both of the questionnaires were calculated. In RSES, we use 0-3 point scale system. For items 1, 2, 4, 6, 7: Strongly Agree=3, Agree=2, Disagree=1, and Strongly Disagree=0. For items 3, 5, 8, 9, 10 (scored in reverse order): Strongly Agree=0, Agree=1, Disagree=2, and Strongly Disagree=3. The scale ranges from 0-30, with 30 indicating the highest score possible. The BAQ has 29 items yielding a minimum score of 29 points and a maximum score of 145. The BAQ has subdivided in four factors: Physical aggression has 9 items, yielding a minimum score of 9 and a maximum score of 45. Verbal aggression has 5 items, yielding a minimum score of 5 and a maximum score of 25. Anger has 7 items, yielding a minimum score of 7 and a maximum score of 35. Hostility has 8 items, yielding a minimum score of 8 and a maximum score of 40. For which the question number 9 and 16 are to be given a reverse score.

Result: In the Rosenberg self-esteem scale, we obtained relevantly higher mean in the participants who practised art expression, than the participants who did not practice art expression. In the Buss-Perry Aggression questionnaire, the scores of the factors; anger, hostility, and physical aggression were higher in participants who did not practise art-expression, and the score of verbal-aggression is higher in participants who practised art-expression. The results obtained are shown in the following table:

	Non-Arts Participants (percentage)	Arts Participants (percentage)	Non-Arts Participants (mean)	Arts Participants (mean)
Self-esteem	53%	63%	64.10	75.9
Anger	63%	56%	30.21	27.10
Hostility	62%	59%	34.03	32.51
Physical aggression	58%	52%	35.89	32.44
Verbal aggression	60%	64%	20.75	22.17

[Percentage= sum of all the scores acquired divided by maximum marks multiplied by 100. MEAN= sum of all the scores divided by number of items (i.e. number of items in the particular dimension)]



Discussion: In ‘self-esteem’ we notice that the participants who practised art-expression have a mean score of 75.9 which is higher than those who do not practice art-expression i.e. with the mean score of 64.10, which explains that majority in of the participants who practise art hold positive evaluation of self and are satisfied with self. In the ‘anger’ dimension the participants who practised art scored a mean value of 27.10 which is lower than those who do not practise art where the score is 30.21, which explains that the participants who do not practise art-expression do not have a sense of control on their anger. In the ‘hostility’ dimension the participants who practice art-expression have scored a mean of 32.51 which is less than those who do not practice art i.e. 34.03 explaining that the majority of participants who do not practice art-expression hold a feeling of resentment, suspicion and alienation. The scores of ‘physical-aggression’ measure the tendency to use physical force while expressing anger or are seen higher in participants who do not practice art with the mean score of 35.89, and the participants who practise art-expression have obtained a score of 32.44. The scores of ‘verbal-aggression’ measure

the tendency to be verbally argumentative which are seen higher in the majority of the participants who practise art-expression with the mean score of 22.17, and the participants who do not express art hold a mean score of 20.75.

CONSIDERATIONS

Ethics: There were ethical considerations in this study. The first concern was consent of the participant to give in their responses. The participants are promised privacy, their details and responses are kept confidential and will be used for the study purposes only. The questions which were difficult to understand were explained personally.

Factors: There are different factors that can influence self-esteem and aggression. Genetic factors that help shape overall personality can play a role, but it is often our experiences that form the basis for overall self-esteem and anger issues. Those who consistently receive overly critical or negative assessments from caregivers, family members, and friends, for example, will likely experience problems with low self-esteem. Additionally, your inner thinking, age, any potential illnesses, disabilities, or physical limitations, and your job can affect your self-esteem. Media is another platform which creates insecurities if acceptance is not found.

Limitations: The close difference among the mean values might be due to the following aspects which help in the process of controlling the anger is by using other means of healing i.e. by reading books, performing yoga, and mind-body therapies, spending time with family and friends for laughter and humour, relating to pets, cooking or gardening, engaging in any creative process and small changes in our environment.

Personal findings: Art-expression for me is a way to the openness of mind, where one can work with their feelings and emotions without being questioned. When there is no environmental stress or societal pressure on how to work or feel there would be self-acceptance and self-awareness without external force. Art is a form of therapy which had helped me cope with my anxiety, and this is how the hypothesis had been framed. While working on the scorings of participants who did not practise art-expression, the participants with high self-esteem scores had high levels of anger, and those with low self-esteem also had high levels of anger. The scorings of the participants who practised art-expression; the participants with high self-esteem had lower levels of aggression and those with average and low self-esteem had high levels of aggression.

CONCLUSION

The study showed that there are not major significant differences regarding to aggression levels between the two groups of adolescents, among which one of the group engaged themselves in art-expression. A significant difference was seen in self-esteem scores which explains that majority of the participants who practised art expression had positive approach towards them-selves.

ACKNOWLEDGEMENT:

I would like to extend particular thanks to the participants and the lecturers for their input and time. I would also like to express an immense gratitude to the Loyola Degree and P.G. College for giving me an opportunity to contribute to the International Conference.

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HOME COMING :A SURVEY OF THE CHANGING NARRATIVE OF DIASPORIC RETURN IN 21ST CENTURY SOUTH ASIAN FICTION

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Abstract: One of the most persistent motifs in postcolonial literature has been that of homecoming. The protagonist of the classic postcolonial novel is a global migrant, displaced from his roots and homeland, grappling with issues of cosmopolitan rootlessness amidst memories of the lost home. A number of contemporary South Asian fiction on emigration, however, represents the trope of reverse migration not essentially within the context of the personal schema of negotiating private memories of the lost homeland, but invokes political issues of communal identity, environmental concerns and labour exploitation in the contemporary era of globalization, war on terror and transnational capitalism. This paper looks at contemporary South Asian fictions, particularly based on India and Pakistan, that foreground the notion of homecoming outside the conventional diasporic tropes of private memory, nostalgia for mythical homelands, and irreversible alienation, and instead reimagines the protagonists' return as affected by larger socio-cultural-economic concerns on a global scale. Subsequently, placing these novels in the context of the continued importance of the postcolonial nation state in the era of globalization, this paper also aims to look at the literary imagining of the postcolonial nation state as a recuperative space against the repressive forces of globalization.

Key Words: South Asian diasporic fiction, homecoming, nation, globalization

One of the most persistent motifs in postcolonial literature has been that of homecoming. The protagonist of the classic postcolonial novel is a global migrant, displaced from his roots and homeland, grappling with issues of cosmopolitan rootlessness amidst memories of the lost home. While nostalgia for the lost home, embodied into a mythical space of "imaginary homelands", materializes as a motif of intense desire for return in diasporic fictions, the process of actual return is often accompanied by a further alienation from the homeland that estranges, frustrates and threatens. Between the unrequited desire for return and the disappointment of actual return, homecoming has been recurrently invoked in South Asian diasporic fiction as an important theme of subjective reconciliation with the past for the deterritorialized identities of the diaspora. A number of contemporary South Asian fiction on emigration, however, represents the trope of reverse migration not essentially within the context of the personal schema of negotiating private memories of the lost homeland, but invokes political issues of communal identity, environmental concerns and labour exploitation in the contemporary era of globalization, war on terror and transnational capitalism. This paper looks at contemporary South Asian fictions, particularly based on India and Pakistan, that foreground the notion of homecoming outside the conventional diasporic tropes of private memory, nostalgia for mythical homelands, and irreversible alienation, and instead reimagines the protagonists' return as affected by larger socio-cultural-economic concerns on a global scale. Subsequently, placing these novels in the context of the continued importance of the postcolonial nation state in the era of globalization, this paper also aims to look at the literary imagining of the postcolonial nation state as a recuperative space against the repressive forces of globalization.

Late twentieth century postcolonial fiction, especially in English, has been dominated by narratives of the diasporic protagonists and their cosmopolitan rootlessness. The recurrence of this convention is symptomatic of the postcolonial writers' own expatriate status, as Elleke Boehmer points out:

For different reasons, ranging from professional choice to political exile, writers from a medley of once-colonized nations have participated in the late twentieth-century condition of migrancy.... In the 1990s the generic postcolonial writer is more likely to be a cultural traveler, or an 'extra-territorial', than a national. Ex-colonial by birth, 'Third World' in cultural interest, cosmopolitan in almost every other way, he or she works within the precincts of the Western metropolis while at the same time retaining thematic and/or political connections with a national background. (232-3)

In literary texts, the writers' own anxiety with migration and relocation takes the form of the stock figure of the diasporic protagonist grappling with the dilemma between the transmutation of acculturation and the status of older loyalties. The diasporic protagonist is in a perpetual fix on the question of belonging--his assimilation into the host nation is never complete, with a longing for the lost homeland persistently lingering in his state of being. The trope of homecoming thus assumes a symbolic meaning of returning to one's roots, a personal journey to negotiate the hauntings of the past and inching towards self-assertion from the dilemma of in-betweenness and rootlessness. Observing the predominance of the homecoming motif in postcolonial fictions from varied literary cultures, Vera Mihailovich-Dickman offers a survey of how the notion of return haunts the literatures of the Caribbean islands, Africa, South Asia and Australia. Dickman points out that Caribbean poetry, exemplified through Derek Walcott's famous ruminations on double-consciousness, is rich in a sense of expatriate longing for a lost collective identity displaced by the colonial process and an emphasis on 'metaphorical return', keeping faith with the "Caribbean of the mind" (x). In Australian fiction, 'homeland' invokes a dilemma of belonging historicized, against the original displacement from England and a negotiation with Australia's decolonised autonomy. Return to home in Australian fiction seen in works of Patrick White thus, as Gay Raines observes in the same volume, engages with a metaphorical universal quest for identity beyond the specificity of a geographical place (41-42). Of all the

these, African fiction presents the widest spectrum of homecomings, as Dickman recounts through the works of Bessie Head, Ama Ata Aidoo, Wole Soyinka and others, that engage with a variety of themes like exile, spiritual return and personal quest. Identifying the return to home as a recurrent motif in postcolonial diasporic fiction, Mahmud Rahman lists the essential characteristics of return novels that include i) autobiographical similarities with the diasporic author, ii) a return to specific place, house or neighbourhood, iii) return to a community and host of characters from the past iv) journey as a motif of change and reconciliation and v) a realist mode of writing. While this list is neither exhaustive nor quintessential to account for every return narrative in postcolonial diasporic fiction, it nevertheless highlights the recurrent motifs of return narratives that signify a personal quest for the protagonist.

The trope of the lost homeland and a desire for return haunts South Asian diasporic fiction almost invariably. The notion of “deferred home and myth of return”, as Ruth Maxey observes, haunts British Asian literature as a recurrent motif. Citing Monica Ali’s *Brick Lane*, Sarfraz Manzoor’s *Greetings from Bury Park* and Abdullah Hussain’s *Émigré*, Maxey observes how the protagonist’s desire to return makes him/her imagine the homeland as a deferred final destination that would bring closure to the journey of the emigrant. The homeland is thus often etched in terms of nostalgia, conjured as a mythical, dreamlike place crystallized in the consciousness of the emigrant and defined through intensely personal memories. As Rushdie cogently sums up the construct of the imaginary homelands:

Writers in my position, exiles or emigrants or expatriates, are haunted by an urge to look back, even at the risk of being mutated into pillars of salt. But if we do look back, we must also do so in the knowledge – which gives rise to profound uncertainties – that our physical alienation from India almost inevitably means that we will not be capable of reclaiming precisely the thing that was lost: that we will, in short, create fictions, not actual cities or villages, but invisible ones, imaginary homelands, Indias of the mind. (10)

Return in South Asian diasporic fiction is thus often intricately tied to a personal journey to one’s past or the roots---a longing to reclaim back a sense of belonging to the place of origin. This personal journey is exemplified in fictions like Anita Desai’s *Clear Light of the Day*. Desai’s protagonist, Tara, reconciles unresolved familial tensions through her return from the US. For Tara, the return is deeply personal journey that opens up her past with her siblings, who now having grown apart from each other, rekindle their connections and reconcile with a sense of closure. Tara’s return is thus just a catalyst for the reminiscences, for the narrative focus shifts from Tara to her siblings, offering a rich tapestry of the characters’ coming of age against the historical backdrop of India’s partition and post-partition. Having faced the ghosts of the past, the act of return ceases to hold any further significance for Tara who goes back. This intensely personal dimension of the return journey is also seen in Amit Chaudhury’s *A New World* as well, whereby Jayojit languidly floats through a personal journey in his visit to Calcutta. Divorced and a single father staying in the US, Jayojit rediscovers himself through the cityscape he had left behind, the internal monologues and reflections accounting for all the action in the novel. Return in South Asian novel portraying the diaspora is often a gesture of self-introspection brought out through the journey motif; conceived as more of a metaphysical construct than a physical, geographical place, the homeland here assumes a symbolic connotation in the protagonist’s journey towards self-discovery.

However, returns are not always reconciliatory. A more prominent motif in the diasporic return novels is that of the disenchantment the protagonist feels on his/her actual encounter with the mythical homeland; the desired return paradoxically ends with a sense of farther alienation for the protagonist who encounters a different homeland than the imaginary ones, making them despair for a release from the homeland again. Thus the US settled Tara in Bharati Mukherjee’s *Tiger’s Daughter* returns to the Calcutta of her childhood only to be jerked into the labour unrest and political turbulence that Tara finds distressing. The Calcutta of her childhood has changed irreversibly, and the bleakness and poverty she witnesses in her visit threatens and alienates her, making her yearn for the return to the US. Narrated from an unapologetically elite perspective, *Tiger’s Daughter* records the typical frustrations of a privileged expatriate who hopes to find the homeland in a static, pristine state and is shocked into realization by the presence of the quotidian mob. For Priya in Amulya Malladi’s *Mango Season*, the dilemma is reverse. Priya’s transit to USA has left an indelible mark on her, changing her worldview while her family back in India remain frozen in time. Priya’s return to India reveals not only the irreconcilable differences and her reverse culture shock, but also the physical and sensory discomfort that she finds hard to endure, thus shattering every bittersweet memory of India she carried from her childhood. As Maxey comments on the host of similar fictions on return---Manju in *For Matrimonial Purposes*, Mayain *Motherland*, Kirin Narayan’s *Love, Stars and All That*, Bapsi Sidwa’s *American Brats*, G.S Sarat Chandra’s *Sari of the Gods*---that “it is almost as though return to South Asia and the severing of nostalgic links...form a necessary stage in making the transition to a more fully-fledged American status” (87). Significantly, since the trauma of homecoming is narrated predominantly through female subjects who feel constricted by the conservative, patriarchal societal norms of their native countries, reverse migration often invokes a gendered discourse on diaspora versus the homeland embodied in the personal journey of the female protagonist.

However, for protagonists like Ondaatje’s *Anil’s Ghost*, the ordeal of homecoming conjures up issues way beyond the personal realm. Anil encounters a war-torn Sri Lanka that has turned corrupt, violent and genocidal, threatening Anil’s non-conformation with dire consequences. Similarly, though Maya’s return in Tahmima Anam’s *Good Muslim* and the consequent

estrangement with her brother is wrought in the intimacy of her private life, the novel reveals a bleak poster of Bangladesh's steady descent into Islamic fundamentalism after the civil war—an ironic turn of events in a country founded on cultural and secular principles. A similar trajectory of political violence is narrated in Meena Alexander's *Nampally Road*. Mira's return and her initial optimism is mired by the violence she witnesses in the police atrocities through Rameeza Bee's rape and the brutal murder of her husband. The sheer magnitude of state corruption and the repressive state machinery jerks Mira to a deeper realization of the unresolvable issues that trouble India. More often than not, return novels thus reveal a deeply flawed, chaotic and even dangerous homeland against the backdrop of violence and political turbulence. Here it is helpful to recall Makarand Paranjape's distinction between the older diaspora and the new diaspora in the context of the Indian diaspora. As Paranjape points out, the older diaspora—consisting of subaltern and underprivileged classes dislocated by colonial labour and indentured migration who could never return—imagines the homeland as a sacred site or symbol frozen in memory. The spiritual restructuring of the host land, accompanied by a fetishization of the symbols and icons they carried, constructed the homeland as a mythical, unreturnable space in the diasporic imaginary. In comparison, the new diaspora—consisting mostly of second generation diasporic Indians and voluntary emigrants who have unrestrained access to India—construct the homeland in a more cynical manner, seeing it as an area “of darkness, confusion, violence, but a hopeless and doomed country which much be rejected” (245). Though Paranjape particularly mentions Naipaul and his utterly bleak portrayal of India in *Million Mutinies* and the other travelogues, the metropolitan writer's apathy towards the nation and its borders is evident in innumerable texts.

The prominent discourse that emerges from these novels is the popular conceptualization of the postcolonial nation-state as a dystopian entity with its parochial, repressive machinery, operating on divisive and violent forces. As the 20th century witnessed the excesses of nationalism leading to the evils of colonialism, holocaust, world wars and inter-ethnic conflicts, the dominant cultural theories of the period including postmodernism and postcolonialism have focused on concepts of a “postnational” culture, celebrating notions of hybridity, migrancy, cosmopolitanism, liminality and others that signal the arrival of a new era of democracy-without-borders. Subsequently, the postcolonial nation state has been conceptualized as intricately flawed organization forcibly attempting homogeneity at the cost of violently oppressing its own people. Early postcolonial theorists—including Bhaba, Chatterjee, Fanon, Spivak—unanimously express their deep distrust about the nation state. Thus locating a “particular ambivalence that haunts the idea of the nation” (1), Bhaba theorizes the nation as a mutating construct whose metaphorical unity is an impossibility, being constantly challenged from the diverse forces within: “in this sense then the ambivalent, antagonistic perspective of nation as narration will establish the cultural boundaries of the nation so that they may be acknowledged as containing thresholds of meaning that must be crossed, erased, and translated in the process of cultural production” (1). Partha Chatterjee's *Nation and Its Fragments* is an impassioned critique of the postcolonial Indian state that thrives by co-opting its marginal communities into a meta-narrative of homogenous nationalism. For Chatterjee, nationalism is “a dark, elemental, unpredictable force of primordial nature threatening the orderly calm of civilized life” (4). Theorizing the nation state as an essentially bourgeois construct, Fanon despairs at how anti-colonial movements are inevitably usurped by the native bourgeoisie to produce a postcolonial nation state that not only alienates the commoner masses but also paves way for neo-colonial capitalistic exploitation. Mired with such problematics, the “demise” of the nation state as a result of contemporary globalization has more often been celebrated than mourned.

The late 20th century thinkers have thus emphatically spoken for statelessness over the borders of the nation, globalization over national belonging. Appadurai proclaims the death knoll of the nation-state with the emergence of the “diasporic public sphere” asserting that the nation state is on “its last legs” and will not be able to sustain itself as “long term arbiters between globality and modernity” (19). The nation-state has thus been perceived as both vicious and obsolete, with the political and cultural discourse of our contemporary times shifting to global, transnational paradigms. It is to be noted that more than the idea of the ‘nation’, it is the political construct of the ‘state’ that has been cited as the crux of the problem. Thus, critics like Fanon and Spivak make space for “nation” thinking but vehemently oppose the parochialism of the geo-political construct of the “nation-state”. Thus, while Fanon's *The Wretched of the Earth* calls for an idealistic nation based on popular nationalism arising out of the grassroot movement of the masses as an abstraction but cautions against the actuality of the political form, Spivak in seminal works like *Who Sings the Nation-State* and *Nationalism and Imagination* advocates a deterritorialized “cultural nationalism” over the territorial “political nationalism” or what she calls as “the re-invention of the civic state in the so-called Global South, free of the baggage of nationalist identitytarianism, and inclining toward a critical regionalism, beyond the national boundaries” (88). In keeping with these perspectives, postcolonial literature, particularly from the diasporic perspective, invokes nation thinking in ambiguous, deterritorialized forms while rejecting the oppressive, restrictive politico-legal site that is the ‘state’.

Yet, South Asian narratives of migration and homecoming in the 21st century have noticeably changed in the way the nation state is imagined. While one of the major waves of contract, low wage and wage less labour migration of South Asians was facilitated by the British colonial system of indentured labour and the modes of its economic exploitation, contemporary labour migration from South Asia have been redefined by more amorphous forces of global capital flow that has decentralized the affluent economic hubs beyond the Anglo-American geopolitical space to global centers of Middle East and South East Asia as well. Saskia Sassen points out that the globalization of capital, particularly after the neoliberal economic reforms in the 70s and 80s have led to the emergence of a new kind of economic centres—the global cities that

serve as central nodes for management of international trade, investment and form the heart of the world economy. Consequently, as Sassen notes, the transnationalization of capital has gradually led to a shrinking of manufacturing jobs and demand for blue-collar skilled workers, and instead has led to an escalation of demand for low wage jobs. Labour migration from the global south in a post-globalization economy thus often constitutes low wage service sector jobs which are paid minimally, are oppressive and come with no labour protection. Though the conditions of indentured labor was distinctly different from labor migration today, yet the structures of inequality, labor exploitation, racial and gender discrimination that define the expatriate experience of low wage, undocumented laborers overseas often echo the discriminatory structures of the indentured system and point to the power hierarchies of global capitalism.

Significantly enough, studies on South Asian literature on the diaspora have long been silent about the experiences of these non-elite diasporas. Canonical South Asian diasporas fiction and films have primarily engaged with the anxieties and tribulations of a particular elite immigrant experience-- the economically successful, highly educated, technically skilled professionals constituting the model minority image--whereby the conversation in canonical diasporas cultural texts is primarily focused on the issues of cultural crisis even in a context of economic affluence and citizenship security, like in Jhumpa Lahiri's *The Namesake* centres around the gender anxieties of the second generation affluent *desi* who clashes with more traditionally bound parents like in Grindler Chaddha's *Bend It Like Beckham*. Consequently, scholarship on South Asian diasporic literature and culture have primarily engaged with the elite diasporic experience, discussing at length the issues of homeland, memory, cultural duality, hybridity and generational anxieties of an expatriate experience—but one that is above the other materialistic issues of the low wage labour diaspora concerning bureaucratic harassment, inhuman living conditions, and economic exploitation, along with cultural and religious racialization as well. With the dominance of transnational capitalism that followed the post-cold war turn to economic neoliberalism as well as ethnic othering that has followed the contemporary discourses on war on terror, stringent border controls, more contemporary narratives on globalization have shifted from the euphoria of cultural globalization and utopian cosmopolitanism to revive the political construct of the state as a "ground" for political struggle in globality. As numerous literary texts imagine the postcolonial nation state as a political refuge against the repressive forces of globalization, the 21st century "return to home" novels of writers like Hamid Mohsin, H.M Naqvi, Benyamin, Kiran Desai, Amitav Ghosh and others as represent the continued significance of the nation state as a site of refuge and resistance against globalization.

For the contemporary Pakistani 'return to home' novels, the disillusionment with the global metropolis of the West is predominantly a product of the post 9/11 Islamophobia and theidentarian politics that Muslims have been subjected to globally. Pei-Chen-Liao organizes his reading of the new diaspora on the central trope of 9/11, arguing that "by reading these novels as examples of world literature, I argue that South Asia, diaspora, and the uncanny enable us to arrive at a more complex conception of the world and global belonging in an age of globalization and to rethink the questions of violence and identity in the post-9/11 era." The most obvious example of this genre is Hamid Mohsin's *Reluctant Fundamentalist* that traces Changez's journey from the alleys of the Wall Street to his return to Lahore. A stellar student at Princeton University, a successful employee at a prestigious financial firm and living in the heart of cosmopolitan New York, Changez seems to be living the perfect American dream that flattens out his ethnic, religious and national identities in a capitalistic utopia. Though Mohsin reveals a less than perfect world for Changez—Erica's father's gross stereotyping of Pakistanis being a case in point—Changez complacently settles in the skin of his American identity---as he terms it as "a semi-hypnotic gaze" (157) till things shake up after the 9/11. While it is the surge in public Islamophobia that alienates Changez, reducing him to his quintessential religious identity, his disillusionment with America's neo-colonial empire takes into purview the dual forces of both capitalism and war on terror, making him lean more towards his Pakistani, Muslim self. His return to his homeland is a political decision that goes beyond the personal grief of losing Erica, and the national boundaries of the state of Pakistan provides him with a tangible platform for anti-American dissent. Working with his local community, Changez's nation-bound life offers him more social and intellectual fulfilment than his diasporic one.

In the same manner, the sovereign political body of the state becomes both a refuge and a site of safety for Chuck in H.M. Naqvi's *Home Boy*. Chuck's brush with the post 9/11 anti-Muslim aggression in America is however more haunting than Changez. Though both protagonists follow the same trajectory of American assimilation—Chuck too is an English speaking graduate working on Wall Street—Chuck experiences the violence of Islamophobia in America on a more harrowing level. Beaten up, detained, physically abused and denied of the basic human rights due to his religious and national identity, Chuck goes through a spectrum of experiences that cement him as the "other" to the American society. Chuck thus comments on the splintering of the homogenous American identity into different forms of the other: "We'd become Japs, Jews, Niggers. We weren't before. We fancied ourselves boulevardiers, raconteurs, renaissance men" (1). Like Changez, Chuck's disillusionment with the American dream is not pertained only to the realm of cultural discrimination; as the neoliberal capitalistic market pushes him to economic precocity, Chuck bears testimony to the debilitating effects of the neo-colonial forces of globalization, bringing him to acknowledge the urban working class of New York largely consisting of illegal immigrants from erstwhile colonies. Scarred for life, Chuck leans to parochial identity markers as a process of "resistance identity"(Castells 7-8);his growing affiliation for Islam and Pakistan over his cosmopolitan state of being culminates in his decision to return for good. Though affected personally with the disenchantment of the myth of diasporic assimilation, the protagonists in the two novels portray a larger political consciousness about Islamophobia, Western bigotry and more

specifically, the American hegemony in a post-globalized world. Subsequently the nation state left behind offers new possibilities of resistive existence.

If the return-to-home novels on Pakistani protagonists largely hinge on issues of the global reach of Islamophobia, a number of Indian novels on the same expose the bleak underside of global capitalism and the pitiable lives of illegal immigrants. Kiran Desai's *The Inheritance of Loss* and Benyamin's *Goat Days* deserve specific mention here. Both Desai and Benyamin shatter the aura of emigration as a utopic passage into affluence and liberty, revealing the dark, ugly visages of labour exploitation. Biju in Desai's *Inheritance* holds a job in America as his father proudly declares to all, and yet a narrative shift to Biju's world reveals precarious lives that thrive in the basements of the dazzling commercial establishments in the heart of the Western cities. Biju's American dream lands him among the global expendable labour in the Euro-American metropolitan centres, teeming with illegal immigrants from poor former colonies who hang on the edge with menial jobs and inhuman living conditions. Biju describes his shelter through metaphors of disorderly proliferation, revealing an alternative dystopic space that teems with the dregs and exclusions of the global economy: "men camping out near the fuse box, behind the boiler, in the cubby holes, and in odd-shaped corners that once were pantries, maids' rooms, laundry rooms, and storage rooms...the men shared a yellow toilet; the sink was a tin laundry trough." Calling his kind as the "shadow class", Biju describes the precarity of an entire band of illegal migrants who endlessly float around in the economy and in the urban space, exploited and disposed of, yet unable to form any coalitions. While his father basks in the glory of his son being an expatriate, Biju's deplorable condition takes a brutal toll on him, damaging him both physically and emotionally. Broken beyond recognition, Biju seeks refuge back in his homeland. He trades his savings for a ticket back home, making the bold plunge to "go back" without any hope for return. The final meeting scene between Biju and his father metaphorizes a resolution to the multiple conflicts that strain the narrative: "The five peaks of Kanchenjunga turned golden with the kind of luminous light that made you feel, if briefly, that truth was apparent (324). Biju's return to his homeland thus gives order to the otherwise disorderly world of Desai's novel, bringing home the truth to a final resolution.

For Benyamin's protagonist Najeeb Muhammad too, emigration turns into a nightmare he strives to escape. Based on a true story, Benyamin's *Goat Days* (translated from Malayalam) portrays the horrifying ordeal of Indian labour emigrants to the oil-rich Middle East. Najeeb pays handsomely for a work visa to Saudi Arabia, hoping for better economic prospects abroad than what his sand miner's job could bring in the village. However, the reality that he confronts after landing there dispels all myths about the privilege of the expatriate class. Najeeb is sent off to a remote farm in the desert and made to work as a slave labourer tending to the herds of animals. Denied basic rights, Najeeb desperately holds on to the bare minimum means of sustenance that reduces his existence to no better than the animals he attends to. Trapped and tortured in a hostile land, the desire to return to the homeland culminates as a coveted, yet impossible dream. Visions of the homeland as a romanticised, utopic place of comfort and emotional solace thus haunt Najeeb in sharp contrast to the bleak reality he encounters. Desperate for return, Najeeb makes several failed attempts to escape till he finally succeeds to break free, undertaking a painful, dangerous journey to the Indian consulate with the hope of getting deported. Thus homecoming amends Najeeb's three years long ordeal of suffering, bringing him back to a safer, more emotionally secure sense of belonging. Najeeb's plight not only highlights the dreadful face of transnational labour migration prompted by the open labour market of global capitalism, but also projects the nation state as an asylum against the onslaught of global forces. No matter how far they wander, the homeland remains a haven of safety for the subaltern migrants like Biju and Najeeb.

Apart from these narratives of restitutive homecoming triggered by tales of personal trauma, novels like Sonora Jha's *Foreign* and Amitav Ghosh's *Hungry Tide* foreground extrapolated socio-political concerns that are prompted beyond the realm of the personal. Both novels take up environmental concerns affected by the forces of globalization, presenting the protagonist's return as a part of resistive solidarity with the local activism. For the American born Piya in Ghosh's *Hungry Tide*, a short trip to collect research samples from the Sunderbans turns into her decision to permanently return among the local impoverished community that has become inadvertent victims of global conservation policies. While Piya initially sides with the dominant narrative of global conservation prioritizes wildlife over human settlements, she gradually realizes of the near-sightedness of sweeping conservation policies that take a toll on the local, dispossessed communities like the Bangladeshi refugee settlers brutally evicted. The change in Piya's perspective from a global to a local one prompts her decision to return and work in solidarity with the local activists like Mashima. Along similar lines, the young American Kabir's journey back to India in Sonora Jha's *Foreign* is an essentially political gesture of resistance against the debilitating effect of genetically modified crops on the farmers of rural India. What initially began as a search for his biological father for Kabir culminates into a sort of environmental activism that resists the epidemic of debt-ridden farmers' suicides in Vidarbha. Both the novels resolve not only with the trope of return but also the optimism with which the protagonists pledge to continue their strife against the exploitative forces of globalization. At some point, both Piya and Kabir reject their transnational status for a more locally bound position, with the nation-state forming a powerful site for anti-globalization resistance.

An overarching trope that emerges in the contemporary homecoming novels is that a transition from diaspora to transnationalism—of the diasporic consciousness of unbelonging being significantly replaced by a transnational identity of co-belonging, with strong ties with the country of origin. Michel Bruneau succinctly points out the difference between diaspora and transnationalism:

A Diaspora has an existence of its own, outside any state, it is rooted in a strong culture (religion, language, etc) and a long history; it has created and developed its community and associative networks. The transnational community on the other hand arises from the migration of workers who retain their family base in the nation-state from which they have come, and they travel between this base and one or several countries where they have settled. They retain a strong anchorage in the place of origin, as well as citizenship or institutional links with their country. In a diaspora, this anchorage and any strong links have often disappeared following a catastrophe, or they may have been entirely re-shaped over time. The transmigrant is far too dependent with on the nation-state from which he originates as well as on the state in which he has settled to become autonomous and creative in the manner of a member of a diaspora.

The diasporic consciousness entails a sense of unbelonging, or as Edward Said puts it, a sense of being “in exile with the world”. Themes of rootlessness have been a staple archetype in older South Asian diasporic narratives, as I discuss above, grappling with the trauma of displacement. In contrast, the diverse homecoming novels is their narrative resolution with the rhetoric of belonging. The new wave of writing on emigration (and not diaspora) thus foregrounds i) a focus on the migrant than the diasporic, through ii) a predominant trend of return narratives that hinge on iii) a political discourse of resistance against the forces of globalization iv) worked out against the locally bound site of the nation state.

With the initial euphoria about globalization settling down by the end of the 20th century, the nation state is reimagined in these writings as both relevant and necessary, particularly in the postcolonial context. Embodying a wide spectrum of roles--from being a political asylum against violent stereotyping, to a refuge against exploitative global networks, to a site of collaboration and powerful grass root resistance---the nation state resurges as an important recuperative trope in narratives of expatriation. The resurgence of the state as a viable political site in the era of globalization is intricately associated with its entrusted democratic function. The nation state, as James Goodman and Paul put it in sync with many other political thinkers like Stephen McBride, Evan et al, Panitch and Pheng Chea, “once reined back under the control of its citizens the nation state can regain its role as the key site of local resistance to powerful globalizing forces” (75). Though hugely contested—the counterargument being that in this perspective, globalization is seen as solely a ‘foreign intervention’ and hence the destructive forces of nationalism are absolved of their damage---the idea has found popular resonance among several anti-globalization activists. The literary imagination of the resurged nation state too is not essentially a eulogy for the golden days of the premodern, nation-bound world. Mohsin’s *Pakistan* is far from being a utopia—it is divisive and hierarchical in terms of socio-economic privilege; moreover, a perpetual threat of war looms over it while it battles with the stock issues of unplanned urbanism, overpopulation, lack of amenities and rampant corruption that plague most South Asian nations. Similarly, along with a critique of globalization, Desai’s *Inheritance* also foregrounds a fatalistic picture of parochial nationalism—embodied in Gyan’s fanaticism for insurgency—that adds to the novel’s cynicism towards easy political binaries between the global and the local. No utopia, the homeland that Biju returns to throws him into a different set of challenges, instantly alienating him before he settles into his father’s loving embrace.

The flaws of the nation state are veritably exposed in Jha’s *Foreign* and Ghosh’s *Hungry Tide*—texts that deal with environmental oppression of the local communities. While global forces like the marketing of genetically modified seeds and global conservation policies are shown to play the main actors for wreaking havoc in the lives of the marginalised local people, the nation state—with its corrupt bureaucracy, capitalistic national policies, and utter oblivion of the marginalized sectors—is etched as a complicit participant in the oppressive process. Jha’s novel features a non-resident Indian woman, Katya, as its central protagonist. A single mother located in the US, Katya travels back to India in search of her missing son who has taken off in search of his father. What begins as a personal journey of bringing her son back becomes a journey of larger realizations about the violence of global seed companies and the Vidharbha suicides testifying the plight of the farmers. While Katya resolves her past wounds, and returns to USA to carry on the resistance from there, Katya’s son Kabir stays on in the village to participate in more grassroots activism. Kabir’s return is at once permanent and assertive of his choice to stay back within India to fight the dual forces of global corporate assault and the compliance of local power systems within the boundaries of the nation state. Piya in *Hungry Tide* remains a nonchalant outsider to the local affairs till her field trip reveals to her the detrimental effects of global conservation policies. While unmanned reserved forests for wildlife protection project the romance of a balanced, biocentric ecology, Piya’s brush with the local community reveals to her the ugly, underside of wildlife conservation in a densely populated, third world nation like India. Land for reserved forests—in accordance to the global policies of conservation— are grabbed at the cost of displacing the expendable, marginal communities of refugees as in the historical Morichjhapi incident detailed in the narrative. In Ghosh’s novel, the local population consisting of poor settlers struggling for bare subsistence are doubly marginalised by the global environmental policies as well as the state and the police. While global forces affect the environment and the local communities on a more comprehensive scale, the vagaries of globalization are executed by the local authorities within an immediate context. Thus, the polemic of *Hungry Tide* and *Foreign* point to a nation-bound resistance. Both the novels foreground a similar discourse of the homecoming of a diasporic protagonist, his/her encounter with environmental crises forged by the forces of globalization, and the consequent coalitions of resistance s/he builds up with the nationally bound local communities. Thus, for Kabir and Piya, the protagonists of *Foreign* and *Hungry Tide* respectively, the struggle is more against the immediate, tangible forces of local oppression than the invisible forces of globalism. In these immigrant fictions,

the home nation is no longer a mythical place constructed in the collective imaginary of the diasporic groups. It is a real, lived space of refuge, action and agitation, which the protagonist negotiates as part of his/her reconciliation with his/her past homeland. Consequently, the novels do not typically resolve with the diasporic protagonists' disillusionment with the state and their consequent movement back to the diaspora. Rather the new diasporic South Asian subjects return home not to grow wary of it and go back to the diaspora all defeated; Mohsin's Changez, Naqvi's Chuck, Benyamin's Najeeb, Desai's Biju, Ghosh's Piya, Jha's Kabir return with a resolve to stay, to negotiate with their roots, and to resolve issues at a grassroots level, and not to escape into the privileges of a diasporic status. While the South Asian homecoming novels of the 21st century do not essentially absolve the postcolonial nation state from its complicity with the forces of exploitation, they nevertheless imagine it as a democratic site of dissent and space for transnational coalitions.

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HUMAN RIGHTS - PHYSICAL INTEGRITY AND SAFETY

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Abstract: Human rights are the basic rights and freedoms that belong to everyone. The Idea about human rights has evolved over many centuries, but it achieved strong international support after the World War II. To protect the future generations from a repeat of War horrors, the United Nations adopted the Universal Declaration of Human Rights on December 10th 1948, it has set the fundamental rights and freedoms shared by all human beings. Physical integrity is the most deserved right among all fundamental rights by all human beings; it emphasizes the importance of personal autonomy and the self-determination of human beings over their own bodies. As per religious faith, human beings are made in the image of God, the body of human being is the temple of God, and it cannot be abused by any one or by any public or private institution. Though bodily integrity is afforded to everyone by their respective Constitutions, some of the vulnerable people like women, Children, poor and socially backward groups are more often affected by gender and ethnic based violence. These include Domestic abuse, Honour killing, Human Trafficking, Child abuse, Slavery Bonded labour, Custodial torture, death, Sexual assault, Discrimination and forcible Organ Donation. This paper is aimed at to describe various inhuman Practices and custodial torture on the vulnerable groups in Indian society and in some other nations; it also explains the functioning of Constitutional machinery in India such as Courts, Human Rights Commissions and Administrative Tribunals for the protection of physical integrity of the vulnerable people.

Key Words: Religious faith, Physical integrity, Vulnerable, Discrimination, Honour killing, Custodial torture,

Meaning-Nature: Human rights are the basic rights and freedoms that belong to every human being; these are the social conditions through which people can lead a better, happy and peaceful life. Rights are Universal they are applicable to all irrespective of their race, religion, creed language and gender. No one shall be subjected to discrimination, torture or to inhuman or degrading treatment or punishment. Gone are the days of might is right policy, in modern democratic countries the Constitutional machinery like judiciary and other commissions are responsible to safeguard the rights of people especially vulnerable people from the attacks and discrimination from the strong in the society. International organizations like United Nations Organisation, some of its agencies and NGO's are supporting and watching the way the elected governments are implementing and protecting the rights of the citizens in all the countries of the world.

Religion and Human Right: All the major religions in the world stressed upon the duties of people so that others can enjoy their rights. Christianity the world's largest faith says that Love your neighbour as thy self, help the sick, orphans, poor and needy. Quran says man is a Divine token visible symbol of invisible God. Hinduism, Buddhism, Jainism revealed the importance of justice which is the core element of rights.

Origin and Evolution of Rights: Rights are as old as human civilization they existed in the form of Natural rights but first documented Rights in ancient world are;

1. The declaration of Magna Cart by England to its people in 1215.
2. In 1264 AD the country of Poland declared few rights for Jewish people for protection from discrimination.
3. French revolution in 1789 is mile stone for rights, Equality. Liberty, Justice and Fraternity are the watch words of the people.
4. The American bill of rights in 1791
5. Greek and Roman bills on Natural rights
6. In India Mauryan rulers had given much importance to justice in administration

Modern Documents on rights

After two world wars the International organizations like UNO declared the rights to be implemented by the world nations to protect future generations from war and destruction.

1. In 1941 President of America Roosevelt declared "four freedoms"
2. UNO Charter in 1945 on October 24th declared rights for peace
3. Universal declaration on Human Rights in 1948 on 10th December, it contains 30 rights which are the bench mark for the basic rights of Modern Nations.

Physical Integrity: Physical Integrity means personal freedom and security, it is being able to live, able to move freely from place to place, to be secure against all kinds of violent assault. It is a right deserved by all human beings; it emphasizes the importance of personal autonomy and self-determination of human beings over their own bodies. As per religious faith human beings are made in the image of God, the body of the human is the temple of God, it cannot be abused by any one or by any institution. The very intention of man to start social life and the purpose to create political institutions like State, government and political parties are for personal integrity and for security. Though bodily integrity is afforded to everyone by their respective Constitutions, some of the vulnerable people like women, Children, poor and socially backward

groups are more often Discriminated and affected by gender and ethnic based violence. These include Domestic abuse, Honour killing, Human Trafficking, Slavery Bonded labour, Custodial torture, death, Sexual assault and forcible Organ Donation.

What is crimination?

Treating a person or particular group of people differently, especially in a worse way from the way in which you treat other people, or treating a person less favourably than another person in a similar situation is called discrimination which cannot be objectively and reasonably justified. Discrimination generally can occur due to Age, Gender, Race, Colour, Nationality and Disability. Civil rights movement by Martin Luther King in 1963 for Afro-American civil rights and movements against Racial Discrimination in South Africa by Nelson Mandela are some of the movements against discrimination and limited access to basic facilities. Discrimination unable the individual to see his best self so today every nation is concern of the promotion of human rights by eliminating discrimination; Today all the nations are guided by the International Bill of Rights. It includes the UDHR and two treaties the International Covenant on Civil and Political Rights and the International Covenant on Economic, Social, and Cultural Rights. These treaties elaborate on rights identified in the UDHR and, when adopted by individual states, have the force of law. Each treaty provides for independent experts who monitor governments and requires periodic reporting by governments to ensure that they are following treaty provisions. The following rights are in the Socio-political Convention which apply to every nation that has ratified the Convention.

International Covenant on Civil and Political Rights (**Personal Rights**)

1. Every human being has the inherent right to life. This right shall be protected by law. No one shall be arbitrarily deprived of his life. In countries which have not abolished the death penalty, sentence of death may be imposed only for the most serious crimes in accordance with the law in force at the time of the commission of the crime and not contrary to the provisions of the present Covenant and to the Convention on the Prevention and Punishment of the Crime of Genocide
2. No one shall be subjected to torture or to cruel, inhuman or degrading treatment or punishment. In particular, no one shall be subjected without his free consent to medical or scientific experimentation.
3. No one shall be held in slavery; slavery and the slave-trade in all their forms shall be prohibited. No one shall be held in servitude
4. Everyone has the right to liberty and security of person. No one shall be subjected to arbitrary arrest or detention. No one shall be deprived of his liberty except on such grounds and in accordance with such procedure as are established by law.
5. Anyone who is arrested shall be informed, at the time of arrest, of the reasons for his arrest and shall be promptly informed of any charges against him.
6. Everyone lawfully within the territory of a State shall, within that territory, have the right to liberty of movement and freedom to choose his residence. Everyone shall be free to leave any country, including his own.
7. Everyone shall have the right to recognition everywhere as a person before the law.
8. Everyone shall have the right to freedom of thought, conscience and religion. This right shall include freedom to have or to adopt a religion or belief of his choice, and freedom, either individually or in community with others and in public or private, to manifest his religion or belief in worship, observance, practice and teaching.
9. Everyone shall have the right to freedom of association with others, including the right to form and join trade unions for the protection of his interests.
10. Ethnic, religious or linguistic minorities shall not be denied the right, should allow to enjoy their own culture, to profess and practice their own religion, or to use their own language.

UDHR also identify a list of needs and facilities for all, they are:

- ✓ Right to marriage and family
- ✓ work and leisure (free choice of employment, just conditions of work, equal pay for equal work, just remuneration, freedom to form and join trade unions, and rest);
- ✓ a standard of living adequate for food, shelter, clothing, medical care, and social services;
- ✓ security in case of unemployment, sickness, disability, widowhood, and old age;
- ✓ special care and assistance in motherhood and childhood;
- ✓ education (free and compulsory elementary education, equal access based on merit, parental choice, and full development of the human personality);
- ✓ participation in the cultural life of one's community;
- ✓ protection of one's own literary, scientific, and artistic productions;
- ✓ social and international order that enables these human rights to be realized; and
- ✓ Ones duties to ones community.

Personal Rights of Indian Citizen: Personal rights of Indian citizens are called fundamental rights they contained in Part III of Constitution of India. It guarantees civil liberties such that all Indians can lead their lives in peace and harmony as citizens of India. These include (1)Right to equality (2)freedom of speech , expression and peaceful assembly,(3)freedom from exploitation and forced labour (4) Freedom of religious (5) Education and cultural freedom (6)the right

to constitutional remedies or Freedom to move to Courts for the protection of rights by means of writs such as habeas corpus, Mandamus, Prohibition, Certiorari and Quo Warrant. Violation of these rights result in punishments as prescribed in the Indian Penal Code or other special laws, subject to discretion of the judiciary. The Fundamental Rights are defined as basic human freedoms that every Indian citizen has the right to enjoy for a proper and harmonious development of personality. These rights universally apply to all citizens, irrespective of race, place of birth, religion, caste or gender. Aliens (persons who are not citizens) are also considered in matters like equality before law. They are enforceable by the courts, subject to certain restrictions. Though the rights conferred by the constitution other than fundamental rights are equally valid, their enforcement in case of violation shall be secured from the judiciary in a time consuming legal process.

Personal Rights in Some other Countries: In the Republic of Ireland bodily integrity has been recognised by the courts as most important right, protected by the general guarantee of "personal rights" contained within Article 40 of the Irish constitution. In *Ryan v Attorney General* it was pronounced that "'you have the right not to have your body or personhood interfered with. This means that the State should not do anything to harm your life or health. If you are in custody, you have a right not to have your health endangered while in prison. The United States Constitution does not contain any specific provisions However, the U.S. Supreme Court has upheld right to privacy, which protects rights to bodily integrity. Supreme Court has also protected the right of governmental entities to infringe upon bodily integrity. Examples include laws prohibiting the use of drugs, laws prohibiting euthanasia, laws requiring the use of seatbelts and helmets, strip searches of prisoners, and forced blood tests. In Canadian Charter of Rights and Freedoms defends personal liberty and the right not to be interfered with. However, in certain unique circumstances government may have the right to temporarily override the right to physical integrity in order to preserve the life of the person.

Physical Integrity-Different Forms of Violation in India and in other parts of the World

1. **HONOUR KILLING:** It is a traditional practice in India, Pakistan and in some Asian countries. As per this tradition own family members kill a family member who is believed to have brought shame or dishonour upon the family or community. The death of the victim is viewed as a way to restore the reputation and honour of the family. They consider family is more important than the individual, Reasons for these killings are refusing to enter into an arranged marriage, being the victim of a sexual assault, seeking a divorce, committing adultery and homosexuality are perceived as grounds for honour killing by relatives in few communities. Methods of honour killing include stoning, stabbing, beating, burning, beheading, hanging, throat slashing, lethal acid attacks, shooting and strangulation. The murders are sometimes performed in public to warn the other individuals within the community of possible consequences of engaging in what is seen as illicit behaviour. The main victims in this inhuman practice are girls and woman because they are vulnerable.

2. **Human trafficking:** It is the trade, sale and purchase of humans, most commonly for the purpose of forced labour, sexual slavery, or commercial sexual exploitation for the trafficker or others. This may encompass providing a spouse in the context of forced marriage, or the extraction of organs or tissues including for surrogacy human trafficking can occur within a country or trans-nationally. Human trafficking is a crime against the personal Rights coercion and because of their commercial exploitation. Human trafficking victims are mostly young women and children especially dalit women and girls are being trafficking due to poverty.

3. **Child Abuse:** Physical, sexual, or psychological maltreatment or neglect of a child or children, especially by a parent or other caregiver is called Child abuse. It may include any act or failure to act by a parent or other caregiver that results in actual or potential harm to a child, and can occur in a child's home, or in the organizations, schools or communities the child interacts with. Intentional use of physical force against the child that results in harm for the child's health, survival, development or dignity. This includes hitting, beating, kicking, shaking, biting, strangling, scalding, burning, poisoning and suffocating. Much physical violence against children in the home is inflicted with the object of punishing

Child sexual abuse (CSA) is a form of child abuse in which an adult or older adolescent abuses a child for sexual stimulation. Sexual abuse aimed toward the physical gratification or the financial profit of the person committing the act. Forms of CSA include asking or pressuring a child to engage in sexual activities (regardless of the outcome), indecent exposure of the genitals to a child, displaying pornography to a child, actual sexual contact with a child, physical contact with the child's genitals, viewing of the child's genitalia without physical contact, or using a child to produce child pornography. As per available data, approximately 15% to 25% of women and 5% to 15% of men were sexually abused when they were children. Most sexual abuse offenders are acquainted with their victims; approximately 30% are relatives of the child, most often brothers, sisters, fathers, mothers, uncles or cousins; around 60% are other acquaintances such as friends of the family, babysitters, or neighbours; strangers are the offenders in approximately 10% of child sexual abuse cases.

3. **Custody Violence:** custodial violence primarily refers to violence in police custody and judicial custody, .death, rape and torture are the forms of custodial violence, these inhuman practices are very much concern with the physical integrity of an individual, it has been on the agenda of civil rights groups for over three decades. The incidence of custody deaths demonstrates more undeniably the brutalization of the processes of law enforcement by the police and armed forces. The Universal Declaration of Human Rights prohibits capital punishment, enhanced interrogative methods are also increasing custody violence all over the world .In India in spite of sections 330,331&348 of IPC which prevents police men to torture in the name of extract information on the crime from the detained

people, ruthless bodily harm became common in police stations and in prisons on the people especially on vulnerable sections.

4. Religious Violence: Rise of fundamentalism in worldwide is a disturbing aspect especially the religious persecution on minority groups. Nazism and fascism were both ugly manifestations of religious persecution on Judaism where as in present days with rising protectionism countries are increasingly taking action against minorities to safeguard majority interests, some states follow religion as part of state policy and in many countries with the support of political parties in power fundamental groups are attacking and killing the minority religious people and destroying their properties. In India Christian preachers are being killed and persecuting by fundamental Hindu organizations like Bhajarang dal , Vishwa Hindu parishad etc, and in country like Myanmar(Burma) Rohingya Muslims are targeted by the majority so these minorities ran away for their life to other nations, they are living illegally with fear and without having proper identity and facilities.

5. Female genital mutilation

FGM also known as female circumcision is the ritual cutting or removal of some or all of the external female genitalia. The practice is found in Africa, Asia and the Middle East, and within communities from countries in which FGM is common, it is carried out by a traditional circumciser using a blade and unsterile things. FGM is conducted from days after birth to puberty and beyond. In half the countries for which national figures are available, most girls are cut before the age of five. Procedures differ according to the country or ethnic group. The practice is rooted in gender inequality, they can include recurrent infections, difficulty urinating and passing menstrual flow, chronic pain, the development of cysts, an inability to get pregnant, complications during childbirth, and fatal bleeding. There are no known health benefits of this tradition so there have been international efforts since the 1970s to persuade practitioners to abandon FGM. UNICEF estimated in 2016 that 200 million women have undergone some form of the procedure. 27 African countries, Indonesia, Iraqi Kurdistan and Yemen women have undergone the practice.

6. Euthanasia: The painless killing of a patient suffering from an incurable and painful disease or in an irreversible coma" which is called merciful death or mercy killing. It is also consider by few organizations as violation of physical integrity

Types of Euthanasia: Voluntary, non-voluntary and involuntary types can be further divided into passive or active variants.

(a)Passive euthanasia entails the withholding treatment necessary for the continuance of life.

(b)Active euthanasia entails the use of lethal substances or forces, (such as administering a lethal injection), and is the more controversial.

Besides the above, forcible organ donation and Lethal Dose (LD50) testing of pharmaceutical & drugs manufactures on the people are consider as violence against physical integrity of the people.

Constitutional Machinery for Protection of Rights: No one shall be subjected to abuse, torture or inhuman degrading treatment or punishment. The rights mentioned in the Socio-political Convention apply to everyone in the states that have ratified the Convention. Anyone who believes that State has violated their human rights they are not equally accessible to the basic facilities and needs as mentioned in the Constitution, as per Article 32 they can approach Constitutional machinery like, Courts, Human Rights commissions at state and national level. Victims must take a first step to have their case resolved in the state through SHRC and NHRC, if they think that their case has not yet been resolved, and then can take their case to the apex court (Supreme Court) which is the ultimate organ of the government to safeguard the rights and to render justice to the people.

National Human Rights Commission of India: The National Human Rights Commission (NHRC) of India is an autonomous public body constituted on 12 October 1993 under the Protection of Human Rights Ordinance of 28 September 1993. It was given a statutory basis by The Protection of Human Rights Act, 1993 (TPHRA). The NHRC is responsible for the protection and promotion of human rights, it has been accredited with "A status" by the International Coordinating Committee of National Human Rights Institutions (ICC), indicating that it is in conformity with the Paris Principles – a broad set of principles agreed upon by a conference of experts on the promotion and protection of human rights, in Paris in October 1991, and subsequently endorsed by the UN General Assembly. The Commission is thus entitled to participate in the ICC and in its regional sub-group, the Asia Pacific Forum, and may take part in certain sessions of the UN human rights committees.

The NHRC consists of:

- ✓ A Chairperson, should be retired Chief Justice of India (though GoI mulling appointment of retired SC Judges as chairperson
- ✓ One member who is, or has been, a Judge of the Supreme Court of India
- ✓ One member who is, or has been, the Chief Justice of a High Court
- ✓ Two members to be appointed from among persons having knowledge of, or practical experience in, matters relating to human rights

- ✓ In addition, the Chairpersons of four National Commissions (Scheduled Castes, Scheduled Tribes, Women and Minorities) serve as ex officio members.

The sitting Judge of the Supreme Court or sitting Chief Justice of any High Court can be appointed only after the consultation with the Chief Justice of Supreme Court

State Human Rights Commission: A State Government may constitute a body known as the Human Rights Commission of that State to exercise the powers conferred upon, and to perform the functions assigned to, a State Commission. There are 24 SHRCs working in India, SHRC and NHRC are the main constitutional machineries to handle the violation of human rights in the country besides the courts.

Functions of Human rights Commissions in India

Both NHRC and SHRC work to spread awareness among people about available safeguards for human rights. They conduct investigations, enquiries on the violation and negligence of human rights by the public authorities. Some times with permission of courts they intervene in court proceedings to protect human rights and give their recommendations. They promote human rights education and research and also encourage NGOs which are working for the protection of human rights. They submit Annual report to the president of India on their function.

Human Rights Mapping -Strategies &Steps

1. Human rights education must be promoted in developing nations especially in Asian countries to make people to learn respect for the dignity of others. The strategy for inculcating human rights culture among the people is to eradicate inequalities in the society.
2. HR education empowers the people to seek policies of good governance from the government and the knowledge of Human Rights makes the people to fight against injustice and exploitation.
3. Role of police personnel is crucial in custodial safety; they should be trained in matters pertaining to human rights and prisons management.
4. In the opinion the n of NHRC State human rights commissions should play a proactive role in improving the conditions in the prisons and health related facilities. Constant vigilance of NHRC and NGO would be able to address the problem of custodial death, rape and torture in Indian prisons and police stations. Strengthening the powers of national commission for SC and ST, NHRC, SHRC to protect the interest of the oppressed classes.
5. Government should encourage and support NGOs, working for the protection and upliftment of less privileged people in a backward villages, slums, Hamlets, agency and on hill areas.
6. Governments must forbid trafficking of human beings and forced labour (a crime) also protect cultural and educational rights of ethnic and religious minorities by allowing them to preserve their languages and to establish and administer their own education institutions.
7. When it comes to decision-making, the rights of one person often have to be balanced against the rights of others or against the needs of the broader community. Public authorities, who are delivering a service directly to the public or devising new policies or procedures, have an obligation to act in accordance with the Fundamental rights,
8. Human rights education and Understanding will help public officials to perform their day-to-day works as per constitutional provisions, ultimately help to establish SMART governance which is the aim of developing nations.
9. At present, the world nations focused on third generation rights like adequate living standards include right to clean and adequate water, food, housing and health facilities so the government and Public Authorities in India should focus and uphold, to implement these needs and services to the vulnerable sections without any discrimination.
10. It is the Obligation of every one on this planet to protect the rights of vulnerable by preventing violence, torture, discrimination &fundamentalism which are the threats for world peace and for human civilization..

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PATHWAY TO A DEVELOPED NATION - STUDENTS PERSPECTIVE

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Abstract: It is a well-known fact that India is one of the fastest developing countries in the world. But in the real scenario India is still in the verge of developing since several years. It is lagging behind in terms of technological development and various other aspects. In a country which is termed as “Young India” and the maximum population comprises of young generation, it expected to be more efficient in terms of technology and development. This research showcases a student’s perspective of a developed country and what steps can be taken by the youth of today to make our nation a developed nation. There are many who think of the reasons and causes of under developed economy which is very much needed but the most important thing is to put the thoughts into action to see the results. As young and potential citizens, the role of present young generation towards the development of the country plays a major role in taking the big step towards success. The focus of today’s youth is to study abroad and contribute to the GDP of other developed countries. It is important for this generation to contribute to the country’s GDP in order to set a better future. This paper shows the ways in which this generation is willing to contribute to the economy of the country and their definition a developed country. This study also provides the perception of the youth in converting the 3P’s i.e. Poverty, Poor education and Poor employment opportunities into the 3Q’s i.e. Quality of living, Quality education and Quality employment opportunities.

Key Words: development, youth, generation, GDP, education, technology, employment opportunities, quality, poverty.

INTRODUCTION:

A developed nation is one which has high GDP, high standard of living, superior technology and many other aspects. Such countries have negligible traces of poverty and poor standard of living. Developed countries are also known as First World countries, industrialized nations, advanced economies, and more economically advanced countries.

A developing nation is one which has low GDP, high population, obsolete technology and many such aspects. These countries are well known for their poverty and low standard of living. These nations are also known as less developed countries or under developed countries. There are many factors which determine whether a country falls under the category of developed nations or developing nations. Many of the developing nations like China are striving to become developed nations by adopting strategies like initiative to reduce the future population. The present scenario of developing nations in relation to quality of life can be termed as miserable.

Our country India is usually said to be one of the fastest developing countries in the world. However it is a fact that India is called as a developing country since many years but the progress in development is very minute or we can also say that it is negligible. As a country in which the majority of the population is comprised of youth, it is naturally expected to be more efficient and potential. It is right to expect in such a way as the young population has the energy, zeal, talent and adequate knowledge to contribute towards the development of the country. It is necessary to identify and place this talent in the right line in order to receive what a country needs. When such talent and energy is properly utilized then a definite change is noticeable. Our country is lagging behind in terms of GDP, quality of living, employment and poor education. There is one weakness of our country which can be turned as a remarkable strength and that is population. India ranks second in terms of population that means it has surplus of human resources, this surplus again consists majority of youth. Surplus human resource with energy, talent and potential can be used in order to make the future of our country better. The problem of negligence arises due to lack of proper education and employment opportunities. The youth of today can contribute to the development of our country in various ways by considering the loop holes of the country’s development strategy. New innovations, startups, improvement in education opportunities, initiative career development programs are few of the examples through which our youth can step ahead in joining hands for a better tomorrow.

OBJECTIVES OF THE STUDY:

- To analyze the contribution of youth towards a secured future
- To understand the loop holes of India’s development strategy and overcome them
- To study the students perspective of a developed nation
- To determine the conversion of the 3P’s i.e. poverty, poor education and poor employment opportunities into 3Q’s i.e. quality of living, quality education and quality employment opportunities.
- To consider the views of young population for a better tomorrow

SCOPE OF THE STUDY:

- This study covers only the young population who are basically students.
- This study covers the geographical area of Telangana state only.
- It considers the general perspective of an individual towards the development of India.
- It covers aspects such as poverty, unemployment, quality of life etc.
- It determines the willingness of a student to take a step towards success of the country and a better future.

LIMITATIONS OF THE STUDY:

Time constrain – limited to a period of one month
Geographical restriction – this study is restricted to the students studying in the universities of Telangana and Tamil Nadu.
The sample size is limited to
It is a broader scene of a student’s perspective of a developed nation

FINDINGS AND SOLUTIONS:

According to students, better education system and better employment opportunities determine their view of a developed nation(see fig1.1) where as political stability and high standard of living does not majorly influence their perspective of a developed nation.

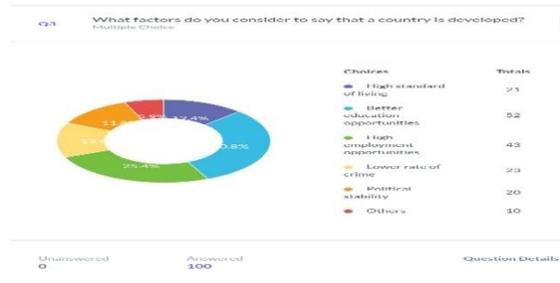


FIG1.1

For the young generation absence of poverty and quality life ensures a better future. For these people, luxurious life is of least importance as their focus is on having assurance of living a quality life.

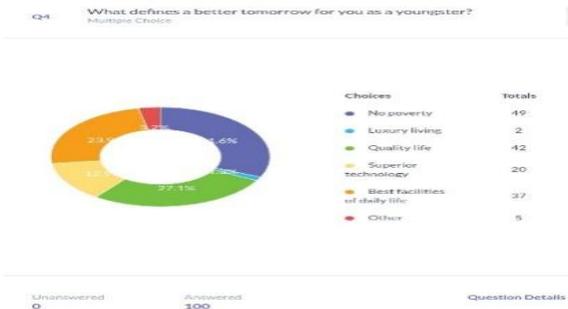


FIG 1.2

Most of the young people mention that unemployment and inequality are the main reasons for a country to still be a developing country and not a developed country. Other reasons like low income and poor healthcare are secondary reasons.(see fig1.3)



FIG 1.3

Major contribution of a student or youth towards the development of the country is through creating better working opportunities. Student initiative programs and getting employed in Indian companies are also some other contributions.

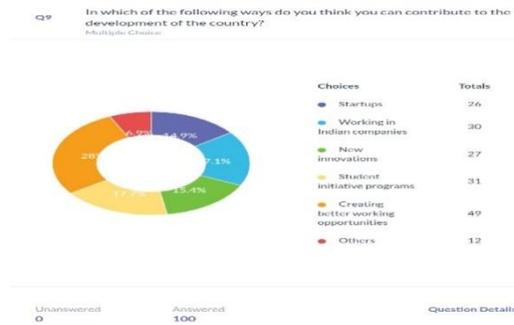


FIG 1.4

In terms of employment opportunities majority of the youth believe in creating their own employment opportunity. 53% of the youth believe in creating their own jobs if they don't find one. This is a major step in which a person can contribute towards the development of the country. (see fig1.5)

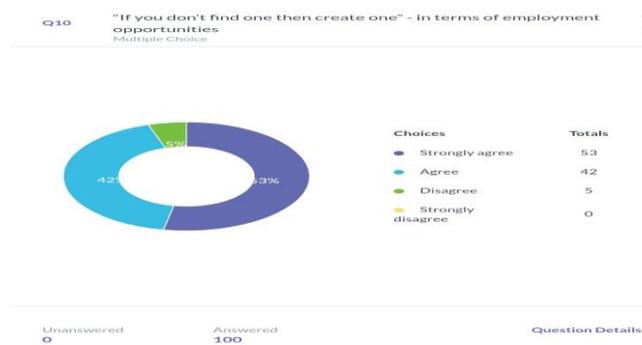


FIG 1.5

86% of the students are willing to contribute to the development of our country in one way or the other. As there is a saying "where there is a will there is a way".

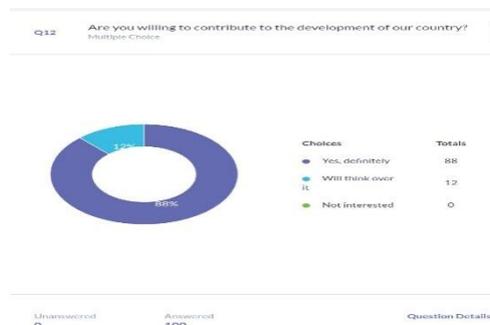


FIG 1.6

From all the primary data that is the information collected through the questionnaire method, the primary reason why our country is still developing is that there is inequality in the country. When there is proper placement of knowledge, talent and skills there will be definitely an improvement in the availability of jobs which will eradicate the problem of unemployment.

SECONDARY DATA:

There are certain factors which determine whether a country is developed or under developed or developing. The following are the characteristics of developing or under developed nations:

General Poverty: Developing countries are poor. By definition, GDP and Per Capita Income are at low level. General living standard of people in these countries is very slow. Poverty is visibly disturbing every aspect of life. According to International Monetary Fund World Economic Outlook (October-2016), GDP (nominal) of India in 2016 at current prices is \$2,251 billion.

High Dependence on Agriculture: Agriculture is the main occupation in developing countries. More than 70 percent of active labor force is engaged in this primary sector. Population increases and the increased labor stick to agriculture thereby over burdening the firm size. There is low output per head.

Underutilized Natural Resources: Most of the developing countries are rich in natural resources. However, their exploration and exploitation is limited. Sometimes, foreign companies control them. Generally, raw products are exported at low prices.

Lack of Capital and Technology: Capital deficiency is another common problem of developing countries. Because the countries are poor, they save less which results in low capital formation. They possess less investment capital. In addition their existing technology is old and unproductive..

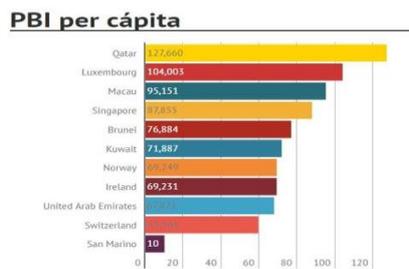
Demographic Characteristics: There is high growth rate of population in developing countries. It is as high as 3 percent per annum. Current population of India is 1.34billion.

Socio-cultural Characteristics: Different kinds of social groups reside in a country. They differ in terms of religion, castes, and creeds, cultures and customs, languages and beliefs, etc. Such social and cultural values have deep impact in the economy of a nation, Developing countries barbour may discordant social patterns in their economic life.

Now, lets see the characteristics of a developed nation:

Economic development: An economy is considered to be developed when it has high levels of economic growth and financial security.Among the factors most accepted for determining the economic strength of a country are the GDP per capita , Which represents the total gross income of an economy divided by the number of inhabitants of the country.

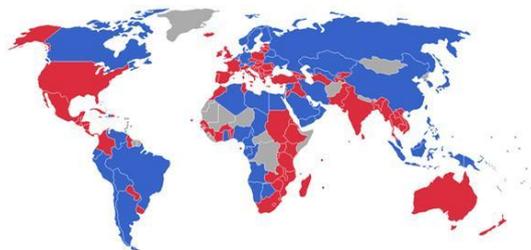
The United Nations (UN), in its global economic report, establishes, in addition to developed economies, developing and undeveloped economies. But as the report points out, the classification that only considers the economic aspect will not reflect the complexity of measuring the development of countries.



The 10 countries with the highest GDP per capita in the world. Source: International Monetary Fund.

Industrialization and foreign trade: The level of industrialization of the country will be higher as it depends less on agricultural activity to survive.Those countries that can generate greater added value over their natural resources and raw materials will reach a higher level of industrialization, and therefore of development.The trade balance represents the difference between imports and exports of each country. It gives us information about the commercial flows of each one. A country will be more developed to the extent that it has a balanced or profitable trade balance.

This will happen when the level of exports is equal to or higher (surplus) at the level of imports. Otherwise we will have deficits, that is, we import more than what is exported. On the other hand, it will be necessary to observe the trade and financial agreements in which each country is a member.

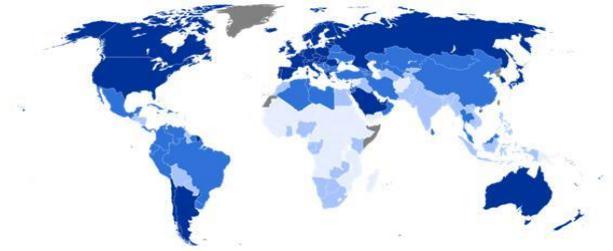


Trade balance at the global level in 2006. In blue the countries with surplus and in red the countries with deficit. In gray without data. Source: CIA factbook, CIA.

Political stability: Another reliable index, developed by the World Bank, is the IGM (Global Governance Indicator). Its elaboration includes data on political stability, absence of violence and armed conflicts, government effectiveness, respect and quality of laws, transparency and possibility of dialogue on the part of the citizens.

Health and education: Since 1990, the United Nations Development Program (UNDP) has developed the Human Development Index (HDI).In terms of health, the life expectancy index at birth is considered. This value reflects the

possibility that the inhabitants of a country have a long and healthy life. Regarding education, the average number of years of schooling that citizens possess is established, to reflect their ability to incorporate knowledge and knowledge. Income is calculated on the basis of GDP per capita.

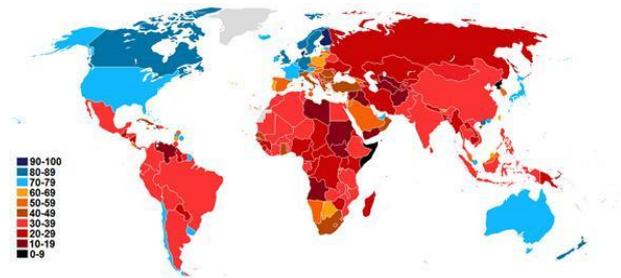


Human Development Index in the world 2017. The color blue is more intense as the rate of development of each country increases. Source: 2016 Human Development Report, UN.

Social equity, gender equality and low levels of poverty: For some years, the HDI considers other values to understand human development in an integral way. The level of equity between the different social classes and between the two sexes is measured. The percentage of women empowered in society is also investigated and the extent of poverty among the population is analyzed, taking into account their multiple dimensions.

According to the latest report published by the United Nations, the five countries with the highest human development index are: Norway, Australia, Switzerland, Germany and Denmark. In Asia the first place is occupied Singapore, in America the honor is of Canada, whereas in Africa the Seychelles Islands occupy the first position.

Scarce corruption: The political situation is also key to determining the development of countries. First, good governance by governments should be considered as the pillar of the country's political welfare. We must also analyze the levels of corruption in the country, at different levels of government. Increased corruption undermined the governance of peoples and increased the current crisis of democratic representation in some regions. This is due to the growing distrust among citizens of those countries with high corruption cases. The lower this level, the faster the development of societies.



Index of Corruption Perception in the world in 2015. The higher the percentage, the lower the level of corruption. Source: Transparency International.

SUGGESTIONS AND RECOMMENDATIONS: As we have potential human resources in hand there is much to be done in order to encourage and motivate them to work for the benefit of the country. Little initiatives can create a major remarkable change in the society. The following are few suggestions and recommendations in order to get a secured tomorrow: There is need to motivate the students to use their talent to create a welcoming atmosphere for the coming generations. Little initiatives should be taken to educate the students that they can be the change and can make a difference. There should be proper guidance given to the students in relation with career opportunities. There should be talent identification programs in order to identify the individual capacities of the students and place them in the right fields instead of forcing the child to opt for a particular job.

CONCLUSION: As it is said “little drops make a mighty ocean”, the students and youth of the country can turn a country like India into a mighty developed nation. It is possible only when they are encouraged and properly guided. The youth of today focus on their career overseas as it is shown to them in such a way that career development is only possible overseas. This myth should be broken and it should be made clear that career development is possible even in a country like India if a little step of risk is taken with the bold zeal to make our country developed. The youth in this generation are having high potential and they are very talented but there is a loop hole called laziness, if they motivated and encouraged in a right way then they will definitely be shining stars and walk on the pathway to a developed nation. According to my research 86% of the youth are willing to contribute to the development of our country. This is really a very good number. This is “a pathway to a developed nation- student’s perspective.

THE AGING AND YOUTHFUL POPULATION - A PERSPECTIVE

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Abstract: In spite of both of them containing an interesting and pleasant smell, what would you choose if you were given a ripen mango and a green mango? A section of population may choose ripen mango while the rest may prefer the green one. It is purely based on the situation and the need, that is, one cannot constantly consume the ripen mango or the green mango, a balance between them has to be maintained. Both are widely consumed in various forms and holds its own importance. A mix in the consumption of both is what keeps the body balanced. This is a metaphor of the different nations and their population. A nation is defined not just by its name, but also the quality of population it possess. We are, time and again, reminded that age is just a number and one shall not limit oneself just because of a number being added to the age every 365 days, but is it true when it comes to contributing to the economic growth? This paper presents the impact of aged and youthful population on various spheres of life and nation such as dependency, economic growth, culture, work force and much more. This study is to understand the viewpoint of the general public with respect to the aged and youthful population and to have an overview about the impact concerning the age of the work force. The data provided in this paper will be a consolidated result of primary and secondary data. This study also aims at finding the reasons to have a balance between the mellow and fresh individuals and at providing constructive suggestions about the problems faced with respect to the different age structures. Not lose the sight of the fact that, the flavor of ripen and green mango is what keeps a body satisfied.

Key Words: population, youthful, aging, work force, dependency, economic growth, culture

INTRODUCTION:

A nation is defined not just by its name, but also the quality of population it possess. The population of a country is responsible for its present state of standards, as it is the population itself which drives the country ahead or pulls it back. People of a country are its major resource and by the rule of nature, optimal utilization of resources is necessary as what we have now, may not be the same in the future. Hence, the population shall be potentially utilized as a factor to reform the country. The population of a country is composed of various age groups contributing to the economic growth in its own way. Invention is recurrent in the era which we live in. It is, thus, important to keep it up with the generation and innovation for advancement and better standard of living. Greater part of the population is into the working force where they are constantly learning and developing themselves for a better tomorrow. The relationship of a teacher and a student is ideal, inspiring and in due course of time the student may turn into a teacher and spark the mind of the students just as his teacher did. This is what experience does. Similarly, the population is a mix of the youth and the aged. The experience, commitment and discipline which the aging population has, can be used for guiding the youthful population to face the future hurdles and from there, it might just keep passing on to the next generation. This kind of fellowship can be considered as a factor of taking the nation together and moving ahead.

No country can progress with just the aging population or the youthful population. A blend of skill and experience is required for shaping the future. The youth are good with technology and the latest trends. They also have the ability to create more jobs but the aging population have more experience and are helping to grow and stabilize the economy of a country. Youth matters but the age provides experience and it is the age which transforms a hardworking youth into a smart working youth over a period of time. A smart worker is a more valuable asset than a hard worker in today's era. It is necessary to facilitate the youth in nation building and at the same time, it is important to efficiently utilize the experience of the aging population. This study aims at reflecting the perks as well as the need for having a mix of population with respect to the age factor.

SCOPE OF THE STUDY: This study focuses on the budding and the veteran section of the population. In few developed countries, despite of having majority of aged population, the rate of productivity and growth is high; in few other countries, on the other hand, despite of having majority of youthful population, the rate of growth is at snail pace. This study tries to understand if age group is the real concern for a country to develop.

OBJECTIVES OF THE STUDY:

- To understand the perspective of the general public with respect to the age factor and contribution towards the nation.
- To learn opinion of the general public regarding the reliability element of the population.
- To identify the factors which determines the level of efficiency irrespective of the age.
- To explore opportunities for the aged group of population other than being a part of the work force.

METHODOLOGY: The world is a very large place to read and understand. It is, therefore, not possible to analyze the mindset of all the people in the world within a short period of time.

The data collected and interpreted for this study is through personal interview and questionnaire circulated to a small sample size around different parts of the world.

PRODUCTIVITY OF AN ECONOMY: Productivity of an economy equates to the standard of living of the people in that economy because high productivity results in higher rate of wages which motivates the workers and is followed by higher output produced by each worker which leads to the company doing well and in turn the standard of living is increased. The productivity is influenced by the availability of good tools, natural resources, technology and most important element is the human. Human being completes the cycle. It is the human who is capable of putting all these factors into the right use. In the absence of human, the above mentioned factors cannot operate on their own. It is the human himself who uses his skills and knowledge to turn the inputs into outputs which boosts the productivity of an economy. In a survey conducted with a sample size of 111, majority of the respondents feel that population plays a greater role in contributing to the economic growth of a country. As we know, the population comprises of various age groups and they hold a strong opinion about the age factor influencing the productivity of an economy. Where 82.8% of the sample are of the opinion that age contributes to the productivity, 17.1% of the sample do not agree to the fact that age limits a persons capability of contributing towards the growth of a country.

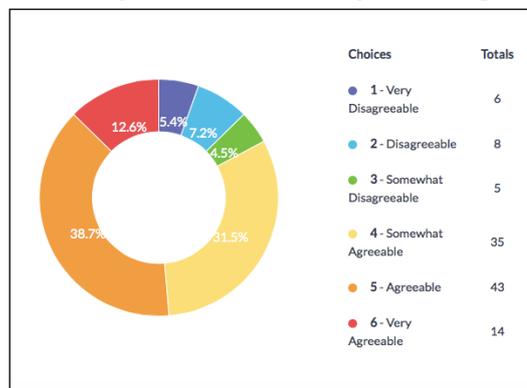
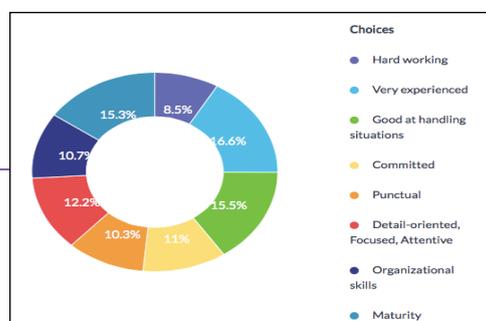


Fig.1 (Do you think age factor contributes to productivity of an economy?)

ELEMENT OF RELIABILITY: The sample strongly feels that age is not a factor which pulls down a person’s reliability. Certain portion of the sample feels that youth is fresh, energetic and willing to take up any task that is thrown to them. Youth have fresh ideas, filled with thoughts of innovation and always have a track of latest technology. The sample also feels that youth is very adaptable and the aged may be reluctant towards change. These features make us believe that the youth is determined and are not going to step back in any situation. Another portion of the sample feels that the aged are highly focused. They have seen the world and know the strategy to achieve their tasks. They feel that the aged population has experience and have worked under a lot of pressure because of which they have the ability to survive in any situation. The aging population know the value of time and money and hence, are punctual and disciplined. The features possessed by the aging population makes us believe that they are reliable.

But, does the age factor determine a person’s reliability?

The rest of the sample have a firm belief in the fact that the age cannot define the reliability of any person. Maturity and reliability complement each other and both are not dependent on the age factor. When working in a management, it is the well experienced population who manages the youth in all aspects, be it emotionally, physically or mentally. Though the youth is curious to conquer their tasks, so are the aged to achieve their targets. The aged have the experience and the youth have the willingness and determination. Experience, willingness and determination is what counts for the reliability of any person.



IMPACT OF AGE ON EFFICIENCY: The age of the sample ranges from 20 to 50. It is a collection of the working force and the students. Every respondent holds a great enthusiasm and are vocal about their opinion. As the sample has a variety of fresh ideas, skilled and experienced, let us see their take on the level of efficiency with respect to the youthful and aging population.

54% of the sample believes that jobs should be provided with respect to experience while, the rest feel that merit shall be the key to acquire a job. The sample agrees that the work furnished by both youthful and aging population is very valuable. Though 76% of the sample feels that youth have the capability to contribute better to the economic growth of a country, they do not deny the fact that a mix of both is very essential.

As per the sample, having new energy and being good with technology is important. Innovations happen in the blink of an eye, it is essential to keep up with the technology for advancement and better output. They are the solution to most of the problems, thus, a new energy and a new spirit will always be willing to work towards betterment of the world. The sample is also of the view that the youth being a young blood are filled with confidence and good communication skills which is required for the world of today because if you have the knowledge and are not able to put it across to the people or are not able to convince them then it is a loss for both the ends. The sample believes that youth come with a great zeal and new energy and are willing to work hard and prove that they are the best. This in turn helps the company and the economy to be competent and move ahead.

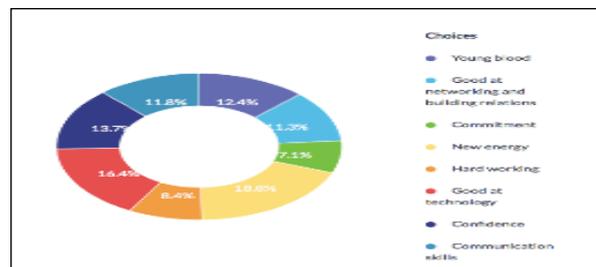


Fig.2 (Why do you think youthful population is efficient?)

The survey conducted also states that, according to the sample, efficiency of a population can be determined by their experience. The aging population is well experienced and hence, are good at handling any situation with their maturity and organizational skills. The sample is of the opinion that a person learns a lot with age and knows the value of money, talent, time and discipline, thus, a person who is experienced is very committed and punctual. They are focused and are very attentive as they constantly strive to produce the best and provide good results to the company which is again linked to the growth of a nation.

OPPORTUNITIES OTHER THAN MANAGEMENT WORK FORCE:

Neither age nor qualification is a barrier for contributing towards economic growth of a country. Due to the policy of the management, the aging population have a limit to work up to a certain age and are then, retired. Does this mean that the aging population cannot work towards the development of a country? There are many underprivileged who are not educated but, does that stop them from being productive? No. Majority of the sample support talent not being restricted to age and also that skills are more important than qualifications.

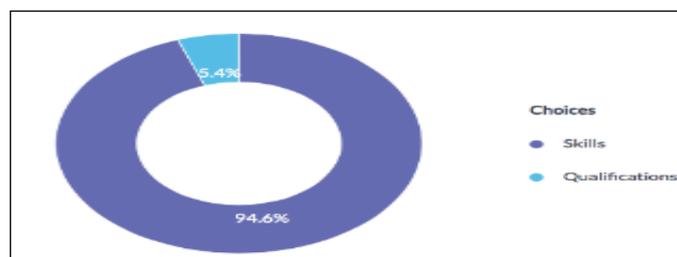


Fig.4 (What is more important?)

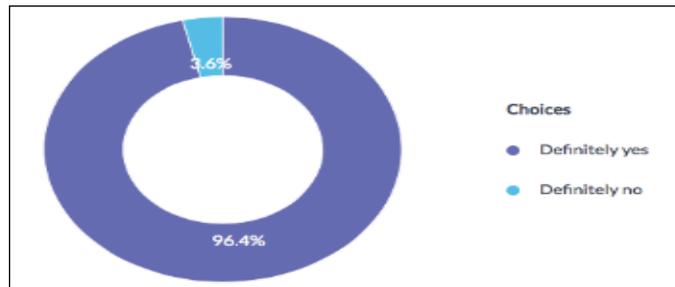


Fig.5 (Should talent be supported irrespective of age?)

There is no age to explore oneself from being an entrepreneur or consultant or anything and nothing can stop one to do that. But what one definitely needs is a support from higher authority to continue and expand their talents. Also, a support is required to inspire the rest with a message that age is just a word and it is all in our mind.

CONCLUSION AND RECOMMENDATIONS: Life is a never ending process of learning and it is never too late to correct oneself. Most of the times we are given an example of Colonel Sanders, the founder of KFC, saying that no matter how old you are, if you have a talent and if you are ready to bring it out and serve the people then nothing can stop you from doing so.

Age is not a factor which stops one from being productive and reliable but it is the lethargy and reluctance. Youthful and aging population possess spectacular qualities which is very much required in right combination.

This study states that, Government has a major role to play in supporting the aged population to explore their talents just like there are many schemes for supporting the youth. Because, until and unless a higher authority is involved, people with talent and willingness are not accepted.

The aged can start their own business. Also, with great experience which they have, they can guide the youth or become consultant. The aged population can contribute even when they are not working in a management. There is lot of hate in the world, the aged can start communities or spread awareness and share their personal experiences or guide advice, which is very much required for the youth to understand. On asking, if there is any ideal mix of population the reply was to have a balanced mix of both. Which section of population is more or less doesn't matter, what matters is their contribution and effective utilization of resources.

There is aged population who has faced many circumstances and have come out as winners, they can survive under any situation, they are focused and not distracted, they know they value of money and time, they are well experienced to deal with every aspect be emotional, social or mental. There is youthful population who has just started, they are fresh like a bud, they come with a new spirit and energy, they are willing to take up any task and perform their thoughts in solving them. The truth is that both youthful and aging population complement each other and nullify the odds of each other.

Just as how the kites are guided to fly with the help of the string attached to it, so is the youth who are guided to go ahead in life and be better for tomorrow with the help of the aged.

Remember, you can if you think you can, no road can go where you can't go.

NATIVE AMERICAN LITERATURE –VOICE OF THE MARGINALISED

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During the last two decades scholars of ethno-history have forcefully demonstrated that to understand American history one must include Native American literature .

Today my focus is on Native American Literature and the struggle they faced to uphold their culture and tradition. Even though there are nearly 560 federally recognised Native tribes in US, originating from every corner of the country they are reduced to artifacts and have become non-existent. “The media doesn’t show case their diversity and the google image search show how difficult it is to find an image of an indigenous American from before 1880” says one of the critics. How can they envision a future when they aren’t seen as alive .But not to forget that indigenous American is not only the past but also the present and the future.

The history of Native Americans record that these tribes lived in the laps of nature .There culture was different, civilization was less ,their skins were dark and their stories and beliefs were unique. They painted their faces and bodies and spoke a different language .The Europeans looked upon them as a savage race, war bonneted horsemen in buckskin or half naked Pueblo dancers .The whites felt that these people needed acculturation to be accepted by the white society.

Zitkala-sa-Bonnin a Native American writer ,editor ,musician, teacher and political activist who founded the **National Council of American Indians** in 1926, offered an account of hardships which she and other native Americans encountered when they were sent to boarding schools designed to civilize the Indian children .They were forbidden to speak their native languages and were denied to practice their own religion .They were forced to abandon their identity. In her book **The School Days of an Indian Girl** she described the deep misery of having her heritage stripped away. She confirmed that they were somewhat pitiful but eager to learn and better their situation .They were capitalised upon by Euro-Americans. The native Americans were mistaken as a savage race uncultured and wild who had no exposure to civilized living. They were constantly portrayed in a negative light in the novels and in the accounts of early settlers .In Mary Rowlandson’s book “ A Narrative of the captivity and Restoration of Mary Rolandson (1682) she describes the native Americans as hell hounds ,pagans, barbarous, savages and blood heathens . But there have always prevailed counter opinions of the writers and critics .The novelist and critic David Trever counters this in his record as he says that ...”the so called savages ...are in general strong ,agile and supple people...they strive after a sincere honesty ...cheat and injure none ...are both useful and loyal to their guests...” He also argues that ...”the native American writings should be judged as literature , not as a cultural artefact or as a means of revealing the mystical or sociological core of Indian lives , to non-natives.”He claims that the works of American Indian authors are often read as ethnographies when they should be read as literature. The genre in which most native American authors have written is autobiographical .This choice represents a break with oral tradition because they were fearful that their oral traditions would disappear. For even as their tribal communities became more and more fragmented under the demoralising conditions of unrecognised and exploited life put under the tag of reservation. At the time when most of the mainstream American writers such as James Fenimore Cooper (The Last of the Mohicans)1862,Catherine Maria Sedgwick (Hope Leslie)1827,and Henry Wardsworth Longfellow(Song of Haiwatha) 1855 were captivating audience around the nations,with the stories of bravery and struggle of the Indian Americans,(although Indian Americans were projected as the ‘dying breed’) native Americans had to work within the political environment that was hostile to their success .They struggled to make their voice heard.

Native American Literature is richer today due to writers like Gertrude Bonnin, Alexander Posey (a Creek), D’Arcy McNikle ,Angel Decora ,John M Oskinson (Cherokee) .They rigorously wrote on the core themes of 1) importance of religious rituals and beliefs ,2) Pride and Heritage ,3) Pain of Change 4) and the Loss of dignity. William Apess in “ **An Indians Looking Glass for the Whiteman** “in 1833 and Samson Occum’s” **A short Narrative of my Life** “1768 showed the readers that they were not a savage race. In “ **A son for the Forest** “ William Apess 1829 , describes his escape from early childhood by converting to Christianity. **Black Hawk**, author of ‘**Ma-ka-tai-me-she –kiakaik**’ 1833, reflects the condition of American Indians.The struggle that Black Hawk faced in voicing his beliefs paved the way for future American writers. **Elias Bandinot** a native American **Cherokee** , writes that the only way an Indian could survive was by acculturation .He supported the “Indian Removal Act”in 1800’s, authorised by **President Jackson** , which stated that all Indians could be removed to less desirable lands beyond Mississippi , which came to be known as the ‘**Trail of Tears**’ as there was massive loss of life in this physical movement .Bandinot was disowned by the tribal community for his support to the whites. Bandinot ,in his book “Address to the whites”, writes...”we have seen ...one family after another ...one tribe after another ,nation after nation pass away, until only a few solitary creatures are left to tell the sad story of extinction.” Nina Baym comments that where on one hand American Literature thematized –“The American Adam, the machine and the garden, American Romanticism, love and death-in American novels , on the other hand ,native American expressions were excluded as part of American Literature . It was when the second world war broke out , the services of native American warriors became a part of the fabric of American historical legend. Native American cultures underwent some change after their young men returned home because of their wide contact with the outside world.

It was during the late nineteenth and twentieth century, academics mostly anthropologists and historians took up the idea that native testimonies or life stories needed to be preserved. While some native Americans wrote their own autobiographies many more had their own life stories recorded in an effort to preserve their own culture and history for posterity. Some native Americans wrote the legends and folklores of their tribes as well as their own personal narratives. Writing became the means to perpetuate tradition in the face of cultural disintegration. As actual native presence visibly waned, public and academic interest in native testimony grew. Among them are Frankbird Linderman wrote 'Plenty Corps', 'Chief of the Crow', 'Pretty Shield, Medicine women of the Crow' etc. John G Nihardth : 'Black Elk Speaks', 'When the Tree Flowered'. N.Scott Monaday's book 'House made of Dawn' won the Pulitzer prize. Monaday has become an iconic figure in native American literature. He states that Native American literature has profound insight and expressions to uphold its reader. Mary Austin says that the power of Indian literary expressions and its point of view has little to do with the artistry of gifted individuals. She goes on to say that she reads native American literature to "hear the wind whistle through the pages, to feel the change of the seasons chapter to chapter, to note the shape of the changing hills in every line"... The mythologies of these indigenous people, comprise many bodies of traditional narratives. Their belief system is largely based in nature and is rich with symbolism, season, weather, plants, animals, earth, water, sky fire. It relates to the concept that all animals have soul and spirit that gives it supernatural powers. For the native American Indian, myth often starts with "before people came" or "when coyote was a man..." The way native American has been depicted in American Literature over last three centuries can show the readers a lot about the mindset of both native Americans and white Americans. Readers can see the prejudices of white Americans change with time. From the sub-servant status of a second class citizen just because of their ethnicity they proved themselves to be a culture based upon profound wisdom that is most certainly different from a western, rationalistic, secular perspective. Walter Benn Michael reveals how racial and cultural anxiety shaped American writers sense of national identity. Let me touch upon two Native American writers to elaborate on the voices of the marginalised.

BLACK HAWK: As I have mentioned about some leaders who fought for the protection of their rights and their land against the whites, I would like to throw some light on the struggles of **Black Hawk**, a leader of **Fox and Sauks** tribe. He fought for most of his life for the honour and integrity of his people. He was recognised by the whites for his valour and leadership among the tribes. In his autobiography, which he wrote later in life, he resists white cultural dominance. Black Hawks evokes and provokes patriotism in 19th century audience. He maintains that he was forced into war with the whites as his people were not given provisions in order to feed themselves. He argues that the attacks and the ensuing war was justified. In his autobiography he writes "my reason teaches me that land cannot be sold". "The great spirit gave it to his children to live upon. So long as they occupy and cultivate it they have the right to the soil". Black Hawk for his entire life fought for the land that he believed belonged to the people who lived in it and cultivated it. Black hawk is known for his honour and leadership among the native American tribes. He spent his entire life in his struggle for freedom. Though he is not the only iconic figure the tribals have seen. There are many of his kind and many who protested through writing and thereby revolutionising the movement.

ZATKALA-SA-BONNIN: Zatkala-Sa-Bonnin, born in 1876 on Yankton Indian Reservation South Dakota was abandoned by her father who was a white, when she was barely eight. Missionaries came to the Yankton Reservation, her homeland to take and train children of native Americans in their way, so that they could be accepted in the white society. She later wrote about this period in her works. "The School Days of Indian Girl". She described the deep misery of having her heritage stripped away. Zatkala gave her first speech in 1895 when she was awarded diploma and spoke on women's inequality. In 1900 she started writing articles on Native American life. Her books 'A Warriors Daughter', 'I am a Pagan', suggested that all their struggles against the whites failed as she acknowledges them to be a strong community. Their religion and culture was forced upon the tribals and they were not given right of citizenship unless they confirmed to their order. Her most influential piece was 'Oklahoma's Poor Rich Indians' -she joined SAI, a group which was dedicated to preserving the native American way of life. Zatkala was highly politically active throughout most of her adult life. She also supported 1920's movement of women's right.

MODERN DAY POSITION OF THE NATIVE AMERICANS: The conflict for rights, positions, identity and land goes on till this day. The recent build up is in North Dakota where thousands of native Americans have gathered. They are protesting against an oil pipeline that is meant to cross sacred burial ground and the Missouri river which is the main water source for the Standing Rock Sioux Tribe. Activists say that the Sioux Indians are under threat as the pipeline could also contaminate the tribal water source. After protesting from April onwards the tribe sued US Army Corp of Engineers to stop crews from burrowing beneath the Missouri river immediately upstream from the land. Many native Americans have been arrested as they pushed past barricades to block excavating machinery. The defiance evoked America's ugly past and present. Sherman Alex, a native American, tweeted that "it feels like 1875 because natives are still fighting for our land." He claimed that "the state has militarised our reservations." Several thousands of native Americans from around the country have gathered at Standing Rock to protest against the illegal acquisition of the land and the rights of the native Americans.

HARSH CONDITIONS BEING FACED BY THE NATIVE AMERICANS TODAY :

The situations faced by native Americans can be summed up in the points mentioned below. They have been victims of racism. These conditions have been very similar to the Black Americans, except they have not been much talked about.

Mass incarceration: they are over represented in the criminal justice system.

These communities are often impoverished and jobless.

The federal government is taking the land of the natives: members of the San Carlos Apache Nation in Arizona . They are fighting the sale of their sacred Oak flats site to foreign mining conglomerates.

The Kanaka Maoli in Hawaii are fighting to protect their sacred mountain Mauna Kea.

Exploitation of natural resources threatens Native Communities.

Violence against women and children is specially prevalent in native communities.

Education is failing : For Native Americans, at least, these disparities are in large part the result of inadequate federal funding, to the point where some schools on Indian reservations are deteriorated and structurally dangerous .

Dearth of Capital and Financial institutions in Native Communities: Indian nations do not own their reservation lands. Rather, the lands are held in trust by the federal government. This prevents Native Americans who live on reservations from leveraging their assets for loans, making it difficult for them to start businesses or promote economic growth in the area. The list is endless when seen in the light of the rights that should have been given to them.

Many tribes are still struggling to get themselves recognised so some monetary help might come their way.

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DEVELOPMENT IN RURAL AREAS: A CASE STUDY OF CHIEF MINISTER'S ADOPTED VILLAGE

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Abstract: India lives in its villages. Agriculture is the main occupation of rural areas. The rural population declined from 72.19% in 2001 Census to 68.84% in 2011 Census. As per 2011 Census, the total rural population of India is 83.3 crores. But the urban population has increased from 27.81% in 2001 Census to 31.16% in 2011 Census. The increase in urban population indicates lack of employment and other facilities in rural areas. So the central and state governments recognised the importance of rural development for economic growth of the country. The Government of Telangana is implementing innovative programmes not only to eradicate the rural poverty but also to provide better employment opportunities to the rural people. The Chief Minister (CM) of Telangana State, Mr. K. Chandrashekar Rao adopted two villages of Siddipet District and he is taking special interest to develop these villages as model villages for whole country in general and Telangana State in particular. At this juncture, the present paper aims to find out various developmental programmes which are being implementing in one of the adopted villages. The researcher has gathered primary data by observation, field visits and interaction with the Village Development Committee as well as the beneficiaries of the different schemes of the adopted village. The census details of the village are taken from the secondary sources. Hence the study is based on both primary and secondary sources. The study finds that all the prestigious government programmes like Mission Bhagiratha, Mission Kakatiya, Hariha Haram and construction of Double Bedroom Houses to the poor etc. are being implemented in the adopted village. Community farming and drip irrigation system have also been practicing as part of agricultural development.

Key Words: Rural development, Adopted village, Innovative schemes, Government of Telangana

Introduction: "I would say that if the village perishes, India will perish too. It will be no more India. Her own mission in the world will get lost. The revival of the village life is possible only when it is no more exploited." – Gandhi wrote in Harijan (29 August 1936)

"The state shall, within the limits of its economic capacity and development, make effective provision for securing the right to work, to education and to public assistance in case of unemployment and in other cases of undeserved want." – Article 41 of Indian Constitution

Development is nothing but growth or evolution or stage of advancement. In the context of rural background it means developing better physical, social and economic conditions of the population living in the rural area. Whatever the geographic location, culture and historical stage of development of a society, there are at least three basic elements i.e. life sustenance, self-respect and freedom are considered to constitute the true meaning of development. The main objective of development in all societies are given below.

To increase the availability and widen the distribution of basic life-sustaining articles such as food, clothes, shelter, health care and security.

To increase standards of living, provision of more jobs, better education and greater attention to cultural and humanistic values.

According to Gandhi every person should be provided with minimum necessities i.e. food, clothing and shelter. Gandhi is in favour of the self-sufficient village economy where the villages will be the independent economic units. According to Robert Chambers (1983), Rural Development is a strategy to enable a specific group of people, poor rural women and men to gain for themselves and their children more of what they want and need. It involves helping the poorest among those who seek a livelihood in the rural areas to demand and control more of the benefits of rural development. The group includes small scale farmers, tenants and the landless.

The main objectives of rural development are given below.

- Improvement in levels of living, including employment, education, health and nutrition, housing and a variety of social services.
- Decreasing inequality in the distribution of rural incomes and in rural-urban balances in income and economic opportunities.
- Increasing the capacity of the rural sector to sustain and accelerate the pace of those improvements.

Even though both central and state governments have been implementing many policies, schemes and projects for social and economic development of rural areas since independence, there are is a migration of youth from rural to urban area where there are more opportunities for the professional services as well as employment. Caste is thus gradually losing its traditional influence on the choice of occupation. Due to educational attainments and occupational mobility, joint family system is also gradually breaking. The rural society is undergoing social transformation. Most of the villages still face problems and also rural people feel themselves as a neglected lot when compare with better facilities of living and entertainment in towns and cities. In this context, the Government of Telangana has been implementing several schemes for the development of rural areas by focusing on agricultural development, which is crucial for providing employment opportunities in a large scale manner within rural areas. The government is aiming to bring 'Bangaru Telangana'. For reaching this goal, the Government

of Telangana has recognised the importance of rural development and came up with new scheme called ‘Gramajyothi’. Apart from this scheme, the Government of Telangana has been implementing some other prestigious schemes like ‘Mission Kakatiya’, ‘Mission Bhagiratha’, ‘Haritha Haram’, ‘Housing for the Poor’ and ‘Sheep Distribution’ for the development of rural areas.

To inspire others and to become a role model for others in rural development, the Chief Minister (CM) of Telangana State, Mr. K. Chandrashekar Rao has adopted two villages namely Erravalle and Narsannapet in the District of Siddipet. He wants to develop these villages as self-sufficiency in all the aspects. He says “Unity has the strength to even break a mountain. Erravalli and Narsannapet villages should set an example of unity, which should be an inspiration for the society to follow”. Finally he wants to develop these two villages as model villages for the entire country. In addition to all the government schemes, special schemes are also being implemented for socio-economic development of the people lived in these two villages.

Objective: The present paper “Development in Rural Areas: A Case Study of Chief Minister’s Adopted Village” is to find out various developmental programmes/schemes/projects that are being implemented in the adopted village of Erravalle.

Methodology:

To get possible answers to the research objectives of the paper, the researcher has visited Erravalle village for several times in the year of 2017. Observation method has been used one of the best tool to know the various developmental activities taken place in the village. To get primary data, the researcher conducted Focused Group Discussion with Village Development Committee (VDC) and beneficiaries of various schemes. The census details of the village has taken from the secondary sources. Hence the paper is based on empirical research.

Findings and Discussion: Erravalle village is one of the villages of Markook Mandal of Siddipet District. The area of the village is 1,111 hectares with 348 households.

Table-1 Demographic Profile of Erravalle Village

Particulars	Persons	Male	Female
Total Population	1445	717 (49.6%)	728 (50.4%)
Literates	680 (47.1%)	417 (58.1%)	263 (36.1%)
Population in the age group of 0-6	177 (12.2%)	82 (11.3%)	95(13.1%)
SC Population	555(38.4%)	290(40.4%)	265(36.4%)
ST Population	11(0.7%)	4(0.5%)	7(0.9%)

Source: 2011 Census

Table-1 indicates that female population is more in Erravalle village. Male literates are more than female literates. Around 12.2% of the population is in the age group of 0-6 years. Around 38.3% of the population belong to SC category and 0.7% of the population belong to ST category.

Table-2 Industrial Category of Erravalle Village

Particulars	Persons	Male	Female
Total Workers	749 (51.8%)	390 (54.4%)	359 (49.3%)
Main Workers	367 (49.0%)	289 (74.1%)	78 (21.7%)
Marginal Workers	382 (51.0%)	101 (25.8%)	281 (78.2%)

Source: 2011 Census

Table-2 shows that around 51.8% of the persons are working in which marginal workers are more. Males are dominating among main workers whereas females are dominating among marginal workers.

Table-3 Industrial Category of Main Workers

Particulars	Persons	Male	Female
Cultivators	136	132	4
Agricultural Labourers	110	55	55
Household Industry Workers	4	0	4
Other Workers	117	102	15

Source: 2011 Census

Table-3 shows that cultivators are more among main workers of Erravalli village. Other workers and agricultural labourers are also more among main workers. Household industry workers are very less in the village. In other words the village depends on agriculture for their livelihood.

Table-4 Industrial Category of Marginal Workers

Particulars	Persons	Male	Female
Cultivators	2	1	1
Agricultural Labourers	354	93	261
Household Industry Workers	9	0	9
Other Workers	17	7	10

Source: 2011 Census

Table-4 shows that agricultural labourers are more among marginal workers of Erravalli village. Cultivators, Household industry workers and other workers are very less in the village. In other words the village depends on agriculture for their livelihood.

Amenities of the Village before Adoption: The village has one Upper Primary School and one Primary health sub centre. The village people depend on tap for drinking water. The village has one hand pump and one overhead tank. One sub post office is there. Public Call Office (PCO) and mobile phone coverage is also there in the village. Bus service is available from Gajwel. Autos and carts driven by animals are also available in the village for transportation. The village connected with other district road. Self Help Groups, Public Distribution Shop and Anganwadi centre are also available in the village.

Development in Village after Adoption: Mr. Krishna, the Vice Chairman of Village Development Committee says “the CM of Telangana State, Mr. K Chandrashekar Rao has a farm at Erravalli village. So that he wants to develop the village. And also the two adopted villages are in Gajwel Assembly Constituency, from where he was elected. He wants to take care of his own village. He believes in not only construction of roads and houses but also economic development of people by using resources. He strongly believes ‘all for all’. He wants to develop skills of individual to stand on himself which is very crucial for achieving independency of villages.”

Agricultural Development: The village has four *kuntas*(tanks) called Erragunta, Lingarajukunta, Nallakunta and Maisireddykunta. All these tanks were developed through ‘Mission Kakatiya’ scheme, which are now having capacity of 0.5 TMC of water. The water will be used for irrigation purpose. Another new tank called ‘PandurangaCheruvu’ and two Check dams on the stream are being constructed in the village. Around 1800 acres of land is used for agricultural purpose. The main crops are Maize, Soyabean, Millets, Red gram and Bengal gram. Cultivation of cotton crop is not there. For all the fields water will be supplied by drip irrigation method, which is being maintained by ‘Metaphim’. Near to the ‘KoodavelliVaagu’ the drip irrigation system has set up. For operation of drip irrigation, the local unemployed people have recruited and they will be given salaries every month.

Cultivation of Paddy is also very less in the village. Cultivation of vegetables is encouraged in the village, which also consumable by the villagers daily. The Kaveri Seeds Company is procuring the agricultural production from the farmers by ‘buy back’ system. Telangana Seeds Development Corporation is also purchasing the production from the farmers. The agricultural land has been divided into 8 zones in which each zone has around 200 acres of agricultural land. One Chairman has to take care of one zone. He has to suggest farmers about the crops to be cultivated for each season, package of practices in general and fertilizer application in particular for different crops cultivated in his zone and bringing of tractor for various purposes such as tilling of the land and transportation etc. Most of the farmers are having land in between 2 to 3 acres of agricultural land. The AEO and the AO show special interest for agricultural development. They will give suggestions to the farmers by considering their views on agriculture. Crop loans are being sanctioned by the banks. 24 hours power supply is being given to the irrigation purpose.

In the year of 2016, the CM of Telangana State has distributed 18 tractors with implements to the landless families in the village. The Mahendra Tractor Company has given came forward to give tractors with 100% subsidy. It is one of the step to create self-employment in the villages. He strongly believes that individual benefits would be more by practicing community farming. As part of this farming system, he appointed operators for eight zones and one operator for one fertiliser godown. The employed youth belonging to landless and poor families, thus providing them livelihood. The zone operators should ensure that water from sump houses was supplied to fields through drip irrigation. The godowns are going to be used for storage of fertilisers, which can be procured in bulk from fertiliser companies and distributed to farmers to reduce the financial burden on farmers. He assured that the Godavari water would be used for irrigating the fields through Pamulaparthi reservoir (renamed as Kondapochamma reservoir). Vermicompost is also being prepared within the village. Around 66 units of sheep were distributed to the Yadava community.

Housing (Double Bedroom) Scheme: The village has around 348 households. There was a plan that all the 348 houses should be demolished and new houses should be constructed by the government. But very few families have not taken part of this scheme voluntarily and around 300 new houses (Double Bedroom) are being constructed by Meenakshi Constructions. Each house should be constructed in the area of 200 yards with all facilities. Two bedrooms, one hall and kitchen with toilet facility should be provided with enough open space. The land has been adjusted among the neighbours of the village for construction of new houses where there was a shortage of land for any family. As part of ‘Haritha Haram’, each house has given five plants i.e. Guava, Curry leaves, Lemon, Coconut and Rose. Two buffalos/cows, 10 country chicken were distributed to all the families. Woman is the head of the family in the village.

Infrastructural Development: Around 12 km of CC road has also sanctioned for all streets of the village. Solar power has been using for the domestic purpose. A four line metal road has constructed for 1km length within the village with central lighting system. Around 12 km length of underground drainage system has constructed in the village. It is an Open Defecation Free (ODF) village. For the purpose of conducting meetings, celebrating marriages and also for conducting training programmes, one 'Auditorium cum Community Hall' has constructed. Erragunta should be developed as like as 'tank bund' of Hyderabad. 'BathukammaCheruvu' is also being constructed near by the community hall.

In 2016, Telangana Grameena Bank has started functioning within the village and all the persons of two adopted villages opened their Savings Account in the bank. Cashless transactions are also going on in the village. One sub-station for electricity came into existence in the village from 2016. Internet facility is going to be provided by the Reliance. CC cameras are also set up in the villages. Drinking water will be provided through 'Mission Bhagiratha' scheme. There is a ban on selling of alcohol in the village.

Mr. Krishna, the Vice Chairman of VDC reminds the CM's view on shopping complex that the villages would have one-stop-shops for buying clothes and footwear and also a hotel, a market and few other stores which would be run by the landless and poor people of the villages by which local economy would become self-sufficient.

Buildings under Construction

The budget has allocated to the construction of the building in the village. The following buildings are being under construction at the time of data collection/field visits by the researcher.

Anganwadi centre, Library, Primary Health Centre, Children's Park, Upper Primary School, Grama Panchayat, Veterinary dispensary, Mahila Bhavan, Bank, Shopping Complex, Bus Shelter and Vegetable Market

Mr. Laxma Reddy says "Most of the parents are sending their children to government school only. For ensuring cleanliness in the village, colony wise committees has been set up. Village Development Committee (VDC) reviews the progress of the village and come with the new proposal for village development."

One member nominated by District Collector, MPTC, Sarpanch, two members from each caste and one woman from Self Help Groups are the members of VDC. The total members of the committee should be 25. The decisions taken by the VDC should be followed by the villagers. The Sarpanch acts as Chairman and Vice Chairman should be elected by the members of the committee and the District Collector is the in charge of the committee.

All the youth clubs were merged and only one youth club namely 'Bangaruvalli Yuvasena' has emerged. One meeting should be organized on 3rd Sunday of every month. Rachabanda is there in the village to solve the disputes among the villagers. Direct bus service is available to Hyderabad from the village.

The villagers want to set up an industry by the government so that most of the youth is going to be employed. Household industry should be promoted in the village for giving employment opportunities to the women. Based on the resources available in the village, the industries should be established. Boundary path should be constructed around the village. Literacy should be increased. Everybody should get employment. The government should release development fund to the VDC. The village should be developed as a model for self-sufficiency.

Conclusion: The Chief Minister of Telangana, Mr. Chandrashekar Rao says "Our villages need to become self-sustained and self-supported villages. We should forget any past enmity between us and work towards building healthy relationships." If all the villages will develop in this manner, the migration of the villagers to towns/cities will be decreased. Most of the amenities, which are available in the urban areas are provided in Erravalle village. The farmers are practicing community farming. It is an ODF village. Cleanliness has given priority by the villagers. The construction of the houses has successfully completed and the villagers are residing happily. Agricultural development is very crucial for rural development. Hence the CM has also focused on agriculture. The revival of tanks has done on war foot basis for increasing irrigation facilities. All the prestigious schemes of the Government of Telangana are being implementing in this village. Apart from this schemes, the CM takes special initiation and interest to develop the village in all aspects. Employment opportunities has provided to the landless youth within the village. By taking inspiration from the CM, some of the Ministers, MPs and MLAs of Telangana State have adopted few villages. But those villages have not achieved good results like this village. We have to search reasons for failure that whether the political commitment is lacking or villagers' commitment is lacking in those villages. Anyhow, instead of developing all the villages, developing only one village is a big question in a democratic country like India.

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PERSONALITY AND MUSIC PREFERENCES

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Abstract: This study explored whether significant differences in musical preferences existed among those characterized as being high and low on the Big Five dimensions. 160 young adults from the cities of Hyderabad and Chennai constituted the sample. The Big Five Inventory and the Short Test of Music Preference scale (STOMP) were the research tools used in this study. Gender differences were also explored. Significant Gender differences were found in the preference for Intense and Rebellious music and Energetic and Rhythmic music.

INTRODUCTION

PERSONALITY: Personality, as defined by Gordon Allport (1961), is the 'dynamic organization inside the person of psychophysical systems that create the persons characteristic patterns of behavior, thoughts and feelings'. Personality is generally viewed as complex, dynamic integration or totality, shaped by many forces, including: heredity and constitutional tendencies; physical maturation: early training; identification with significant individuals and groups; culturally conditioned values and roles' and critical experiences and relationships. Various theories explain the structure and development of personality in different ways but all agree that personality helps determine behavior (APA, 2007)

Guilford (1959) defined personality as an individual's "unique pattern of traits".

A trait is defined as a "neuropsychic structure having the capacity to render many stimuli functionally equivalent, and to initiate and guide equivalent (meaningfully consistent) forms of adaptive and expressive behavior" (Allport 1961)

A number of theories explain how personality develops. These theories have been influenced by different schools of thought in Psychology. Some of these major perspectives on personality include: Type theories suggested that there are a limited number of "personality types" which are related to biological influences. Trait theories viewed personality as the result of internal characteristics that are, to a large extent, genetically based.

Psychodynamic theories of personality are greatly influenced by the work of psychoanalyst Sigmund Freud. He emphasized the influence of the unconscious on personality. These theories include Sigmund Freud's psychosexual stage theory and Erik Erikson's stages of psychosocial development. Behavioral theories suggest that personality is a result of interaction between the individual and the environment. Observable and measurable behavior is studied. Behavioral theorists reject theories that take internal thoughts and feelings into account. Behavioral theorists include B. F. Skinner and John B. Watson. Humanist theories emphasize the importance of free will and individual experience in the development of personality. Humanist theorists include Carl Rogers and Abraham Maslow.

THE BIG FIVE: The emergence of the Big Five as a general model for describing Personality has been one of the most important developments in personality research. This model stems from the work of Cattell. It serves as a conceptual foundation for much of the contemporary work in Personality measurement. Several versions of the Big Five exist. Mc Crae and Costa (1987, 1989, 1990; Costa & Mc Care, 1988, 1992, and 1995) also identified a Big Five structure in a separate research program. They used the following factors: Neuroticism, Extraversion, Agreeableness, Conscientiousness, and Openness. Mc Crae and Costa have developed the NEO personality inventory to measure this structure. *Extraversion*- an orientation of one's interests and energies towards the outer world of people and things rather the inner world of subjective experience. Extraversion is a broad personality trait and like Introversion exists on a continuum of attitudes and behaviors. Extraverts are relatively more outgoing, gregarious, sociable, and openly expressive (APA, 2007) *Agreeableness*- the tendency to act in a cooperative, unselfish manner, construed as one end of a dimension of individual differences. (APA, 2007) *Conscientiousness* – the tendency to be organized, responsible and hardworking, construed as one end of a dimension of individual differences (Conscientiousness versus lack of direction) (APA, 2007) *Neuroticism*- Eysenck's polar opposite is emotional stability, chronic level of instability and proneness to psychological distress. (APA, 2007) *Openness to experience*- refers to individual differences in the tendency to be open to new aesthetic, cultural, or intellectual experiences. (APA, 2007) A **young adult**, according to Erik Erikson's stages of human development, is generally a person in the age range of 20 to 40 (Erikson, 1950) although definitions and opinions vary. The young adult stage in human development precedes middle adulthood. Despite the confusion about the timelines of young adulthood, there is broad agreement that it is essentially the twenties and thirties which constitute 'Early adulthood...the basis for what Levinson calls *the Dream*—a vision of his [or her] goal's in life which provide motivation and enthusiasm for the future' (Ann Birch, 1997)

MUSIC: "Music gives a soul to the universe, wings to the mind, flight to the imagination and life to everything."- Plato. Music is an art form whose medium is sound and silence. Music is a purely abstract art form, devoid of language or explicit ideas. Even though music says little, it still manages to touch us deep, to tickle some universal nerves (Lehrer, 2011). For many it is the natural happiness drug. Music fulfils three important psychological functions. Indeed, scientific research shows that people listen to music in order to: (a) improve their performance on certain tasks (music helps us combat boredom and achieve our optimal levels of attention while driving, studying or working); (b) stimulate their intellectual

curiosity (by concentrating and analyzing the music we hear); and, most importantly (c) manipulate or influence their own emotional states with the goal of achieving a desired mood state, e.g., happiness, excitement, and sadness.

A music genre is a conventional category that identifies pieces of music as belonging to a shared tradition or set of conventions (Samson, Jim 2012). In the current study, groups of Western music genres are classified into 4 music styles according to the Short Test of Music Preference (STOMP)

1. The Reflective and Complex music style comprises the Classical, Blues, Folk and Jazz genres of music.
2. The Intense and Rebellious music style comprises the Alternative, Rock and Heavy Metal genres of music.
3. The Upbeat and Conventional music style comprises the Country, Religious and Pop genres of music.
4. The Energetic and Rhythmic music style comprises the hip hop, rap and soul/funk genres of music.

MUSIC AND YOUNG ADULTS: For adolescents and young adults, music serves a cathartic function, aiding in expression and fulfillment of emotional needs. Even in adulthood, musical choices are made largely based on “mood- and emotion-optimization” (Konecni 1982).

“Adolescents’ quest for independence often takes the shape of a juxtaposed stance to the perceived ‘status quo’, that of parents and the establishment.” “Intense’ music, seen as aggressive, tense and characterized by loud, distorted sounds has the rebellious connotations that allow adolescents to stake a claim for the autonomy that is one of this period’s key ‘life challenges’.” (Rentfrow, 2003). There is a wide variety of music preferences in the general population due to the diversity in people (Hugh, 2000). Adolescents’ and young adults listen to certain styles of music that are unique to them probably because of the age they are at and the exposure to the styles of music they have at that age. For instance, most adolescents prefer rock to jazz and it’s vice versa for adults.

Music therapy is the use of interventions to accomplish individual goals within a therapeutic relationship by a professional who has completed an approved music therapy program (American Music Therapy Association, 2013). Music therapy is an allied health profession and one of the expressive therapies, consisting of a process in which a music therapist uses music and all of its facets—physical, emotional, mental, social, aesthetic, and spiritual—to help clients improve their health. Music therapists primarily help clients improve their health in several domains, such as cognitive functioning, motor skills, emotional development, social skills, and quality of life, by using music experiences such as free improvisation, singing, and listening to, discussing, and moving to music to achieve treatment goals.

Due to the paucity of research on music preferences and personality among young adults in the Indian context, the current research has been taken up. In order to extend previous research, the current study aims to examine the association between personality and music preferences. The association between Gender and music preferences will also be studied.

REVIEW OF LITERATURE

Extensive research has been done to study Music Preference and Personality. Various factors like Gender, Peer and socio cultural influence have been studied in association with music Preferences. Research has shown that individuals’ music preferences is a reflection of the unique characteristics of their personalities (Rentfrow and Gosling, 2003; Schwartz and Fouts, 2003). Numerous studies, most having used the Big Five, have been conducted to show that individual personality can have an effect on music preference. These studies are not limited to Western or American culture, as they have been conducted with significant results in countries all over the world, including Japan (Brown, 2012), Germany (Langmeyer, Alexandra, Christian, 2012) and Spain (Chamorro-Premuzic, Tomas, Anna, 2009). Most people hear some form of music every day, and music affects people in many ways from emotion regulation to cognitive development, along with providing a means for self-expression (Rentfrow, Peter 2012). Litle & Zuckerman (1986) were the first to employ a broad range of music genres to assess the personality and music preference relationship, and were the first to examine this relationship using a specific unambiguous personality trait with dimensions of music preferences.

Music preferences have consistently correlated with the Five Factor Model and NEO-PIR traits. For example, Openness was found to correlate with preferences for new age, reggae, and folk-ethnic music, as well as with classical, jazz, and blues. Individuals who score high on Openness take pleasure in cultural and aesthetic experiences and therefore enjoy a wide variety of music styles, especially styles which are less conventional or mainstream (Dollinger, 1993). Like Openness, Extraversion is positively related to a preference for jazz and new age music, but to a lesser degree. Extraversion also negatively correlated with the enjoyment of gospel music. The Excitement Seeking facet of Extraversion strongly correlated with a preference for rock music (Dollinger, 1993). Because Excitement Seeking correlates with Zuckerman’s Sensation Seeking Scale this finding is consistent with Litle and Zuckerman (1986) Sensation Seeking results and supports the theory that Sensation Seekers have a high optimal stimulation level (Aluja, Garcia, & Garcia, 2002). Introversion and Extroversion have also shown different levels of engagement during music listening. For example, intellectual and restrained music, such as music with a formal structure, is attractive to introverts (Keston & Pinto, 1955, Payne, 1980). They prefer to become involved with music and are willing to take time to understand music at a deeper level than extraverts. Contrastingly, extraverts prefer music which is predictable and able to satisfy immediate needs without being too demanding. Extraverts prefer music with human emotional overtones and music which does not require total emotional or cognitive engagement

(Kemp, 1996, p; North & Hargreaves, 1998). Also, Neuroticism positively correlated with a conventional popular music, which may suggest that those scoring high on Neuroticism use such music to abate the negative effects induced by more arousing music (Dollinger, 1993).

Another study conducted by researchers at Heriot-Watt University looked at more than 36,000 participants from all over the world. Participants were asked to rate more than 104 different musical styles in addition to offering information about aspects of their personality. The following are just some of the personality traits linked to certain musical styles. A preference for Pop music is associated with a tendency to be extraverted, honest and conventional. While pop music lovers are hard-working and have high self-esteem, researchers suggest that they tend to be less creative and more uneasy. Fans of Rap Music tend to have high self-esteem and are usually outgoing. Country music fans are typically hardworking, conventional and outgoing. While country songs are often centered on heartbreak, people who gravitate towards this genre tend to be very emotionally stable. Despite the sometimes aggressive image that rock music and heavy metal project, researchers found that fans of this style of music are usually quite gentle. They tend to be creative, but are often introverted and may suffer from low self-esteem. Fans of the indie genre are typically introverted, intellectual and creative. According to researchers, they also tend to be less hard-working and less gentle. Passivity, anxiousness and low self-esteem are other common personality characteristics. People who prefer dance music are usually outgoing and assertive. Classical music lovers are typically more introverted, but are also at ease with themselves and the world around them. They are creative and have a good sense of self-esteem. People who enjoy jazz, blues or soul music were found to be more extraverted with high self-esteem. They also tend to be very creative, intelligent and at ease. (North, 2008)

According to Chamorro-Premuzic, Fagan and Furnham (2010), People rating high in extroversion tend to like social, happy music like pop, hip hop/rap, and electronic music. Extroverts tend to listen to music more and have background music present in their lives more often. Surprisingly, males tended to like sad music and use music for cognitive purposes more than females did.

An interesting research study has looked into the altering effects of classical music on personality: One study had people take a personality test before and after listening to classical music with and without written lyrics in front of them. Both the music with and without lyrics showed some effect at actually changing people's self-rated personality traits, most significantly in terms of openness to experience, which showed some significant increase (Djicic, Maja, 2011). Instead of personality affecting music preference, here classical music altered the assessment of their own personalities and make people assess themselves as more open.

One of the most comprehensive studies to date in this respect is Rentfrow and Gosling's (2003) investigation, in which the authors first determined the major dimensions of music preferences by means of exploratory and confirmatory factor analysis (CFA), and subsequently examined the associations of these dimensions with the well-established Big-Five personality factors. Four music-preference dimensions that were highly consistent across samples and time emerged from their analyses: The Reflective and Complex dimension, which was defined by the genres blues, jazz, classical and folk music; The Intense and Rebellious dimension, which was defined by Rock, alternative and heavy metal music; The Upbeat and Conventional dimension, which was defined by country, sound track, religious and pop music; The Energetic and Rhythmic dimension, which was defined by rap/hip-hop, soul/funk and electronica/dance music.

PROBLEM AND HYPOTHESES

Research Problem: This research seeks to explore Personality characteristics and Music Preferences among Young Adults. Gender Differences in Music Preferences were also explored.

Hypotheses:

There will be no significant difference in the preference for Energetic and Rhythmic music style between individuals characterized as being high on extraversion and low on extraversion

There will be no significant difference in the preference for Reflective and Complex music style between individuals characterized as being high on Neuroticism and low on Neuroticism

There will be no significant difference in the preference for Intense and Rebellious music style between males and females

There will be no significant difference in the preference for Energetic and Rhythmic music style between males and females

METHOD OF INVESTIGATION

Following are the details of the research design and the variables employed in the current study. The sample, its nature and selection, the tools used, the procedure and statistical methods used in the current study are described below

RESEARCH DESIGN

An ex post-facto research design was used for this study.

VARIABLES

Independent variables:

1. **Personality**, as measured by the Big Five Inventory (John & Srivastava, 1999).

2. Gender

Dependent variable:

The Dependent Variable in this study is **Music preference**, as measured by the Short Test of Music Preference (Rentfrow & Gosling, 2003)

SAMPLE: The sample consisted of 160 young adults (19 to 40), with 80 males and 80 females. Snowball sampling method was used to generate the sample. Snowball sampling method uses a small pool of initial informants to nominate, through their social networks, other participants who meet the eligibility criteria and could potentially contribute to a specific study. This statistical method was employed since it was a useful tool to build networks and increase the number of participants who met the eligibility criteria.

Inclusion criteria:

- Individuals are between 21 to 40 years of age.
- Individuals listen predominantly to Western Music.
- Individuals are familiar with the various genres of Western Music.
- Individuals listen to music on a daily basis. (more than 1 hour)

Exclusion criteria

- Individuals diagnosed with any form of mental illness.

TOOLS

The following tools were used in this study:

- The Big Five Inventory (John & Srivastava, 1999)
- The Short Test of Music Preference scale (Rentfrow & Gosling, 2003)

The **Big Five Inventory** is a self-report inventory designed by John & Srivastava (1999) to measure the Big Five personality dimensions. This inventory is mainly used for noncommercial research purposes (Srivastava, 2013). There are 44 items in this inventory. The big five inventory does not use single adjectives as items because such items are answered less consistently than when they are accompanied by definitions or elaborations (Goldberg & Kilkowski, 1985). Instead, the Big Five Inventory uses short phrases based on the trait adjectives known to be prototypical markers of the Big Five (John, 1989, 1990).

The Five Personality dimensions and the number of items that correspond to each are mentioned below:

- 1.Extraversion (9 items)
- 2.Agreeableness (8 items)
- 3.Conscientiousness (9 items)
- 4.Neuroticism (10 items)
- 5.Openness to Experience (8 items)

Scoring: The Big Five Inventory is self-reported and instructions are provided with the inventory. The 44 Big Five Inventory items consist of short and easy-to-understand phrases to assess the prototypical traits defining each of the Big Five dimensions, making it ideal for a large survey where we could expect respondents to devote a limited amount of time. Big Five Inventory items are rated on a 5-point scale ranging from 1 = disagree strongly to 5 = agree strongly (Srivastava, 2003). A total score is obtained for each of the personality dimensions using the following scoring key. Few items are reverse scored.

Big Five Inventory scale scoring ("R" denotes reverse-scored items):

- Extraversion: 1, 6R, 11, 16, 21R, 26, 31R, 36
- Agreeableness: 2R, 7, 12R, 17, 22, 27R, 32, 37R, 42
- Conscientiousness: 3, 8R, 13, 18R, 23R, 28, 33, 38, 43R
- Neuroticism: 4, 9R, 14, 19, 24R, 29, 34R, 39
- Openness: 5, 10, 15, 20, 25, 30, 35R, 40, 41R, 44

The mean is obtained for each of the personality dimensions by dividing the total score by the number of items corresponding to that particular personality dimension.

Reliability and Validity: Although the Big Five Inventory scales include only eight to ten items, they do not sacrifice either content coverage or good psychometric properties (John, Robins, & Pervins, 2008). The Big Five Inventory scales have shown substantial internal consistency, retest reliability, and clear factor structure, as well as considerable convergent and discriminant validity with longer Big Five measures. The scales have also shown substantial agreement between self- and peer-reports (Srivastava, 2003). Mc Crae and Costa (1989) demonstrate that there is a substantial correspondence between the Big Five factors and the four indices of the Myers Briggs Type Indicator.

The **Short Test of Music Preference scale (STOMP)** was devised by Rentfrow and Gosling in 2003. The STOMP was designed to assess music preferences, which are related to personality variables, self-views, and cognitive abilities. The STOMP consists of 14 items that correspond to the following genres of Western music; Classical, Blues, Country,

Dance/Electronica, Folk, Rap/hip-hop, Soul/funk, Religious, Alternative, Jazz, Rock, Pop, Heavy Metal, Soundtracks/theme songs. Each of the 14 items is scored into four music preference dimensions with the highest possible score being a 28 and the lowest possible score on any dimension being a three.

- Reflective and Complex(4 items)
- Intense and Rebellious (3 items)
- Upbeat and Conventional (4 items)
- Energetic and Rhythmic (3 items)

Scoring: The scoring for the STOMP is simple. It is scored on a 7 point rating scale (1= strongly dislike, 7=strongly like). Respondents are asked to indicate the extent of their like or dislike towards a particular genre of music with the following scale:

A total score is obtained for each music preference dimension using the following key: Reflective & Complex: 1, 2, 5, 10

Intense & Rebellious: 9, 11, 13

Upbeat & Conventional: 3, 8, 12, 14

Energetic & Rhythmic: 4, 6, 7

The mean is obtained for each music preference dimension.

Reliability:

Test-retest reliability for the measure ranged from 0.77 - 0.82 (Rentfrow & Gosling, 2003).

PROCEDURE: By means of the Snowball sampling technique, the sample was generated. The questionnaire was handed over only to those who have fulfilled the inclusion criteria. The respondents were given the questionnaire which is inclusive of a Personal Data sheet, The Short Test of Music Preference scale and the Big Five Inventory. The respondents were asked to follow the instructions given on the questionnaire. The respondents were assured that data received by means of this questionnaire would be kept confidential and used only for research purposes. The personal data sheet generated details of the respondent like Age, Gender and duration of time spent per day in listening to music. The data received from the questionnaires was subject to Statistical Analysis.

STATISTICAL ANALYSIS: The t test was the statistical procedure used in the current study. The subjects in the current study were categorized into two, those obtaining high scores and low scores on each of the personality dimensions. The data obtained was assessed using the independent samples t test, to find out if any significant difference existed between the two groups with regard to the preference for the four music styles investigated in the current study.

RESULTS AND DISCUSSION: The results will be presented and discussed in the following sections:

Personality and Music Preferences

Gender and Music Preferences

Table 1: Represents the Mean, Standard deviation, t value and level of significance in in the preference for Energetic and Rhythmic music style between individuals characterized as being high on extraversion and low on extraversion

Extraversion	N	Mean	Std. Deviation	T	Df	Sig. (2-tailed)
Low Extraversion	77	4.30	1.40	-2.49	156	p<0.05*
High Extraversion	83	4.84	1.35			

**Significant at the 0.05 level*

The results of Table 1 indicate that a significant difference exists in the preference for Energetic and Rhythmic music style between individuals characterized as being high on extraversion and low on extraversion. Subjects high on extroversion showed a higher preference for Energetic and Rhythmic music style. Hence the null hypothesis, there will be no significant difference in the preference for Energetic and Rhythmic music style between individuals characterized as being high on extraversion and low on extraversion, is thus rejected.

A Significant difference was found only in the preference for Energetic and Rhythmic music style between individuals characterized as being high on extraversion and low on extraversion. The genres of music that belong to this dimension are Dance/Electronic, Rap/hip-hop and Soul/funk music. This finding has complemented various research studies centred around music preferences an Personality.

Extraversion is another good predictor of music genre preference and music use. People rating high in extraversion tend to like social, happy music like pop, hip hop/rap, and electronic music.

Extraverts tend to seek out songs with heavy bass lines (Rentfrow and Sam Gosling 2003). According to researchers, people who prefer fast pace dance music, (which is a part of the Energetic And Rhythmic music style) tend to be assertive and usually outgoing.

Table 2: Represents the Mean, Standard deviation, t value and level of significance in the preference for Reflective and Complex music style between individuals characterized as being high on Neuroticism and low on Neuroticism

Neuroticism	N	Mean	Std. Deviation	T	Df	Sig. (2-tailed)
Low Neuroticism	116	4.91	1.10	2.77	82	p<0.05
High Neuroticism	44	4.40	1.02			

**Significant at the 0.05 level*

The results of Table 2 indicate that there is a significant difference in the preference for Reflective and Complex Music style between individuals characterized as being high on Neuroticism and low on Neuroticism. Individuals characterized as being high on Neuroticism have shown a higher preference for the Reflective and Complex Music style. Hence, the null hypothesis, there will be no significant difference in the preference for between individuals characterized as being high on Neuroticism and low on Neuroticism, is rejected.

Table 3: Represents the Mean, Standard deviation, t value and level of significance in the preference for Intense and Rebellious music style between males and females.

GENDER	N	Mean	Std. Deviation	T	Df	Sig. (2-tailed)
Males	80	4.98	1.30	2.40	158	p<0.05*
Females	80	4.48	1.30			

**Significant at the 0.05 level*

The results of Table 3 indicate that there is a significant difference in the preference for Intense and Rebellious music style between males and females. Males have shown a higher preference for the Intense and Rebellious music style when compared to females. Hence, the null hypothesis, there will be no significant difference in the preference for Intense and Rebellious music style between males and females, is rejected. Findings from the current study correspond to previous research studies. According to statistical averages, males prefer hard and tough music, while females are partial to softer and more romantic music. Looking across genres, males prefer hard rock, progressive rock, heavy rock, rock n roll, and heavy metal (Zillman and Gan 1997). George and colleagues (2007) conducted a study to understand the gender differences with respect to preferences of music. The study found that males tended to prefer rebellious music (like heavy metal or punk music)

Table 4: Represents the Mean, Standard deviation, t value and level of significance in the preference for Energetic and Rhythmic music style between males and females.

GENDER	N	Mean	Std. Deviation	T	Df	Sig. (2-tailed)
Males	80	4.2375	1.37497	-3.60	156	p<0.05*
Females	80	4.9792	1.22821			

**Significant at the 0.01 level*

The results of Table 4 indicate that there is a significant difference in the preference for Energetic and Rhythmic music style between males and females. Females have shown a higher preference for the Energetic and Rhythmic music style when compared to males. Hence, the null hypothesis, there will be no significant difference in the preference for Energetic and Rhythmic music style between males and females, is therefore rejected. Findings from this study have complemented the previous lines of research studying the relationship between gender and music preferences

Females prefer mainstream pop, folk, classical and dance-oriented music Results from this study complement the above finding (Zillman and Gan 1997) Research studies have come up with interesting findings studying gender and listening to music. Men tend to use music for more cognitive reasons, while women tend to use music for more emotional reasons

(Chamorro-Premuzic, Tomas; Fagan, Patrick & Furnham, Adrian, 2010). Also, men tend to exclude musical genres from one another more than women do (Langmeyer, Alexandra; Guglhör-Rudan, Angelika & Tarnai, Christian, 2012).

CONCLUSIONS

There is a significant difference in the preference for Energetic and Rhythmic music style between individuals characterized as being high on extraversion and low on extraversion

There is a significant difference in the preference for Reflective and Complex music style between individuals characterized as being high on Neuroticism and low on Neuroticism

There is a significant difference in the preference for Intense and Rebellious music style between individuals characterized as being high on Openness to Experience and low on Openness to Experience

There is a significant difference in the preference for Intense and Rebellious music style between males and females.

There is a significant difference in the preference for Energetic and Rhythmic music style between males and females.

LIMITATIONS: The study is limited to the urban population in the cities of Hyderabad and Chennai only and hence is representative of only two cities. Thus, the results cannot be generalized to rural populations and other urban cities.

Difference in lifestyle and upbringing may have influenced respondents' musical preferences.

It is possible that respondents may have indicated preferences without having a very clear understanding of the musical styles.

IMPLICATIONS: Identifying an individual's preferences can help Counselors and Psychologists gain a greater level of insight into an individual's personality given the fact that music preferences has been found to predict personality characteristics. Music is seen to be a vital aspect in regulation of emotions, evoking memories, helping in communication and enhancing mood (Barret et al, 2010; Hunter et al, 2011; Zenter et al, 2008). Knowledge of an individual's music preference can help in the development of a treatment plan in music therapy.

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GROWING ROLE OF STARTUPS IN HYDERABAD

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Abstract: Entrepreneurship is a tough game, which is certainly not for those people who cannot face problems and with stand difficulties. Entrepreneurship is not only about making money, but also to have the courage to face all the difficult problems. This study is focusing mainly to study the nature and different types of upcoming startups and to study the motivational factor of an individual startup and also regarding government subsidies. Finally, there are different types of startups like boutique, food, fashion designing etc. Most of the people are not satisfied with the subsidies provided by the government and should give more subsidies and they have to concentrate on this factor.

Introduction: Entrepreneurial startups is the designing, launching and gaining importance in India and the role of economic liberalisation and globalisation. The hidden entrepreneurial potentials of startup have gradually been changing with the growing sensitivity to the role and economic status in the society. This has led to the growing interest of researchers in the areas of startup. According to Encyclopedia Britannica, "an individual who bears the risk of operating a business in the face of uncertainty about the future conditions is considered as entrepreneur".

The life cycle of startup: In the coming generation, where every business starts with innovative ideas, the startups can range the band of colors. There are the following stages which is reviewed to succeed to a Startup. Foundation startup: Every businesses lifecycle, the foundation should be storage by the route through there new ideas. For that the business needs to face challenge and have focus and be able to create Money sources. Customers stage: Where, business is now standard and legal you can have your first customers, in that you have to attract the customers through service. Competition stage: Where you create the revenues and customers for in creating the upcoming opportunities and facing new challenge issues to obtain the aim of prophets. Expansion stage: Whether business will enter into a new period of growth into market for increasing the distribution channels.

Ending stage: This is the stage where the business needs to shut down the business due to loss occurred in the market.

Background of graduate startup in India: In this, graduation in India have large population and unrecognized potential and also have heavy unemployment in the society. According to statistics, 600 Universities and more than 40000 colleges are having more than 30 million students and are under the education system and more than 80% of students are doing their Bachelors Degree for 3 years in the following streams BA BCom BSc degrees and one sixth students population are doing engineering technology.

According to the data from the Kauffman Foundation 2015, it has marked the startup activity at a great height after the great recession took place.

Types of Startup's

- Manufacturing
- Restraunt, Café & Bakery
- Non-profit
- Farm & Food Production
- Construction & Engineering
- Boutique
- Retail & Online Stores
- Bar & Night Clubs
- Wholesale & Distributor
- Medical & Healthcare

Motivational factors for startup to grow: Every startup has it's own kind of journey and motivational factors and stories which help them to grow in their work. And of course there are many factors that hold significant importance to make a Startup insanely crazy for being a boom in the market. Being passionate about the work: Startup cannot be a lifeless soul who doesn't wants or wishes to believe in anything. Startups needs to know how to take calculated risk and involves a many more things at the stake. Courage of taking various risk only come when you are passionate about something and have faith within it.

Self Reliance: Having Self-confidence and being self reliant is the another motivational factor which encourages the world's population towards starting showing a Startup. What are the problems that people do not want to work under companies is that, you are not given the freedom to solve a problem on your own but with our own startup you are the boss and you can done work things by your own way. Positive feeling of the accomplishment: Making a difference in the society makes us feel proud and that is also what plays a crucial role in establishing a business or a venture.

More and more of personal growth: When you start working for yourself you have nobody to fall back on you get most of the time for yourself and think about yourself.

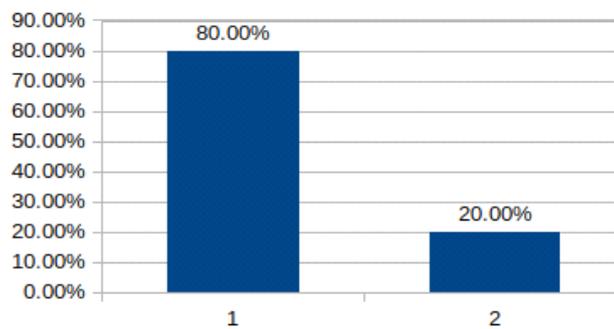
Objectives:

- To study the nature and different types of upcoming startups.
- To study the motivational factor of an individual startup.
- To know whether the startup owners are satisfied with government intermediaries and subsidies.

Need of the Study: The need of this study is, to study the nature & different types of upcoming startup's and also to study the motivational factor of an Individual startup to start their business and finally to know whether the startup owners are satisfied with the subsidies providing by the government.

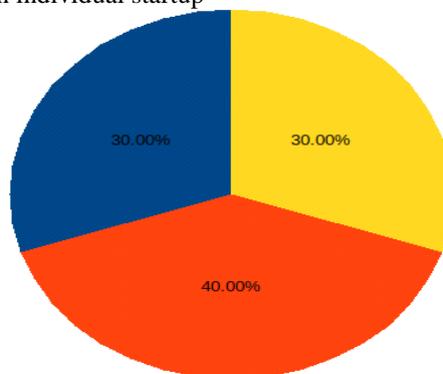
Scope of the Study: The scope of the study is limited to 10 startup's only in the city of Hyderabad.

Data Analysis & Findings: Chart relating to different types of Startup's

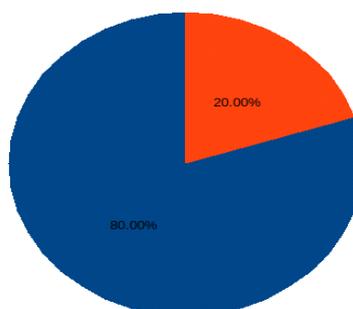


Interpretation: From this above chart it is found that,80% of the respondents are coming up with different startups like boutique, relating to food and fashion designing. 20% of respondents are coming with small businesses like local talents.

Chart relating to Motivational factor of an individual startup



Interpretation: It is found that, 30% of the respondents are starting their startups because they inspired by successful people.



40% of the respondents responded that out of passion they are starting.

30% of the respondents responded that just because their parents are into business they are continuing the same. Chart relating to Government Subsidies:

Interpretation: it is found that 80% of the respondents were not getting proper subsidies and satisfaction from the government and 20% of the respondents satisfied and getting subsidies.

Suggestions: It is suggested by the respondents that if they are giving more subsidies for people they can grow in the particular field and they should encourage the people who is having interest regarding that particular startup.

Conclusion: Startups take time, effort & energy. Many business starts with a dream, but it takes more than just a dream for them to grow into a successful businesses finally, I want to conclude that now-a-days the young generation (18-25 age) are showing interest in the startup business with different types like Boutique, Food & fashion Designing Etc. They are starting the startups by inspiring from other people and out of passion they are coming out. Finally, they are not getting proper subsidy for their growth in the business world. According to our research concentrating on whether they are getting subsidies from the government, this study can be extended up to what extend the government can help the entrepreneur and as this trend creating topic which can be directed for the future research.

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CRAFTING AN INDUSTRY READY ENTREPRENEUR: THE NEED OF THE HOUR

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Abstract: In the present era, entrepreneurship is an engine which facilitates the growth of an economy. Entrepreneurship is a process of initiating a business; often a small business can thrive in the market and earn profits. Entrepreneurs are the people who generate such businesses by taking risks in the hope of earning profits through the business. On the other hand employment is a fixed paid job where the employee does not risk but earns a periodic payment called salary. India is a labour-intensive economy and there is a dire need for more employment opportunities as more students get educated and are on the lookout for jobs. Therefore, there is a greater demand for more start-ups to generate employment to sustain the booming population. The present study seeks to encourage more and more youth of today to become entrepreneurs and there is also a clarion call for a change in the mindset of the present generation to shift focus from being an employee to an entrepreneur. A primary data was conducted to elicit the views of the present generation on the need for more entrepreneurs. Relevant secondary data has been incorporated to add value to the topic and make the study rich. There needs to be a clear shift in perspectives and opportunities available to the youth today to opt for entrepreneurship can increase employment as compared to employment seekers who need jobs. Entrepreneurship is the roadmap for providing employment that could sustain the future generations, facilitate the Gross National Income of India and help in nation building.

Key Words: Entrepreneurship, labour intensive, sustainability, employment-generation.

Introduction

The impact of globalisation and industrialisation has transformed the Indian ethos of business today. A number of positive factors such as education, increased level of income and better standard of living of people, improved technology have contributed to the change in the outlook of the urban population. India being a labour-intensive economy has a flip side too. The government and private organisations have not been able to grapple with and sustain employment and this is a serious malaise affecting the economy. The present article would seek to provide a workable solution to the ever-increasing problem of unemployment plaguing the nation.

Objectives of the study:

The objectives of the study are to:

Analyze the reasons for change in the mindset of people from secured employment to becoming an entrepreneur.

Study the various initiatives provided by the government to the budding entrepreneurs.

Suggest ways to convince the youth of today to think of entrepreneurship as a viable step to provide employment opportunities.

Understanding the Concept of Employee Vs Entrepreneur: An employee is a person who works for a salary under an employer, bears no risks but earns a periodic sum of money called salary. On the other hand, an entrepreneur is a person who initiates a business, undertakes risks and triggers the thought process converting it into action and for shouldering risks to earn profits. In the words of Schumpeter "an entrepreneur is an innovator who carries out new combinations to initiate the process of economic development, gets together the products, process, technology, markets, establishes a new organisation called enterprise and the individual is called an entrepreneur.

The Emerging Need for Entrepreneurship: In a democratic country like India where population is ever on the rise there will always be an employment gap. If statistics has to be believed, the unemployment rate is around 4%. Moreover, 40 % of the population constitutes the young adults and their unemployment rate is around 18% and this is a high ratio. There is a clarion call for more people today to shift their focus on being an entrepreneur rather than seek employment so that there would be a balance between employment and entrepreneurs. This uncertainty in employment rate can be decreased if more and more educated people take the initiative to kick-start an organisation to be employment-generators. The government can encourage, facilitate and assist such entrepreneurs who seek to start their own ventures. Their efforts can also be lauded and awards can be initiated to encourage more people to generate employment opportunities. Nurturing entrepreneurship can have a rippling effect on the economy, add to the Gross National Income, innovate new products and materials and help in nation building. The innovative entrepreneurs through their positive thinking and unique inventions can impact the society and this can lead to a spiral effect of change through which the traditional modes of employment and latest innovative techniques like smart phones, online apps can be utilised to increase in creating more job opportunities. Thus, fostering entrepreneurs can bring about a phenomenal change, increase economic growth but all these efforts need to be channelized properly by governmental intervention so that entrepreneurs stay morally fit and do not create another phase of post-independence crisis, where concentration of economic power was in a few hands-which led to inequalities in income and created a big gap between haves and have nots.

Requirements for Successful Entrepreneurs: Liberalisation and privatisation has ushered in global changes in the pattern of thinking among the educated people in India. A successful entrepreneur needs to develop, think and re-think out of the box. The following core competencies are needed by an entrepreneur:

Innovation and expertise: International business has made it feasible to own business today. The concept of wealth and family business is outdated. Creativity and innovation are the factor needed by a successful entrepreneur. It needs brain and brawn to become an entrepreneur.

Honing skills and being a problem solver: A successful person needs the vision drive and hone his business skills to start a company. These entrepreneurial skills and abilities will help him. An entrepreneur is should be ready to take risks, be a problem-solver and work with his hands. The philosophy of “When the going gets tough, it is the tough that get going”, will enthuse him to reach great heights.

Equipping oneself with the latest knowledge: An entrepreneur should always acquaint himself with the latest technology , recent updates and be vigilant in order to incorporate them.

Be a change agent: “Change is the only constant”. An entrepreneur has to be the one to be a game changer and take risks. He has to keep himself involved in the work and not just be a leader but also a part of the team to enable the organisation to achieve the goals of the organisation.

Ability to Manage Finance: ‘Finance is the lifeblood of every business’. Successful businesses can be started with ongoing funding to aspiring entrepreneurs. An entrepreneur should be able to obtain finance from sources like venture capitalists, investors, bank loans, crowd funding.

Thus the mantra of success for an entrepreneur is a combination of all the above mentioned qualities.

The Growing Preference for Entrepreneurship: In the recent scenario there has been a lot of talk on entrepreneurship as the next generation imperative. Entrepreneurs with a will to achieve are in demand. It isn't easy for a person to think and be an entrepreneur, but according to the statistics we notice that the rate of people opting to become entrepreneurs have been increasing rapidly. A changing mindset is fostering a clear vision that could motivate and inspire people to achieve their goals and aspirations. An entrepreneur with a strong vision creates miracles from ideas and technology.

Secondly, Today's youth, know what they want, and this spirit urges them to find freedom in whatever plans they undertake. The budding entrepreneurs are the ones who feel a need for freedom of thought, expression. They want to be their own bosses rather than being under someone. This changing mindset is one of the reasons for people opting to be an entrepreneur. Youth of today believe in taking up challenges and creating opportunities rather than being a part of one that is created by others. Thus, entrepreneurship is built on the strong foundation of dreams, mission, vision and an action plan.

Government's Role in Developing Entrepreneurship: In the recent years, a wide spectrum of new programmes and opportunities to nurture innovation has been extended by the Government of India across a number of sectors. It has noticed the paradigm shift of people's mindset from being an employee to an entrepreneur and felt the need to encourage the growing talent.

In a developing economy like India, the government alone cannot fulfil the need for employment. Individuals also need to come forward to help themselves given the viable business opportunities and atmosphere by the government.

On 28th of February in the year 2015, the current finance minister Arun Jaitley said that “if we really want to create jobs, we have to make India an investment destination, which permits that start of a business in accordance with publicly stated guidelines and criteria.

Some of the initiatives taken by government to encourage budding entrepreneurs include:

Ministry of Skill Development and Entrepreneurship: Prior to the establishment of this Ministry, various Departments of the Government have worked in collaboration with people, but the current Government has established this Department to foster entrepreneurship. By 2022, India has a target to obtain skill development for about 500 million people, primarily through encouraging private players to provide viability gap funding and skill development programme initiatives. The government on its part is encouraging individuals interested in being entrepreneur by providing free training programmes and creating arenas to become entrepreneurs.

District Level Incubation and Accelerator Programme: This is a programme which was initiated at the district level in order to encourage ideas for start-ups. Though there has been hurdles in its proper functioning a few changes are likely to be taken to keep the initiative going.

Make in India: Designed to transform India into a global design and manufacturing hub, the Make in India initiative was launched in September 2014. It is a programme designed to encourage talent in the manufacturing sector inviting young talent, businessmen and investors from around the world to overhaul outdated processes, policies and to centralise information about the opportunities available in this sector.

Stand up India: This initiative was launched in 2015 to extend credit to the underprivileged of the society to enable them to stand up on their will and try to achieve something. The Stand-Up India portal also acts as a digital platform for small entrepreneurs and provides information on financing and credit guarantee.

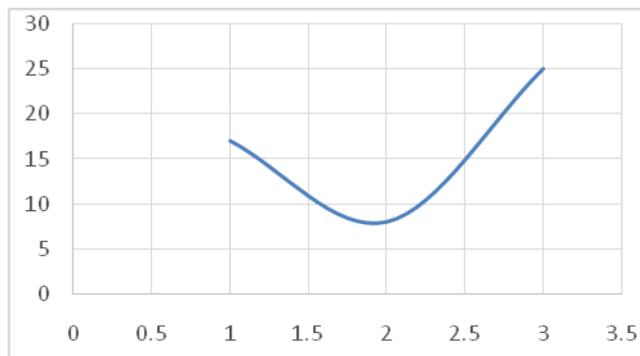
Initiatives from the side of the government have never seen an end as there is no end for talent and creativity. To encourage such talents our government has, is and will be starting up programs. All these initiatives on the part of the government will create a new breed of budding entrepreneurs who will work positively.

Analysis and Interpretation: Entrepreneurship is not an easy task as most of us think it to be. It takes an idea to do something new, to innovate, to help and to satisfy oneself with what one desires to be. In order to analyse the changing preferences of the youth of today, we have conducted a survey consisting of 25 educated respondents around the age group 18-30 in which an analysis was undertaken in a number of areas such as their interests, reasons for their interests, factors driving them to be entrepreneurs and their opinions regarding their views on being entrepreneurs. The findings make a comparative study between the employees, entrepreneurs and students who are willing to be entrepreneurs. There is a dire need in today’s Indian environment to encourage entrepreneurs as the rate of unemployment has been on a constant increase creating a worry for the younger generation. The data thus collected are tabulated, analysed and the results have been depicted as below. An entrepreneur is a person who has the freedom to put his ideas into the business, works at his convenience, thinks independently and sets his norms of functioning. Table 1 reveals the 10 of respondents believe this fact.

TABLE 1: Entrepreneur Vs Employee



TABLE 2: Entrepreneur vs. Employee: Interests



The youth of today are the deciders of tomorrow. It is heartening to note that 50% of the respondents (Table 2) are interested to become entrepreneurs; this indicates that change has already begun. 21 respondents opined that as an entrepreneur they could think out of the box, hated monotony and wanted to make a difference as entrepreneurs (Table 3)

TABLE 3: Reasons to be an entrepreneur

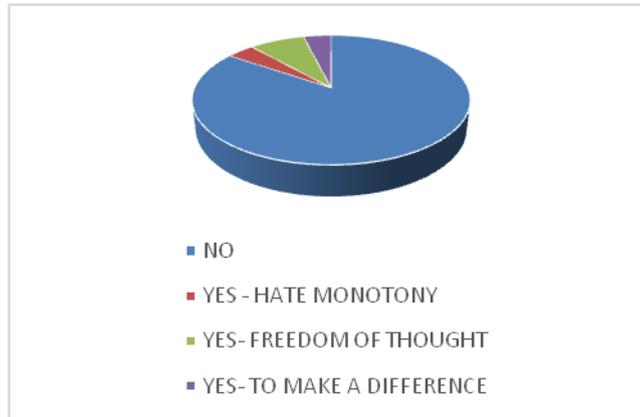
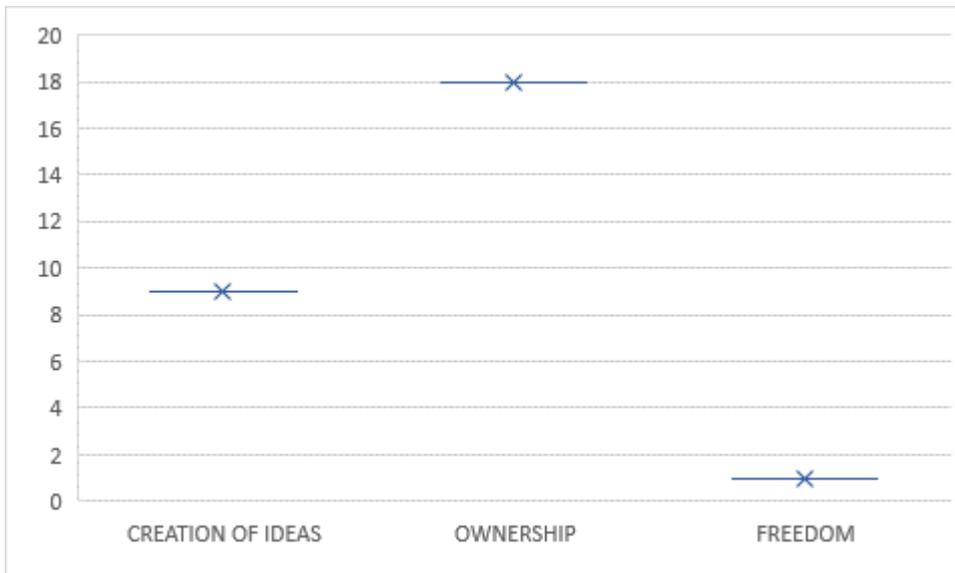


Table 3 recorded the respondents' version of the term entrepreneur. An entrepreneur according to them is a person with creativity and initiative (9), ownership (18) and a person with freedom to carry out his ideas.

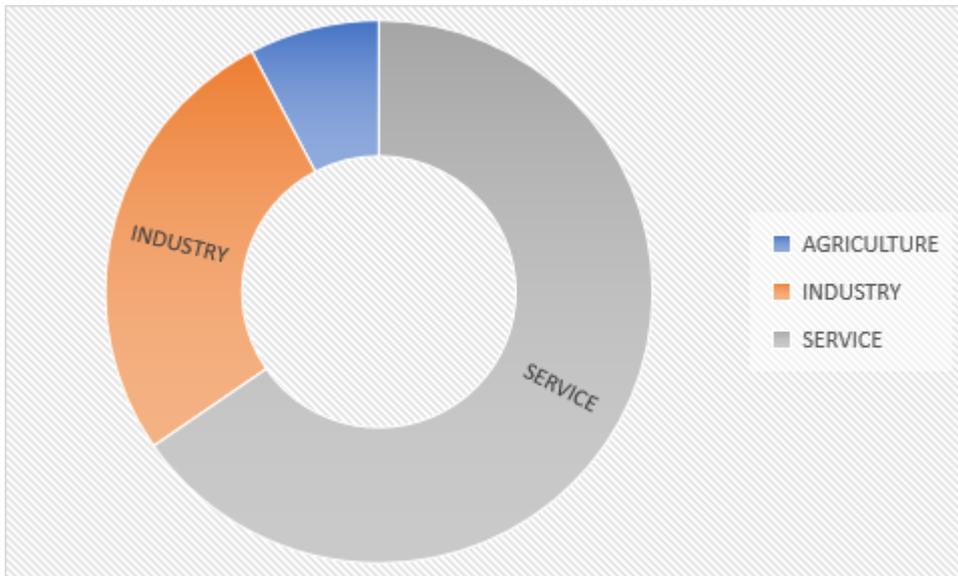
TABLE 4: Understanding of the term 'entrepreneur'



The popular sectors for entrepreneurs to select have been studied in the survey. The most highly preferred sector is that of services, followed by industry and agriculture as indicated in

Table 5

TABLE5: Options of sectoral venturing



The most influential factor to have a start-up is emergence of ideas, as this is what most of the respondents believe in. The next factor is money, as ideas need financial support, followed by time and support as revealed in Table 6.

TABLE 6: Factors influencing start-ups

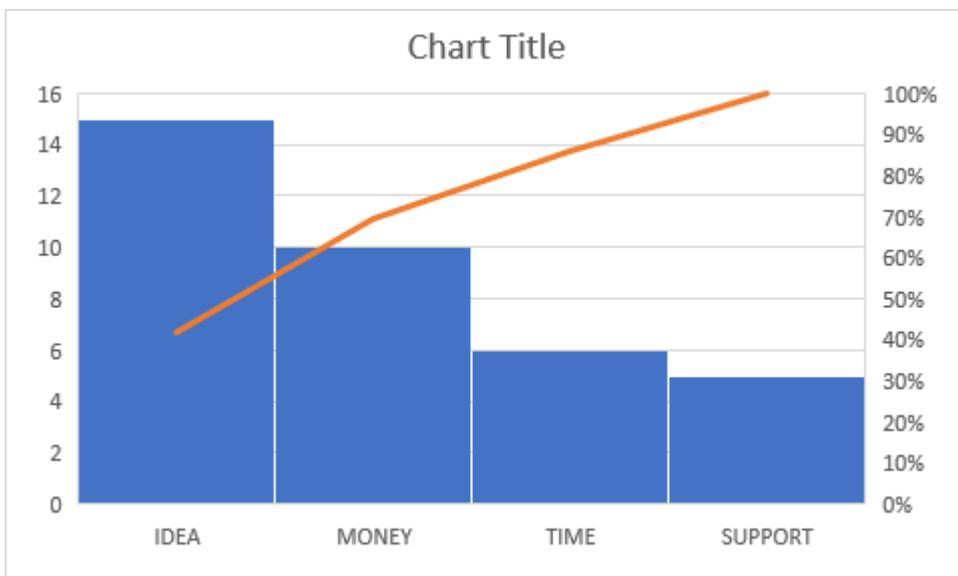
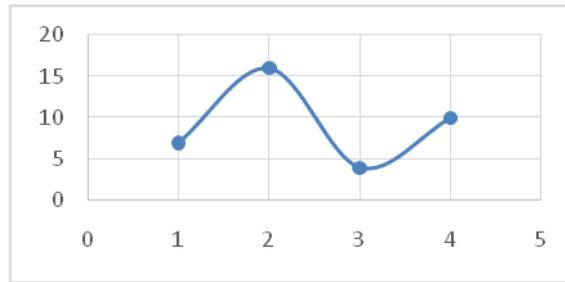


TABLE 7: Sources of finance



Sources of finance are a very crucial element for entrepreneurs. It is said that “money makes a mare go”. Most of the respondents in the survey felt that banks and financial institutions would form a credible source of finance. (Table 7). Only a few felt that they could depend on family and friends to support them in their venture.

TABLE 8: Government assistance for budding entrepreneurs?



The Government is making a number of efforts to encourage and foster genuine entrepreneurship, but many of the respondents were ignorant of this fact. (Table 8). Therefore, the Government should leave no stone unturned to advertise its initiatives in various promotional channels.

TABLE 9: Opportunities Provided for Entrepreneurs?

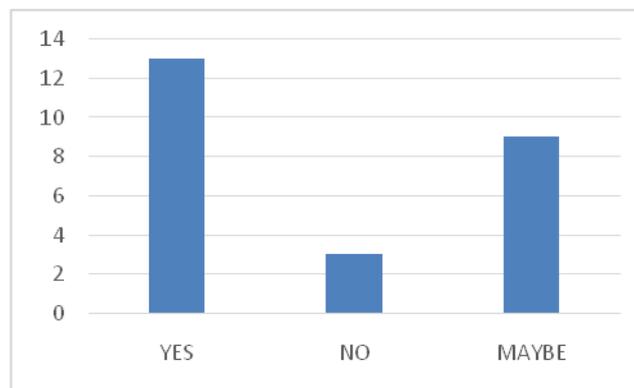
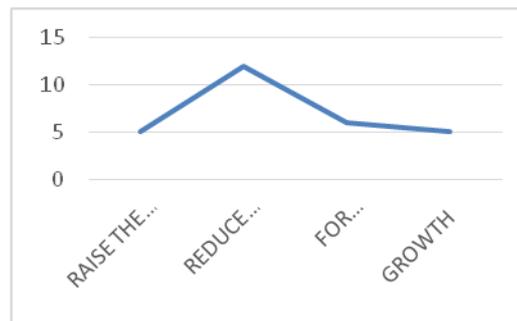


Table 9 shows that, most of the youth today feel that the market is ripe for entrepreneurship as there are many opportunities and competition is galore for people to start small.

TABLE 10: Need for entrepreneurs



The study shows (Table 10) that India needs entrepreneurs, for a number of reasons, such as to reduce the unemployment rate, raise the standard of living, for innovation and also for accelerating the pace of growth.

Findings :

60% of the youth want to be entrepreneurs irrespective of their present work qualification.

Most of the youth of today feel that freedom of expression and thought is one of the main reasons for the choice as an entrepreneur.

It has been noticed that more than half of the younger generation are interested in becoming entrepreneurs rather than being someone's labourer.

Only 20% of the people wanting to be entrepreneurs have grown up in a business family.

Around 48 % have considered venturing out into their own business.

Only a few have actually worked and experienced the feel of being their own boss.

In today's changing scenario it is most likely to venture into the Service sector as it is trendy, provides lots of opportunities and is very much helpful to reduce the rate of unemployment.

Suggestions and Conclusions: The country is in need of young talented entrepreneurs to reduce the ever-increasing rate of unemployment. A number of reasons are driving today's youth to start up their own businesses which are helping the economy succeed in reducing its issue of unemployment. The enterprising entrepreneurs are many but those who have actually ventured into their idea of interest are countable. As actions speak louder than words, it is suggested that the ones who are in the thought of changing the mindset of others and willing to understand the risks have to first go through the risks themselves to have a clarity on how to solve risk by themselves in order to become successful in their goals. The government of late has been providing the budding entrepreneurs with a lot of new initiatives for their upliftment and encouragement, but it is disheartening to find out that not all are aware of these initiatives. It could be suggested that the government and the knowledgeable youth spread wide awareness to encourage more entrepreneurs. Another hurdle that can drive people away, from trying their hands at entrepreneurship is the risk of finance. This means there should be specific financial institutes to aid a budding entrepreneur, look at his initiatives, payback ability and sanction loans to help him start his business. A tax-free possibility for a period of 5 years can be given to these budding entrepreneurs (by the Government) till their business kick-start and it starts earning profits. This will go a long way in encouraging people to initiate businesses.

We have analysed the increasing need for the paradigm shift among the youth of today to become an entrepreneur, rather than take up employment and found out that is easier said than done. It is not an easy task to leave what you are today and be what you want to be. Entrepreneurship is a risky affair but the fruit of the rewards can be sweet. Being your own master is better than being someone else's servant. Therefore to become an entrepreneur, seems like an uphill task involving a set of complexities, but the future of India lies in grooming more entrepreneurs as this is the panacea for all the rising unemployment problems.

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INNOVATION IN ENTREPRENEURSHIP

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Abstract: The current global economic financial crunch is making the government pay emphasis on innovative entrepreneurship. This step can help in promoting economic growth overcome the global crisis. Augur competition creates employment and helps alleviate poverty which boosts the effect and address key social challenges. Innovation is that magic wand for entrepreneurs, by which they affect change as an opportunity for different business initiatives. Entrepreneurs are the employment creators who utilize innovation to affect change positively and generate opportunities for successful innovation. There is a dire need for the application of knowledge and principles of successful innovations in an enterprise. So innovation being an important component in the development of successful entrepreneurship, our research paper aims to study the importance of innovation in the key growing areas of entrepreneurship.

Key Words: Entrepreneurship, Innovation, Social Challenges and Opportunities.

Introduction: Entrepreneurship is the process of creating something new in association with that which has value by dedicating the necessary time and the required effort for creativity, assuming the financial, psychic, social risk and receiving the rewards associated with monetary and personal satisfaction i.e. name and fame that accompanies it.

The production in terms of innovation needs to have value i.e. value in exchange for the entrepreneur and value in use to the customers for which it has been developed. These customers can be (1) the market of organizational buyers for business innovation, (2) the hospital's administration for a new admitting procedure and software, (3) the engineers in seek of a new test.

Objectives of the study

The objectives of the study are:

1. To understand the vital role innovation plays in the entrepreneurship development.
2. To study how innovation helps in facing social challenges.
3. To know the importance of innovation in the growth of entrepreneurship and its impact on economic development.

Impact of innovation on growing entrepreneurship: Innovation is the key to success in entrepreneurship. As individuals, we are innovators as we are adapting well to our needs and creating our own solutions and same is the case with the entrepreneur too. The innovation in entrepreneurship helps the country by changing the trend and providing new and innovative products and services by improvising the one that already exists. Thus, being innovative helps us to become successful in all the spheres. The economy is composed of enterprises, ventures, and businesses. Our economy has sustained only due to industry leaders who have been able to adapt to the changing times and satisfied mostly the consumer's needs. Small businesses are an important part of the economy. Without it, our economy would not sustain itself. Sustainability should be perceived as it is an ongoing process itself and constantly be able to organize and fulfill the demands of the people in a community. In every business, it is imperative to be industrious, innovative and resourceful. Companies and enterprises keep innovation as a component of their organization. An innovation paves importance to the success of the company. Entrepreneur, as innovators, see not just a single solution to a need. They come up with ideas until and unless the idea has an association with multiple solutions. Even companies too, often see the problem-solving capability as an innovative factor in employees. They come up with seminars and pieces of training to keep their employees potential enough to create something worthy of others and in turn, increase the profit of the company.

Innovation as an important tool to minimize social challenges: Entrepreneurship comes with a lot of challenges. Rewarding challenges, but jarring challenges nonetheless. Experienced entrepreneurs have to handle with this no matter how much ever they are experienced- trying to introduce a brand, adjust to match or increase the competition and keep the business profitable is a challenge. For new and young entrepreneurs, there are unique challenges and - one among them is innovation. If you're just getting into the sphere, or your aim is to become an entrepreneur, then you should be courageous enough to overcome the challenges. Through the distinctive contribution of innovative goods and services to the community, entrepreneurs segregate from heritage and indirectly support freedom by decreasing dependence on outdated technologies. This results in improving living standards, higher morale, and economic freedom. The most important factor in creation and scattering disposal of technology is innovation. Different kinds of innovation play a role in various phases. Opportunities for successful innovation experiments and a likely different framework for development are emerging. Remarkably, these opportunities result from the rise of information and communication technologies, the development of value chains globally, the increased importance of some emerging countries in the global innovation system, the growth of economic services and an open invite to trade and foreign direct investment. Today a key challenge for innovation policy in loom countries is to initiate inclusive growth and support research addressing major social challenges. Innovation has long driving advancements in productivity and economic growth, while it is estimated that the contributions of innovation are not only economic but innovations in industry have liberalized employees from tough and risky tasks through automation – it is also estimated that much of the thrust and focus of efforts to adopt innovation have paved importance on economic objectives. However, this is changing as entrepreneurs, firms and policymakers estimated that modern economic growth

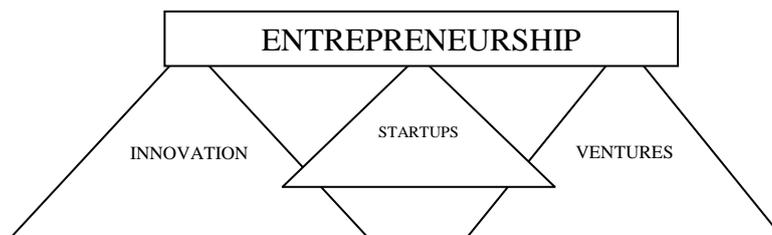
must go hand in hand with the progress of society. Today's global problems ranging from climate change to unemployment and poverty both economic and social. Mobilization of innovation along with science and technology is the best combination to respond to social challenges.

Innovation - growing trends in entrepreneurship: Our personal philosophy towards entrepreneurship has always been to focus on the triple P's i.e. People, planet, and profit and it's time to think- 2018 will be the year for which the rest of the world participates. Seeing cities like London put out a call for green entrepreneurs is inspiring, and I hope more cities, countries, and companies understand the need for keeping our planet top of mind. Entrepreneurship is that field which is growing by leaps and bounds as a transformational megatrend of the 21st century. It provides the capacity to remake economies throughout the world. As essential inputs of economic growth, entrepreneurs are the lifeblood of an expanding economy, creating employment, introducing new products and services and promoting higher upstream and downstream activities of value.

In recent years, the global entrepreneurial landscape has experienced a paradigm shift in terms of trends, with small and medium-sized entrepreneur's (SMEs) playing a major role in the social and economic advancement and transformation. According to the Organization for Economic Cooperation and Development, small and medium-sized entrepreneur's (SMEs) on an average provide around 50% or more to the GDP; provide employment to an estimated 60% of the local workforce; sum up to 70% of new employment opportunities; and account for about 30% of exports. As per, a report published by the Department of Statistics (DoS) in 2012 stated that there are more than 100,000 SMEs in the Kingdom, depicting some 97% of all companies, thus making them even more essential to economic wellbeing when compared to other countries worldwide. Moreover, women across the globe are introducing and operating new enterprises at a tremendous pace than ever, positioning enterprises spearheaded by females as an increasingly essential source for new jobs. Today, nearly 126 million women are establishing or heading brand new businesses in 67 economies around the globe, and at least 48 million female entrepreneurs and 64 million female entrepreneurs presently employ one or more people, ever since, it is imperative that government, policymakers, and business leaders come together to support and strengthen entrepreneurship, which has proven to be essential to socioeconomic development throughout the world, especially in a country such as Jordan that has massive entrepreneurial potential and depends almost totally on SMEs to grow its national economy.

Role of entrepreneurship in economic development: Entrepreneurship and economic development are some way or the other related to each other. Schumpeter opines that entrepreneurial process is an important factor in economic development and the entrepreneur is the key to economic growth. Whatever be the presence of economic and political set-up of the country, entrepreneurship is crucial for the development of an economy. Entrepreneurship is an approach to management that can be adapted to start-up situations as well as within existing businesses. The emerging interest, in the area of entrepreneurship, has paved alongside interest in the changing trends of small businesses. Small entrepreneurship has a phenomenal potential in a developing country like India. So, statistically the data and few of its analysis of several countries show that the small industries have grown faster than the large industries over the last few decades. Large industries first departed jobs while small industries created new workplaces.

Entrepreneurs are generally treated as an asset to the nation, so it's essential to inculcate, motivate and remunerate to the greatest possible extent. Entrepreneurs can transform the way we live and work. If successful, their innovations may upgrade our standard of living. They also provide employment opportunities by creating wealth in their entrepreneurial venture which helps in a productive society. Example, Smartphone's and apps are taking revolutionary change throughout the globe. Smartphones are not new to wealthy countries. The growth of China's market for smartphones shows that the technological entrepreneurship will have intense and lasting impacts on the entire human race. Added on, with the impact of globalization of technology entrepreneurs in less developed countries can have access to the similar types of equipment as their competitors in developed countries. They also have the benefit of a lower cost of living; a young entrepreneur from an underdeveloped country can match the competence of an existing product of a multi-million-dollar from a developed country.



Conclusion: To conclude, the study of entrepreneurship has great applicability today. Though it helps entrepreneurs to fulfill their personal needs it also contributes a lot to the economic contribution of the new business. Entrepreneurship acts as a positive force in an economic growth. As when a new job is created the national income is increased. This helps to bridge the gap between innovation and the marketplace. Lastly, innovation is that tool that can change the whole scenario of the business or an enterprise.

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‘START-UPS’ – A GATEWAY IN A CONDUCTIVE INCUBATION MECHANISM**Pranavi Manyam**

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Abstract: Entrepreneurship is an emerging factor in the market economy, which drives economic growth and Innovation through delivering new creative opportunities. Start-ups since emerged have taken an entirely new strategic domain to explore the start-up ecosystem through Business Incubation mechanism. Business Incubators are designed as launching pads for business start-ups. The cycle of any new start-up business needs a number of support services at its different phases to cope up with dynamic environmental and operational challenges. It aims in creating a portfolio aligned with phases of start-up is a vital domain to explore and intend to this conceptual study. The article attempts to portray the evolution of business incubation mechanism along with the presence of business incubation facility in modern entrepreneurship development tools employed for supporting start-ups. Assessing an incubation mechanism is a complex task. This study contributes to the body of knowledge, which can serve researchers and practitioners in the planning, and execution of Conducive incubation mechanism as a novel approach for growth opportunities to strengthen start-up ecosystem. In addition, to foresee an insight of Indian incubator model which has significantly improved to seek new ideas for aspiring business entrepreneurs in the world economy to enhance entrepreneurial climate in a conducive incubation mechanism.

Key Words: Entrepreneurship, Incubation, mechanism, start-up ecosystem...

Introduction: A Start-up is an entrepreneurial venture in a conducive business incubation mechanism, which is typically a newly emerged, fast-growing business that aims to meet a marketplace need by developing a viable business model around an innovative product, service, process or a platform. A start-up is a venture designed to develop and effectively validate in a business incubation model. Business incubation mechanism enriches growth and development of the entrepreneurial companies during their start-up period and helping to survive in dynamic environment during their most vulnerable stages. They provide their client companies with various business support services and resources, which are intended for the young firms to navigate the competitive external situations and dynamic environment. Business incubation is an organized venture creation process, which provides a well-composed portfolio of early stage of development. Incubation mechanism facilitate startups for providing some of the most important goals in the society namely creating jobs, enhancing entrepreneurial climate, retaining businesses in a community, developing and accelerating growth in a local industry besides diversifying local economy. Incubation mechanism creates successful start-up ventures, which graduate from the conducive incubation programs with financially viable and freestanding status. National Business Incubation Association (NIBA), USA is the world's largest association in the field of business incubation. Besides NIBA, there are several other business incubator related professional bodies, agencies and associations that are contributing to the field. Some of them include UK Business Incubation Association, European Business and Innovation Center Network, International Association of Science Parks (IASP), German • Association of Innovation Technology and Business Incubation (ADT), France Techno polis Enterprises Innovation (RETIS), etc. India also has its own professional association of business incubators such as 'Indian Science and Technology Entrepreneurs Parks and Business Incubator Association' (ISBA). Business incubators have their specific strategic mechanisms, which help to create an entrepreneurial ecosystem in a conducive Incubation Mechanism.

History and Growth of Incubation Mechanism: The concept of business incubation mechanism began since the USA in 1959 when Joseph Mancuso opened the Batavia Industrial Center in a Batavia, New York, warehouse. Incubation expanded in the U.S. in the 1980s and spread to the UK and Europe through various related forms The U.S.-based International Business Innovation Association estimates that there are about 7,000 incubators worldwide. A study funded by the European Commission in 2002 identified around 900 incubation environments in Western Europe. Incubation activity has not been limited to developed countries; incubation environments are now being implemented in developing countries and raising interest for financial support from organizations such as UNIDO and the World Bank. Researchers highlighted the role of start-ups, and entrepreneurially motivated small business in the job creation as highly correlated and this positive relationship fastened the growth of incubation movement. The second phase of business incubation mechanism was between 1980's and 1990's, during which several multi-purpose mixed use models along with specialized business incubation were developed in the US and Europe. According to NBIA (2015), public-private sector activities encouraged incubation in the second phase (1980-90s) that included various activities. Small Business Administration conducted a series of regional conferences, workshops to bring awareness about incubation during the mid-1980s. In the third phase (late 1990s, 2000 & beyond) of business incubation history, the world society witnessed the massive introduction of internet based virtual incubators, technology-based incubators, innovation centers integrated with science parks, etc. which were the prominent signs of modern incubators. Many types of business incubation mechanisms were developed as an impact-making economic development tool intended for innovation-based high growth start-up development.

Business Incubation Mechanism in India: In India, approximately 120 business incubators are functioning, among which 59 TBIs are promoted by National Science & Technology Entrepreneurship Board of DST, Government of India. About 40 are software technology parks promoted by Ministry of Information and Communication and government and non-government bodies (NSTEDB) promote others. The broad focus area of Indian incubators operation sponsored by NSTEDB include information and communication technology, biotechnology, new material including Nano technology,

instrumentation and maintenance, manufacturing and engineering, design and communication, health and pharmacy, agriculture and allied fields, energy and environment. The functioning mechanism of Indian incubators occurs in a synchronized manner, which has helped to create an entrepreneurial ecosystem. There are various schools of thoughts for business start-up incubation with diverse portfolio of mechanisms. Hence, it is of importance to understand the different steps or phases involved in start-up cycle of a business venture so that appropriate business incubator intervention may be administered for better result. Business incubators are designed to nurture & facilitate the development of newly formed entrepreneurs by providing them with an array of targeted business groups and resources, which include: management improvisation, technical assistance, consulting, appropriate work space, shared basic business culture and equipment, networking support, marketing assistance, and financing necessary for company growth and development. The most common goals of incubation process are to improvise the survival and growth of new Start-ups in a conducive incubation mechanism. And to create employments and wealth, enhance entrepreneurial opportunities, create and retain innovation, commercialize new technologies, accelerate growth of startups to diversify economies.

‘START-UPS’ A Gateway in a Conducive Incubation Mechanism: Business incubation as a concept evolved through different practices for the development of high growth, technology-driven, scalable start-up/venture creation worldwide. It is important to evaluate the performance of these mechanisms. Despite the increase of the number of business incubators worldwide, there has been no single framework to understand, track and assess the effectiveness of its functioning.

The practice of incubation mechanism suggests that business incubators enact business incubation and venture capital organizations to facilitate the entrepreneurial process. Incubators combine technology, capital and know-how to leverage entrepreneurial talent and accelerate the development of new companies. Entrepreneurs in developing business and marketing plans, obtain venture capital. In addition, provide access to professional services besides helping them in the commercialization process of the technology. Incubators also provide flexible office space, administrative services, information technologies and specialized equipment. In an ideal situation, start-up ventures become independent and self-sustaining businesses after completing the incubating period with the incubators. However, in reality, many incubators deviate from the mission statements they had put forward initially and thus fail to provide the essential incubation and support services. Hence, they failed to deliver the financial or economic commitments to their investors. Some incubators have a tendency to venture into an industry they are less aware of while few others end up exploiting entrepreneurs only for future financial returns. Now worldwide, state and funding agencies are quite enthusiastic about establishing incubation facilities such as technology centers, business incubators, science parks, etc. Innovation in the knowledge economy in the information age is important as it leads to value creation, cost reduction, resource optimization, etc.

Start-up ecosystem dynamics: A start up ecosystem is composed by people, startup ventures in their various levels and various distinct in an institution in a location (physical/virtual) communicating as a system to create new startup companies. These institutions can be further divided into : universities, funding organizations, support organizations (like incubators, accelerators, co-working spaces etc.), Research organizations, service provider organizations and large corporations. Different institutions typically focus on specific set of the ecosystem functioning and/or startups at their specific development stage(s). The elements of startup ecosystem facilitate ideas, inventions and researches ,entrepreneurs ,start-up team members Angel investors, start-up mentors ,start-up advisors, other entrepreneurial minded people.

Conclusions and Scope for Future Research: The dynamic environment intends to facilitate the role of Conducive Incubation mechanism as a modern entrepreneurship development tool, which supports the creation, and growth of start-ups worldwide. This conceptual study shows that over the last half century, 'business incubation mechanism' as a concept has evolved and contributed to different aspects of economy in different nations while the incubation mechanism matured only at the advent of the twenty-first century. A closer look at last four decade of business incubation literature shows that that focus of research were mostly related to (a) Incubation concept, facility design, and models and (b) Incubator performance assessment and benchmarking of best practices. Assessment of incubators evolved as a controversial and complex task, and this conceptual study was an attempt to identify a few gaps and research questions for the evaluation of business incubators. The current study is intended to conceptualize and raise a few ideas for further study. Future studies may focus on the following: to investigate the investment attractiveness among graduating business incubation tenants; to track the rate of survival and growth of business incubation supported enterprises; and to investigate the innovation adoption pattern with reference to the types of host incubators further research and most important to support the creation and growth of start-ups worldwide.

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A STUDY ON DEMONETIZATION IMPACT ON BANKING ONLINE TRANSACTIONS

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Abstract: The present study has been emphasized on online banking transactions during the demonetization period in India. Demonetization effect has been observed on various segments including citizen's usage of online transactions to overcome the liquidity crunch, the present study has been emphasized on 100 days data which includes 50 days before demonetization, 50 days after demonetization. On the secondary data the correlation analysis has been applied between money in circulation and selected online banking transactions and observed negative relationship with money in circulation to selected online transactions. The linear regression has been applied on Granger casualty test result variables and found significant influence on all the banking transactions i.e., before demonetization, During demonetization, the study found due to the demonetization the usage of online transaction got increased many folds in volume wise this study is useful to the regulators, banks and citizens.

Key Words: Demonetization, Banking transactions, IMPS, NEFT, RTGS and POS.

Introduction: Demonetization is the combination of two words De-Monetization where monetization means conversion of object into money, here demonetization refers to cancelation of old currency and issuing new currency in place of old currency. Demonetization has implemented so far in 9 countries. Demonetization has taken into action several times in India but, the step taken by P.M Narendra Modi and the Governor of the Reserve Bank of India (RBI), Urjit Patel made a press release on 8th Nov 2016 detailing on the procedure of exchange of 500 & 1000 notes with old 500 & 2000 notes which are to be exchanged In the span of 50 days which has influenced on ordinary citizen and forced them to use digital transactions.

Online banking, is also known as e-banking or virtual banking or internet banking it is an electronic payment system enables customers of a bank or other financial institution that led to conduct financial transactions through websites by the financial institution's. The online banking system is typical to connect or be part of core banking system operated by the banks and financial institutes in contrast to branch banking which is the traditional way customers accessed banking services. To access the financial institutions online banking facilities, a customer must register with the institution for the service and internet access helps as a mediator between customer and the financial institution, and set up a password and other credentials for further customer verification. The credentials for online banking system are normally not same as for mobile banking. The financial institutions allocate customers numbers, and know whether customers have intention to access their Net banking facility. Customer numbers normally will not be the same as account number, because the number of customer account can be linked to the one customer number. Technically, the number of customer can be linked to any other accounts with financial institution the customer controls the financial institution through limited the range of accounts that can be accessed for savings, cheque, credit card, loan and similar accounts. Fund flow is a statement of all cash inflow that related with outflows of various financial assets. Fund flows usually measured monthly or quarterly basis. The funds or assets are not taken into account when the share purchases and share Redemptions, the inflow and outflow creates excess cash for managers to invest and create demand for securities such As bonds and stocks.

Review of Literature: Dr. K. Mariappan(2016): Issues and Challenges of Demonetization faced by Government of India in the year 2016 and created new hope for economic development in India and the role in global economic system. This affected the poor, middle and upper middle classes people in higher rate because money in circulation is less for clearing transaction in Indian economy with original currencies for the welfare of Indian economy.

Geeta Rani(29.11.2016) : This paper throws light on the problems faced by shopkeepers and it affected their brand sales and post effects of demonetization and how consumers shifted to cashless means of payments.

B.Gayathri and K.Rajini(2017) : The objective in the paper speaks about India to be free from corruption, restrain black money, control over escalating price rise, to stop the funds that used for illegal activity, make people accountable for every rupee and pay income tax return. Finally, study suggested the make the cashless society and creates a Digital India.

Anil Ramdurg, Dr. Basavaraj (Dec 2016): This article made how the tool of Demonetization can use to eradicate parallel economy. Demonetization is the big step initiated by Government in addressing the various problems and issues like counterfeit currency, black money, corruption, tax evasion, Swiss bank terrorism etc..

Dr. Ambalika Sinha, Divya Rai (Nov 2016): This paper mainly focuses on the general implications of rural people during demonetization period. The chaos created in every stage of the society whether lower, upper or middle class. But this move was the informal sector in Indian economy, where only cashless transactions are

minimal. Most sectors in Indian Economy are informal which includes nearly 106 activities like workers in construction, agriculture, local transport, community services, small workshops, shoe makes and garment makers.

Objectives of the study.

- To study the relationship between the money in circulation with selected banking online transactions during the demonetization period.
- To study the influence of money in circulation on selected banking online transactions.
- To examine the future growth movement of banking online transactions based on money in circulation.

Hypotheses of the study:

H0: There is no relationship between the money in circulation with the selected online banking transactions.

H0: There is no influence of the money in circulation on the selected online banking transactions.

Scope of the study:

The study has emphasized from 20.sep.2016 to 19.Feb.2017 the present study will consider on Money in circulation with online banking transactions. The study is bifurcated into two segments i.e., before demonetization period and after demonetization period. The online banking transactions data has been considered from RBI i.e., Money in circulation (cash), RTGS (Real time gross settlement), NEFT (National electronic fund transfer), IMPS (Immediate payment service), POS (point of sale), Mobile banking, NACH (National Automated Clearing House)

Research Methodology: The present study has been emphasized on secondary data by using descriptive statistical tools. The following variables have been considered for the study and applied various statistical tools according to the objectives.

Augment dickey fuller test (ADF): This test is used to understand the basic underlying concept of the Dickey-Fuller test at certain conclusions then jump to augmented Dickey-Fuller test (ADF) it is just an augmented version of original Dickey-Fuller test.

Correlation: Correlation is a statistical too; that show how strongly variables are related.it is one of the most commonly used statistical tool. A correlation describes the degree of relationship between two variables.

$$Y_t = \beta_1 + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \dots + \beta_k X_{kt} + u_t$$

Granger Causality Tests- E views software: The Granger causality test determines whether one time series is helpful in forecasting another. Granger causality in economics could be tested for measuring the ability that predicts the future value of a time series using prior values of another time series.

$$Y_t = a_0 + a_1 Y_{t-1} + \dots + a_p Y_{t-p} + b_1 X_{t-1} + \dots + b_p X_{t-p} + u_t \quad (1)$$

$$X_t = c_0 + c_1 X_{t-1} + \dots + c_p X_{t-p} + d_1 Y_{t-1} + \dots + d_p Y_{t-p} + v_t \quad (2)$$

Linear regression: Linear regression is the relationship between two variables (scalar dependent variable and explanatory independent variable).

Vector auto regression- Eviews software: An econometric model used for the linear interdependencies among the time series. VAR model generalize the univariate autoregressive model (AR model) which allows for more than one variable.

$$yI = c(I) + c(II)*yI(-1) + c(12)*yI(-2) + \dots + c(2I)*xI(-1) + c(22)*xI(-2) + \dots + \dots$$

Data Analysis: To study the relationship between the money in circulation with selected banking online transactions during and after demonetization period.

Table no:1							
Before Demonetization							
	DDCINCB	DDMBANKB	DDCARD SB	DDNACHB	DDIMPSB	DDNEFTB	DDDDRTGSB
DDCINCB	1						
DDMBANKB	0.01840	1					
DDCARD SB	0.00163	0.009864	1				
DDNACHB	0.02897	-0.02554	-0.02829	1			
DDIMPSB	-0.00106	-0.04699	-0.04555	0.02579	1		
DDNEFTB	0.00420	0.01561	0.046405	-0.0313	-0.04579	1	
DDDDRTGSB	0.04806	-0.04864	-0.04596	0.074357	0.049943	-0.03947	1

Source: Compiled through E-Views version-6

The above table 1 of correlation result indicates between the money in circulation and online banking transactions before demonetization period, it is that the IMPS is negatively correlated with in money in circulation, the rest of online banking transactions are positively correlated with money in circulation.

Table no:2							
After Demonetization							
	DDCINCA	DDCARDSA	DDMBANKA	DDNACHA	DDIMPSA	DDNEFTA	DDDRTGSA
DDCINCA	1						
DDCARDSA	0.005061	1					
DDMBANKA	-0.04063	0.006668	1				
DDNACHA	0.013554	0.009756	0.048768	1			
DDIMPSA	-0.04843	0.013187	0.009808	0.042424	1		
DDNEFTA	0.004526	0.009785	0.006128	0.097968	0.045693	1	
DDDRTGSA	0.494708	-0.04979	-0.03154	-0.04407	-0.02192	-0.02799	1

Source: Compiled through E-Views version-6

The above table 2 of correlation result indicates between the money in circulation and online banking transactions after demonetization period, it is indicated that the IMPS and Mobile Banking are negatively correlated with in money in circulation, the rest of online banking transactions are positively correlated with money in circulation.

To study the influence of money in circulation on selected banking online transactions.

Table no:3			
RTGS			
Null Hypothesis:	Obs	F-Statistic	Prob.
DDDRTGSA does not Granger Cause DDCINCB	8	2.68025	0.2149
DDCINCB does not Granger Cause DDDRTGSA		0.64124	0.5863

Source: Compiled through E-Views version-

The above table 3 analysis of Granger causality of null hypothesis indicates that the probability is observed 0.58 greater than 0.05 hence the null hypothesis has been rejected and alternative is accepted. It indicates that the money in circulation is having the influence on RTGS.

Table no:4			
NEFT			
Null Hypothesis:	Obs	F-Statistic	Prob.
DDNEFTB does not Granger Cause DDCINCB	8	0.21837	0.8156
DDCINCB does not Granger Cause DDNEFTB		0.74524	0.5461

Source: Compiled through E-Views version-6

The table no. 4 analysis of Granger causality of null hypothesis indicates that the probability is observed 0.54 greater than 0.05 hence the null hypothesis has been rejected and alternative is accepted. It indicates that the money in circulation is having the influence on NEFT.

Table no:5			
IMPS			
Null Hypothesis:	Obs	F-Statistic	Prob.
DDIMPSB does not Granger Cause DDCINCB	8	0.35907	0.7248
DDCINCB does not Granger Cause DDIMPSB		2.43355	0.2355

Source: Compiled through E-Views version-6

The above table no. 5 analysis of Granger causality of null hypothesis indicates that the probability is observed 0.23 greater than 0.05 hence the null hypothesis has been rejected and alternative is accepted. It indicates that the money in circulation is having the influence on IMPS.

Table no:6			
NACH			
Null Hypothesis:	Obs	F-Statistic	Prob.
DDNACHB does not Granger Cause DDCINCB	8	1.00809	0.4625
DDCINCB does not Granger Cause DDNACHB		0.06574	0.9377

Source: Compiled through E-Views version-6

The above table no. 6 analysis of Granger causality of null hypothesis indicates that the probability is observed 0.93 greater than 0.05 hence the null hypothesis has been rejected and alternative is accepted. It indicates that the money in circulation is having the influence on NACH.

Table no:7			
POS			
Null Hypothesis:	Obs	F-Statistic	Prob.
DDCARDSB does not Granger Cause DDCINCB	8	0.15176	0.8654
DDCINCB does not Granger Cause DDCARDSB		1.28495	0.3953

Source: Compiled through E-Views version-6

The table no. 7 analysis of Granger causality of null hypothesis indicates that the probability is observed 0.39 is lesser than 0.05 hence the null hypothesis has been accepted and alternative is rejected. It indicates that the money in circulation is not having the influence on POS (CARDS).

Table no:8			
Mobile banking			
Null Hypothesis:	Obs	F-Statistic	Prob.
DDMBANKB does not Granger Cause DDCINCB	8	0.09058	0.9158
DDCINCB does not Granger Cause DDMBANKB		0.83279	0.5156

Source: Compiled through E-Views version-6

The above table no. 8 analysis of Granger causality of null hypothesis indicates that the probability is observed 0.515 greater than 0.05 hence the null hypothesis has been rejected and alternative is accepted. It indicates that the money in circulation is having the influence on Mobile Banking.

AFTER DEMONETIZATION

Table no:9			
RTGS			
Null Hypothesis:	Obs	F-Statistic	Prob.
DDDRTGSA does not Granger Cause DDCINCA	7	0.22711	0.8149
DDCINCA does not Granger Cause DDDRTGSA		0.12501	0.8889

Source: Compiled through E-Views version-6

The above table no. 9 analysis of Granger causality of null hypothesis indicates that the probability is observed 0.88 greater than 0.05 hence the null hypothesis has been rejected and alternative is accepted. It indicates that the money in circulation is having the influence on RTGS.

Table no:10			
NEFT			
Null Hypothesis:	Obs	F-Statistic	Prob.
DDNEFTA does not Granger Cause DDCINCA	8	0.18382	0.8408
DDCINCA does not Granger Cause DDNEFTA		0.01591	0.9843

Source: Compiled through E-Views version-6

The above table no. 10 analysis of Granger causality of null hypothesis indicates that the probability is observed 0.98 greater than 0.05 hence the null hypothesis has been rejected and alternative is accepted. It indicates that the money in circulation is having the influence on NEFT.

Table no:11			
IMPS			
Null Hypothesis:	Obs	F-Statistic	Prob.
DDIMPSA does not Granger Cause DDCINCA	8	0.43979	0.68
DDCINCA does not Granger Cause DDIMPSA		1.64497	0.3294

Source: Compiled through E-Views version-6

The above table no. 11 analysis of Granger causality of null hypothesis indicates that the probability is observed 0.32 greater than 0.05 hence the null hypothesis has been rejected and alternative is accepted. It indicates that the money in circulation is having the influence on IMPS.

Table no:12			
NACH			
Null Hypothesis:	Obs	F-Statistic	Prob.
DDNACHA does not Granger Cause DDCINCA	8	0.0413	0.9601
DDCINCA does not Granger Cause DDNACHA		0.05601	0.9465

Source: Compiled through E-Views version-6

The table no. 12 analysis of Granger causality of null hypothesis indicates that the probability is observed 0.94 greater than 0.05 hence the null hypothesis has been rejected and alternative is accepted. It indicates that the money in circulation is having the influence on NACH.

Table no:13			
POS			
Null Hypothesis:	Obs	F-Statistic	Prob.
DDCARDSA does not Granger Cause DDCINCA	8	0.03982	0.9615
DDCINCA does not Granger Cause DDCARDSA		0.00016	0.9998

Source: Compiled through E-Views version-6

The table no. 13 analysis of Granger causality of null hypothesis indicates that the probability is observed 0.99 greater than 0.05 hence the null hypothesis has been rejected and alternative is accepted. It indicates that the money in circulation is having the influence on POS (CARDS).

Table no:14			
Mobile banking			
Null Hypothesis:	Obs	F-Statistic	Prob.
DDMBANKA does not Granger Cause DDCINCA	8	0.27695	0.7756
DDCINCA does not Granger Cause DDMBANKA		0.83438	0.5151

Source: Compiled through E-Views version-6

The table no. 14 analysis of Granger causality of null hypothesis indicates that the probability is observed 0.51 greater than 0.05 hence the null hypothesis has been rejected and alternative is accepted. It indicates that the money in circulation is having the influence on Mobile banking

BEFORE DEMONETIZATION

Table no:15			
Model	Standardized Coefficients Beta	R	Sig.
(Constant)	16628.02	0.753	0.00
RTGS	1.408	0.631	0.00
NEFT	0.497	0.685	0.00
IMPS	0.708	0.865	0.00
NACH	-1.622	0.894	0.00
POS	-2.221	1.00	0.00
MBANKING	0.243	0.652	0.00

Dependent Variable: currency in circulation

Source: Compiled through SPSS version-20

The above table no. 15 analysis of linear regression model has been applied on fund flow s through electronic mode that is online banking and money in circulation with public the beta coefficient value reflects that RTGS has got influenced very high in positive way by the money in circulation comparing with other online transactions the NACH and POS are negatively influenced by the money in circulation before demonetization.

AFTER DEMONETIZATION

Table No: 16

Model	Standardized Coefficients Beta	R	Sig.
(Constant)	5.2	0.852	0
RTGS	4.768	0.774	0
NEFT	1.678	0.783	0
IMPS	-3.707	0.637	0
NACH	7.522	0.699	0
POS	-3.456	0.715	0
M_BANKING	-8.342	0.685	0

a. Dependent Variable: currency in circulation
Source: Compiled through SPSS version-20

The above table no. 17 analysis of linear regression indicates the result after demonetization period the beta coefficient value result indicated i.e., IMPS and POS are negatively influenced by the money in circulation the other online banking transactions after demonetization period is observed to be positively influenced by the money in circulation.

To examine the future growth movement of banking online transactions based on money in circulation. Table no:17

	DDCINC D	DDCARDS D	DDMBANK D	DDDNACH D	DDIMPS D	DDNEFT D	DDRTGS D
DDCINC(-1)	-0.663175	-4.09E-05	-6.88E-05	0.000103	-8.90E-06	-3.48E-06	-0.00014
	-0.54348	-0.00013	-4.50E-05	-0.00035	-9.20E-05	-9.80E-05	-8.40E-05
	[-1.22024]	[-0.32712]	[-1.51799]	[0.29540]	[-0.09691]	[-0.03558]	[-1.72553]
DDCINC(-2)	-0.318298	0.000121	-0.000139	7.03E-05	-8.94E-06	-1.07E-05	-5.98E-05
	-0.5453	-0.00013	-4.50E-05	-0.00035	-9.20E-05	-9.80E-05	-8.10E-05
	[-0.58371]	[0.96086]	[-3.06662]	[0.20015]	[-0.09738]	[-0.10944]	[-0.74120]
DDCARSD(-1)	69.07336	0.302419	-0.000568	-0.45216	-0.01128	0.079502	-0.05074
	-906.038	-0.20847	-0.00236	-0.27826	-0.02168	-0.05907	-0.26223
	[0.07624]	[1.45066]	[-0.24098]	[-1.62495]	[-0.52002]	[1.34584]	[-0.19350]
DDCARSD(-2)	22.09552	0.308532	0.001716	-0.51112	0.000759	0.095362	-0.12484
	-429.612	-0.09885	-0.00113	-0.15672	-0.01037	-0.02699	-0.13326
	[0.05143]	[3.12124]	[1.51333]	[-3.26137]	[0.07320]	[3.53265]	[-0.93681]
	252.9899	-0.032776	0.705515	1.407018	0.674006	0.511838	-0.21315
	-3722.55	-0.85652	-0.21363	-1.60518	-0.43773	-0.50087	-0.34865
	[0.06796]	[-0.03827]	[3.30252]	[0.87655]	[1.53979]	[1.02190]	[-0.61136]

Source: Compiled through E-Views version-6

The above analysis on vector auto regression model has been applied to predict the future movement of online banking transactions based on money in circulation and observes that coefficient values of POS (cards) are expected to increase in near future after demonetization period because the coefficient value is observed in positive. The coefficient values of Mobile Banking are expected to increase in near future after demonetization period because the coefficient value is observed slightly change in negative towards positive. The coefficient values of NACH are expected to increase in near future after demonetization period because the coefficient value is observed in positive. The coefficient values of IMPS are expected to decrease in near future after demonetization period because the coefficient value is observed slightly change in negative. The coefficient values of NEFT are expected to increase in near future after demonetization period because the coefficient value

is observed slightly change in negative towards positive. The coefficient values of RTGS are expected to decrease in near future after demonetization period because the coefficient value is observed in negative.

Findings

- The correlation of Money in circulation with IMPS is slightly negatively correlated (-0.00106).
- The NACH is negatively correlated (-0.08269) during the demonetization period where other online banking transactions have positively influenced.
- The correlation after demonetization has observed IMPS and Mobile Banking to be negatively correlated (-0.584 & -0.506).
- The granger causality test indicates money in circulation had influenced on all the online banking transactions the probability value of null hypothesis is observed to be greater than significant value(0.05).
- The linear regression of fund flows between money in circulation and online banking transaction before demonetization it is observed that the beta coefficient value of RTGS influenced positively very high.
- The result of liner regression after demonetization shows negative influence on IMPS & POS by money in circulation.

The residual test indicates, during the demonetization period Nifty volatility has been measured the trend line indicated that it has breached the fitted line hence the graph states that the Nifty volatility got influences by the online transaction amount along with various unknown variables during the demonetization period.

Conclusion: The present study concludes the title of demonetization effect on online transactions the study has been bifurcated in three different periods i.e., before demonetization period, during demonetization period and after demonetization period. The implementation has been initiated by Government of India with the help of current banking system from 10.Nov.2016 to 31.Dec.2016. The present study has considered online transactions which are routed through RBI, The study result indicated due to the demonetization volume of online transaction of banking. Transactions of banking segment had increased enormously during and after demonetization period compared with before demonetization. The reduction of money in circulation obviously will have a positive influence on various modes of online transactions in the present study six different online transactions were considered and observed POS had influenced by money in circulation negatively in all three different periods . Hence there is a need to do research in future by considering the various economic parameters and technology influence on citizens and online transactions. This may give more accurate information so that the RBI can take proactive measures to implement the effective digitalization in banking sector.

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THE FUTURE OF BITCOIN: A CROSS-COUNTRY PERSPECTIVE

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Abstract: The article emphasizes on the Bit coin, which is an emerging digital currency. It is a peer to peer electronic cash system. Bit Coin is a digital asset, which makes use of Cryptography to secure the exchanges made in a transaction, without the use of a Central bank. A cross-country study has been undertaken to elicit the views of the respondents on their knowledge on bitcoin as a currency. The pros and cons, challenges have also been added through a review of literature on the subject. The article concludes with comprehensive conclusions.

Introduction: The name Bit Coin came into the picture in 2009, through which several other Crypto-currencies came into existence. In the early days of the Bit Coin, the founder Nakamoto estimated to have mined over 1 million Bit Coins. Bit Coin is a decentralized currency that does not belong to any country. The purpose of creating the Bit Coin was to replace trust from the centralized institutions to code base and Cryptography. This mode of transfer is independent of transaction fees and is instantaneous with a certain other benefits through its decentralized form. The transfer of assets are digitally signed and quite secure, after which a miner verifies the transfer and the transaction is deemed complete. Bit Coins also exist in solid form

Objectives of the Study:

The objectives of the study are to:

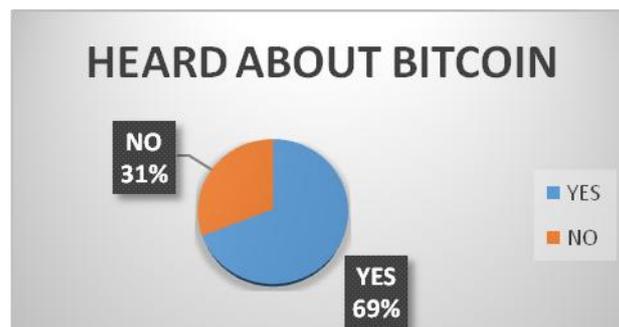
1. Throw light on the conceptual framework of bitcoin in the present day situation.
2. Analyze the pros and cons of bitcoin and whether it is a relevant channel of exchange.
3. Visualize the various challenges in using bit coin and make relevant suggestions.

Research Methodology:

Sample size: A sample size of around 50 respondents across India and Australia were collected randomly from students, consumers and employees of organizations to elicit their views on the future of bitcoin. Simple averages and diagrams were prepared and interpreted in the study

Past, Present and Future of Currency: Through the years, humans have created several ways for exchange of their assets. The early human used the Barter system to exchange goods and services. As years passed, humans started making use of currency or gold for their exchange in goods and services. This currency was in physical form which held a certain prominence that was created by a society. Through the years, as computers and digital technology emerged, the use of digital money came to play a significant role in the societies throughout the globe. The use of digital money encouraged international trade and commerce. Many companies who intended to make it on the global market had made their plans come to fruition. The countries that were active in trade held a strong currency. Then later on, modes of investments like stocks and other securities came into the picture. Bit Coin was just another form of digital currency, but it certainly grew to prominence. This system of payment is accepted world-wide. The cost of one Bit Coin is almost costlier than a middle-class individual's car. Although a few people have a perception that this currency is fruitless, the lot that are willing to spend have found the Bit Coins to be quite profitable. There is a mining profitability calculator that helps project profitability based on external and internal factors. This calculator helps a buyer derive his return from the market.

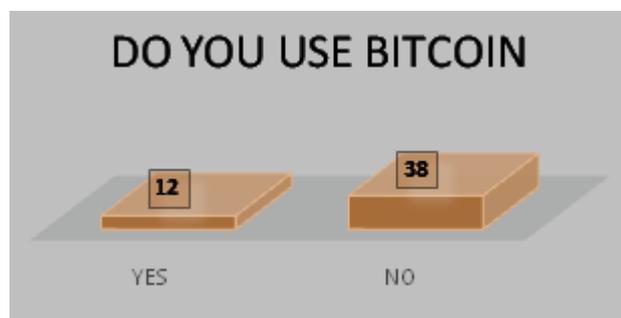
Analysis and Interpretation: Primary data was collected using 50 respondents from India and Australia. There are various aspects that have been covered in the survey such as having a knowledge of using bitcoin, Governments role in favoring it as a currency and other aspects have been analyzed from the questionnaire. Bit coin being the talk of the town, on a scale where developed countries consider it as a legal tender, the article intends to portray the popularity of the Bit coin among the developing countries, and it was found that 69% of the population, heard about Bit coin whereas the rest 31% were left out to acquaint with it.



In the era, where the transactions have experienced a shift in preference to e-payments. It was curious to know, if Bit coin will be the next level of Payments as they are completely virtual coins that were designed to be 'self-contained' for their value, with no need for banks to move and store the money. To understand this, we asked the respondents to opionate the strength of Bitcoin as a future currency. We received a mix response of 36% of respondents stating a bright future, whereas 42% and 22% of them responding it to be not so effective and shall decline respectively.



Though Bit Coin has been a recent phenomenon, it is not used by many. The survey undertaken shows that 24% are already the users of Bit Coin as a measure to make payments, whereas 76% are yet to implement it. It is also believed that there shall be an increase in usage of this mode, as there has been a plunge of 50% in the past 13 trading days.



On one hand Bit coin is plunging into the market as a cryptographic currency on the other hand, some of them have an opinion of it to be a fraud. In such a case, a question arises, will the government take the stage and promote this currency or not. On this, we received a 48% of the population saying a yes and 52% of population supporting a no. Being in the infancy stage, the Bit coin needs time to be considered as a reliable source and its complete set of benefits are yet to be unveiled for the government to acknowledge the need for it as a source of payment for the coming generation.

The Pros of Using Bitcoin: Bit Coins are free of any third-party interruptions. The government cannot freeze any transaction of any Bit Coin user, the user has full control. Under dire circumstances, the user may lose control of his assets only if the bit coins are transferred to another person. Bit Coins are not bound to any countries tax system and a Bit Coin tax system does not exist. Bit Coins are free of third party service providers, which means it is free of any unnecessary transaction costs. The Bit Coin client needs to be connected to the nodes, while receiving or sending Bit Coins. By using Bit Coins, the users are sharing the burdens of transactions and contributing to the network. By doing so they ameliorate the burden of paying transaction costs. Bit Coin users have a highly secure wallet system, where nobody except the user know the details of the amount of money they own. Unless the wallet owner shares the details of their wallet and make it public, no one will ever know the wallet address of the owner. Simultaneously, the wallet address can be changed after the address was publicized. This helps the user benefit from privacy of the Bit Coin service. Transactions can be made without the knowledge of any external party and are completely safe from hackers. Unlike currency systems, Bit Coins require more than a few details to gain access to the finances of an individual. The user can only lose his wallet address, if someone physically gains access to the computer of the Bit Coin user. This makes it hard to steal and secure with privacy, which the currency financial system lacks. The Bit Coin transactions are completely mobile, which means the user can gain access to his account from any place around the world, with the help of an internet connection. Instead of physically going to a bank to access their account, the user can quickly gain access to their assets via the internet and is still secure and safe. The Bit Coin transactions give its users complete anonymity and allows them to complete their transactions in complete discretion. It utilizes the block chain technology which enables it to have a built-in security protocol.

The flipside of Using Bitcoin: The Bit Coin system has always been susceptible to hacks and scams. The way Bit Coin is sold is a complete scam. It is not supported by any government agency nor follows any countries laws. It is free of the tax system of itself or the government. Its saving policy in the recent years was an utter scam. Other Crypto currencies are less susceptible to hackers because they are less likely to have an increase in price or a demand at the moment. This is why the law enforcing agencies target Bit Coin servers to track any illegal activities. The mt.Gox collapse was a perfect example of a

fraudulent activity. A hacker caused a decrease in the Bit Coin, by hacking the auditor's computer and illegally transferring a number of Bit Coins to himself. (Mt. Gox)

Bit Coin's anonymity attracts illegal transactions, which include transactions from the black market and the dark web. Hence, it remains open to criminals and provides privacy to illegal traders. Because of this, the government agencies have decided to curb crime by tracking criminal activities. The IRS of the U.S government have spent \$88,000 on a Bit Coin tracking software to monitor the Bit Coin economy. This has been no secret to many people. Hence the privacy policy of Bit Coin is just a tale. (Tracking Software) Bit Coins cannot be refunded. Once a transaction is made, the money spent is gone forever. A transaction cannot be reverted or stopped mid-way. However, a miner records all transactions made. The miner is not qualified to judge the legality of these transactions. Bit Coins are on top of the pyramid of the crypto currencies. However, there are many more emerging crypto currencies that are in par with Bit Coin and are much better. If there is a crypto currency that is untraceable and completely anonymous, it would gain most of the demand from a large number of people. This crypto currency would confiscate the reputation and the power of Bit Coin in the market. Which in turn would cause a tremendous fall in the value of a Bit Coin. Bit coins are not widely accepted by all business. Most business consider it to be a shady means of currency. The only businesses using it are running in serious profits from Bit Coin trading. Until recently the Bit Coin trading has seen a terrible fall, this caused many traders to rethink the use of Bit Coin as means of currency. Governments may ban the use of Bit Coins for traders to track transactions and keep all transactions legitimate. The cost of a single Bit Coin is more than the savings of a middle class citizen. Once a Bit Coin Wallet is misplaced it is lost forever and cannot be recovered. This means if a person has been saving up some money since 5 years and later buys a Bit Coin, he would lose his 5 years of earnings and never get it back. Bit Coins face terrible instabilities in its price, which is according to the demand it faces. This causes an uncertainty to common. Investing in a Bit Coin would seem precarious, for a person who earns for a decent living.

The Challenges of Using Bitcoin: The concept of Bit Coin is a bit complicated. This is mainly because of the fact that, it is not controlled by a single entity. Bit Coins are created by a process called mining. Bit Coin miners are paid a certain amount for solving mathematical problems pertaining to the transactions of Bit Coins around the globe. This is the reason why transactions cannot be revoked after the payment is made. The infinite number of Bit coins have no specific physical billing or receipt system, for a layman this would seem to be worthless. The Bit Coins are almost as similar to any country's currency, but the difference with Bit Coins is that as it gets popular its value increases. Country to Country transactions have a fee instilled into them, this is the third party's service charges. For the Bit Coin however, there is a little or no transaction cost and the transaction is instantaneous. Just like a physical wallet the Bit Coin wallet allow you to store and keep money, as long as you like. Every user is given private keys to access this wallet, once a person loses the wallet and the key, it is lost forever. The private keys are mathematically related to all Bit Coin addresses generated for the wallet. Bit Coins are accepted by merchants and various other businesses world-wide, even though it may be a superficial currency to most businesses. (Bit Coin facts). To overcome the challenges of using a Bit coin, there are courses available online to understand the functionality and the Bit Coin market. These courses help a person earn an easy coin and understand the strategy of the Bit Coin. It is too early to predict the stability of Bit coin as a crypto currency, but currently there is a lot of skepticism due to its strong market resistance. Currently, countries like Korea and China propose to ban Bit coin and this rumor has spiraled a bearish trend across the world resulting in a drastic fall in the crypto market. In December 2017, RBI also had warned and cautioned holders of cryptocurrencies that it protect consumers and look into economic, operational and legal and security risks associated with the uses of cryptocurrencies. It had also clarified that it did not authorize licenses for any concern to trading in Bitcoin or any cryptocurrency.

Findings: Although the Bit Coin is advantageous to several businesses, it lacks in being accessible to every buyer. The cost of a Bit Coin is a deal-breaker to many people. Bit Coins would have more stability and profitability, if it had a better security and was available to the common man for a cheaper price. This would cause a stability in its market price and would not cause serious fluctuations. The survey had many respondents stating that the Bit Coin was beneficial, but a very few of them own a Bit Coin. This clearly states that the instability of the Bit Coin is causing many respondents to have a skeptical, yet a partly positive notion about the Bit Coin.

Conclusion: A number of factors such as global financial crisis, banks bail in tactics, demonetization and fluctuation in currencies have led to the invention of such crypto currencies. Bitcoins can facilitate global transactions, reduce the role of banks as it does not require conversion in foreign exchanges. The harsh reality is that the Bit Coin is better than the services provided by banks as an intermediary. If the stability factor was not a problem, people would prefer the Bit Coin instead of a foreign currency. Its continuity requires strong government's support and approval across nations. The slipshoddy treatment of this virtual currency has resulted in its being used for nefarious activities such as fraud, money-laundering or heists. This currency can be made more trust-worthy and reliable by establishing a globally accepted regulatory framework and a redressal forum which can streamline the currency. Moreover, the block-chain technology the powers virtual currencies, has a built in secure system, can check fraud and increase its credibility as a currency, thus projecting it as a currency of the future.

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E-PAYMENTS AND SECURITY ISSUES

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Abstract: The use of e-payments has been gradually increasing due to technological advancement. People have adapted to use of e-payments from traditional mode of payment. It decreases the overall time of transaction and deliver the faster payments to the users. E- Payments act as uniform payment mode across the globe. India is the second country in the world to adapt to e-payments. The payments methods like debit card, credit card, e-wallets are mostly accepted by merchants, vendors. E-wallet applications like paytm, tez, phonepe are the mostly used applications by majority of the people regardless of age. The security is the most important concern of the people which discourages them from adopting e-payments. The major threats like worms, Trojans which steal the data of the users. The threats can be avoided by using different security solutions like multiple authentications and biometrics will protect the users data. Demonetization had forced many individuals form paper currency to digital currency.

Key Words:Security, Applications, Solutions, Electronic Fund Transfer

Introduction:

Electronic Payment is a financial transaction which takes place between buyers and sellers electronically online without the use of actual cash or paper currency. Electronic payments are far cheaper than the traditional which makes it easier and more reliable and more adaptable to the people.

Objectives of the study

1. To understand the working of the e-payment based applications.
2. To understand the security aspects of the e-payment services.
3. To know the overall impact of e-payments on the economy.
4. To understand the adaptability of people from traditional paper currency to e-payments

History of money:

Barter System: It's is the oldest system where real goods are exchanged for goods.

Commodity Money: In this system, goods which have monetary value. E.g., Salt. Mostly it's gold & silver coins.

Commodity Standard: It uses the unique note with deposits of gold and silver held by the note issuer. Electronic Money: In this system, traditional currency give way to electronic money

Advantages of E-Payments:

- E-payments reduce the overall cost for businesses.
- Transacting via e-payments is very easy and convenient.
- Reduction of overall use of precious paper.
- There is an instant transfer of money, enables faster work completion.
- E-transactions can be done at any point in time.
- E-payments are accepted globally.

Disadvantages of E-Payments:

- Transaction fee per transaction and monthly fees are more.
- They are prone to hacking and other another online threat.
- Not all websites support a particular payment method.

E-payment system:

EFT utilizes computer and telecommunication components both to supply and to transfer money.

Classification of EFT:

EFT can be segmented into three broad categories

- Banking and financial payments
- Large-scale payments
- Small-scale payments
- Home payments
- Retailing payments
- Credit card
- Charge card
- On-line electronic commerce payments.
- Token-based payment systems.
- Credit card-based payments systems.

E-Payment modes:

Credit payment system:

Credit card: It's one of the e-payment method cards which are issued by the bank allowing the holder to purchase goods & services on credit basis with some other agreed charges. It involves a promise to pay the credit in future. It requires from capturing card information, approval from the issuer, payment of money, and monthly statement to the customer.

E-Wallet: E-wallet is an electronic device allows to make electronic transactions. It can be through the computer (Website) or the smartphone (Application). It stores the debit or credit card information of the user to facilitate a quick transaction. E.g., paytm, Tez app.

Smart card: Smart cards are the plastic card with microprocessors that can be loaded with funds to make a transaction. People usually used in places like Metro travelling, health cards, etc.

Cash Payment System:

Debit card: The holder of debit card instructs his bank to make a debt of an amount of transaction from his account for the payment of goods and services. The debit card only works if the holder has money in his mind to cover the transaction amount.

E-Check: E-check is a form of online payment where the money electronically transferred from payers account to the payees account upon the authorization. It takes 3-6 business days to complete. The merchant can withdraw payment for goods and services from the customer upon the approval by the customer.

E-Cash: E-cash simply is electronic cash or e-money that provides a way to pay for goods and services without the use of paper currency. It involves authorization, payment confirmation.

Security issues: Security is the central issue of the present-day scenario in making an electronic payment. Most of the security issues majorly found attacks of viruses, and Trojans. The viruses are spread through e-mails or any downloading unwanted content. Recently viruses are also spread through the apps like WhatsApp, Viber, etc. there many malicious programmes and viruses which can attach the online banking easily by stealing passwords on the browser.

Major Threat: Worms: Worms are the first viruses that are spread through direct internet connection where there is a direct connection and spread from one computer to another computer that usually steals the user's information. Trojans: Using the Trojans the hackers can bypass the authentication in e-payments. Trojans steal the confidential data or the sensitive data of the users.

Denial of services attack (DOS) or Distributed Denial of services (DDOS): It is another conventional method that disturbs the electronic payment system where hackers place the software on different third-party systems that sends request to the target systems (DOS) attacks generally targets the sights on the web's servers that might be a bank server. Phishing: It is a method that is used to obtain the personal information by acting as a trustworthy organization. Hackers send an e-mail from a good organization or a bank or a financial institution and try to get the information about the account details of the users. Once the user gives the required information unknowingly, then the hacker will gain access to the user's account. Pharming: it is a fraud that divers the internet connection of the user to a website which is exactly same. So, when the user enters the site that site will be a forged site. Drive-by Downloads: Drive-by download may happen when visiting a website or clicking on a particular link or an ad or popup. These are the clicked mistakenly by the users. The attackers create malicious content and can explore vulnerabilities. Drive-by download contains malware which is a significant thread to e-payments.

Solution: Authentications: An efficient authentication should be implemented for a better transaction through e-payment. Instead of single authentication, of authentication, should be performed for better security.

Multiple layers of authentication may be of a pin, cryptographic,

Biometrics: Biometrics are the security devices where the devisers check the person voice or finger pattern or eye retina for authentication which makes e-payments more secure and safe the biometric security devices or more likely to be in future.

Encryption: Encryption means the process of encoding and decoding a message. Encryption consists of encryption and decryption keys that allow the users to make secure payment encryption are used for secured and safe online transactions by the end to end encryption.

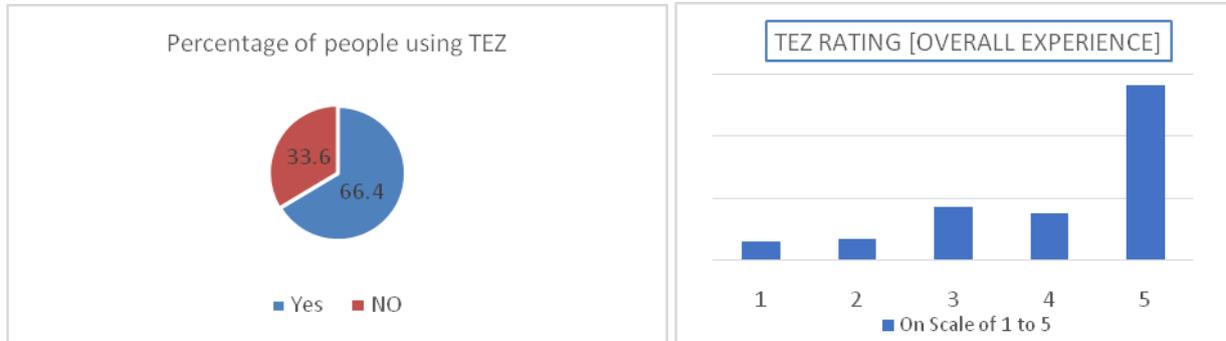
Firewalls: Firewalls are the security system which usually controls the incoming and outgoing traffic and blocks access for unwanted or untrusted files the file which has permission or given access to the system information by using the firewalls the e-payment security can be increased.

Analysis and Interpretation of the study: In order to find out the awareness of people on the subject of E-payments and security issues we have conducted a survey, consisting of 120 respondents. The questionnaire consisted of two parts, one part covered the various applications used and the second part covered the knowledge about e-payments. Various factors were covered in the questionnaire such as their opinion on e-payments, their knowledge on various applications .and the

effect of demonetization on e-payments. The following pages cover the analysis and interpretation conducted by the study. There are various e-payment based applications such as Tez app, Bhim app and phonepe.

The first application covered in the analysis is about Tez. Tez is a mobile payments service by Google, which targets the Indian market. It operates atop the Unified Payments Interface, developed by the National Payments Corporation of India. It can be used where UPI payments are accepted.

Table 1: People Using Tez



Tez works on the vast majority of India's smartphones, i.e., on Android ecosystem and iOS ecosystem with the Android app supporting English, Hindi, Tamil, and Telugu, etc. Table 1 reveals that 66% of those surveyed use this application, while 44% use other applications.

Table 2: people using bhim application

The next application used by the respondents is Bhimapp. Bhim App: Bharat Interface of Money was developed by NPCI which is a UPI based app. It was launched by Prime Minister Shri Narendra Modi in December 2016. It was named after Person whose chairman of the constitution drafting committee DR. Bhimrao Ramji Ambedkar. It also works on Android and iOS platforms.

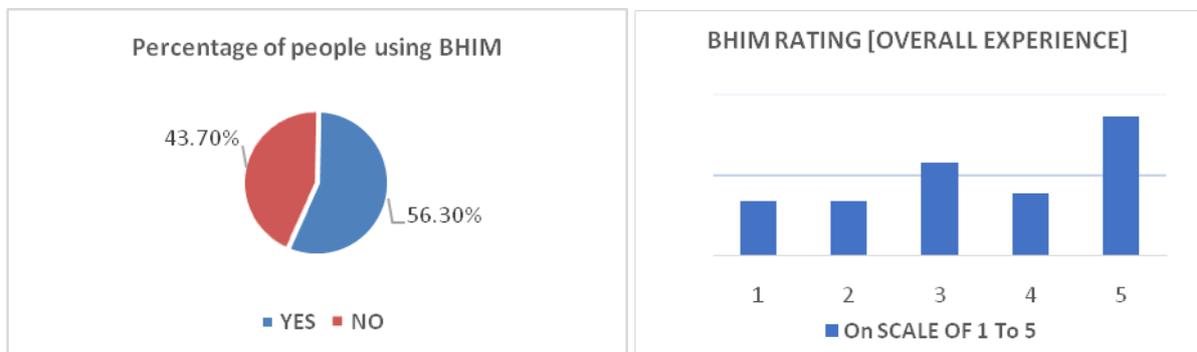


Table 2 reveals that 56% of surveyed people use Bhimapp and 43% use any other applications.

Table 3: people using phonepe application

The next application used by the respondents is phonepe application. PhonePe was introduced in 2015. Which became a UPI based app in partnership with YES Bank after it was taken over by Flipkart in 2016. It is also Android and iOS Application. RBI licensed it in August 2014.

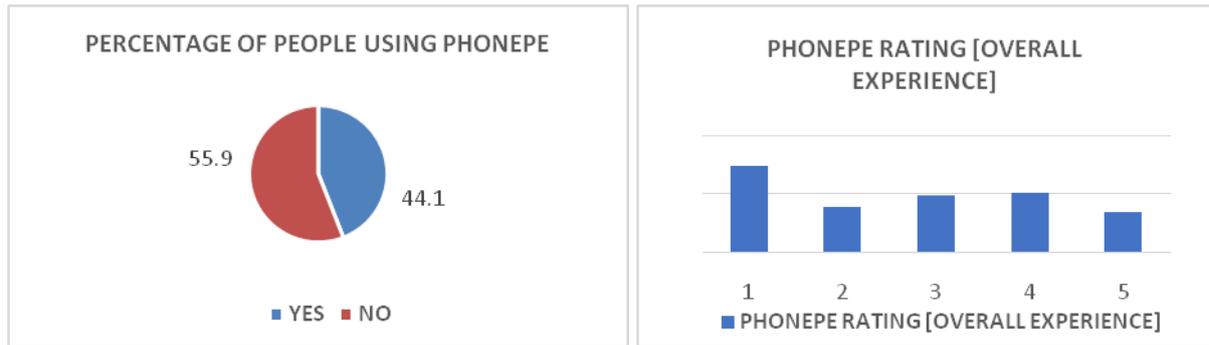


Table 3 reveals that 44% of the people use phonepe application and 56% use any other applications

Findings:

Majority of the people had preferred cashless for a cash transaction, i.e., 60.60% voted, and 39.40% voted against the cashless transaction.

From out of cash, M-wallets, & card payments. People preferred net banking at 40.9%.

Our research had revealed that out of 100% of respondents 60% of the people had no security issues and also mentioned that they're confident about the security. And rest 40% had some problems in the past.

People agreed that demonetization mainly pushed them towards cashless transactions.

Paytm is the app which is widely used by actively transacted by the people in the country, against its competitors Bhim, PhonePe, Tez with more than half of the votes, i.e., 65.70%.

When it comes to comfort ability concerning user interface, ease of transactions, majority people voted it positively around 62%, and rest felt more complicated.

Around 74.3% of the people are confident that e-payments have an impact on the Indian economy. And believe that it boosts the country's GDP.

Our survey also revealed that people had shifted from traditional bank money transfers to e-payment based monetary transactions, i.e., 51.40%. And rest believe that bank transfers to be safer.

There's a drastic change in people's behaviour and impact of e-payments its ease of doing it had enabled them to use e-payments for their daily payments like bills payment etc.

The ease of doing, security, reliability, etc. made people adapt to e-payments more quickly has majority voted positively.

Suggestions

The research paper revealed that people are unable to navigate through all the features provided and some had failed to use these services like Illiterates'. Some e-payment based applications need to work more on their UI and remove the complexity of the transaction .The security concerns arise more for the people while transacting online related explicitly to government banks. So, the government banks and the websites have to protect their customers online by safeguarding their sites by HTTPS to avoid stole of customers information. And protection while transactions take place.

E-payment is continuous process due to technological advances. The impact of the study is going to be directed towards future research.

Conclusion

E-payments based applications are driving India toward digitalization. Our study had found that e-payment applications are used by a large section of the people. The fear of security threat online is one of the factors which became a hindrance for the people to convert to cashless future. The impact of e-payments on Indian economy is high, which enables transparency regarding transactions taking place in the country, and directly contributes to the growth of the country. The ease of doing transactions, its reliability, timesaving factors is encouraging people towards e-payments.

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ROLE AND IMPACT OF FORENSIC ACCOUNTING

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Abstract: The main objective of this paper is to know the impact of Forensic accounting around the world, the services provided by it and to know the profession of forensic accounting. It is a combination of accounting, auditing and investigative skills to conduct an examination of company's financial statements. Forensic accounting seems to provide the needed solution to the problem of fraud and financial miss-management in corporate organizations. This article discusses the concept of forensic accounting, the need for it and its role in providing solution to the problem of fraud in corporate organizations.

Key Words:Forensic Accounting, Fraud, Corporate organization.

Introduction:

Financial crimes and frauds are old concepts in the world, but their solution – forensic accounting – is a relatively new one. The job demands reporting, where the accountability of the fraud is established and the report is considered as evidence in the court of law or in the administrative proceeding. It is a combination of accounting, auditing and investigative skills to conduct an examination of company's financial statements. Forensic accounting is used for fraud examination and fraud examination covers fraud allegations from inception to disposition, including obtaining evidence, interviewing, writing reports, and testifying. Forensic accountants are retained by law firms, corporations, banks, government agencies, insurance companies, and other organizations to analyze, interpret, summarize and present complex financial and business related issues in a simple and concise manner. Application of Forensic Accounting will be able to improve corporate governance fraud which will improve efficiency of corporate and non corporate sectors. It will be helpful in emphasizing the accounting and financial reporting system .

Fraud, as all of us know is the wrongful act of deception done willingly for a personal or to be more specific, financial gain; and the answer to this deep-rooted problems is forensic accounting which is the use of accounting skills to investigate fraud and financial crimes. Forensic accounting is the field which is called upon to address the issues investigation of white collar crimes.

Objectives:

- To study the impact of forensic accounting around the world.
- To know the services provided by forensic accounting.
- To highlight the problems of forensic accounting in India.
- To study the profession of forensic accounting.

Research Methodology: *Research type:* Descriptive Research

Data Base: Secondary Data/Data source. The present study is based on secondary data; information has been derived from various websites.

Forensic Accounting Around The World: Presently, committing fraud has become a part of carrying out business. Irrespective of the magnitude of the fraud committed, it is safe to say that majority of the business organizations commit fraud in some way. The Association of Fraud Examiners, mentioned in their Report to the Nations on Occupational Fraud & Abuse in 2012, that the world loses 5% of its annual revenue to fraud i.e., about \$3.5 trillion dollars.

Since fraud has such a huge impact over the world, there came a need to introduce something to curb fraud and that is when forensic accounting came into existence, in the early 1900s. Forensic accounting has been evolving ever since, by altering the way fraud is discovered and dealt with.

It has been observed that the introduction of forensic accounting has initially managed to at least curb the increases of fraud, if not reduce it altogether. People then began to locate loopholes due to which an increase in the number of frauds committed has been observed. Forensic accounting has been seen to have evolved in the way fraud is discovered and dealt with, which again managed to reduce the number of frauds committed people then began to locate loopholes, which again increased the number of frauds. This became a sort of an endless cycle until now. At present it is difficult to commit fraud and get away with it because the profession of forensic accounting has evolved to level by which fraud is detected as and when it is committed and the ones guilty of committing fraud, face serious consequences.

The services provided by Forensic Accountants are as follows

- Business valuations
- Divorce proceedings and matrimonial disputes
- Personal injury and fatal accident claims
- Professional negligence
- Insurance claims evaluations
- Arbitration

- Partnership and corporation disputes
- Shareholder disputes minority shareholders claiming
- Civil and criminal actions concerning fraud and financial irregularities – cross examination, formulate questions
- Fraud and white-collar crime investigations

Problems of Forensic Accounting : Although with the current economic downturn, there is an increased demand for forensic accounting services worldwide especially in developed countries, forensic accounting in developing economies is niche field. While Forensic Accounting developed as early as 1995 in USA, it put its first step in India just few years back (Ghosh 2011). In India Forensic accounting is still considered a new inclusion into the field of fraud detection. The dearth of qualified accountants with adequate technical know-how on forensic issues is one of the major problems of forensic accounting in India. Most of the corruption cases in India that have been unearthed recently, politicians and/or bureaucrats are involved. Due to the traditional judicial system and political compulsion, forensic accountants are facing the challenge of gathering information against such big shots that is presented in the court of law. The admissibility, of evidence in compliance with the laws of evidence is crucial to successful prosecutions of criminal and civil claims.

Moreover, it will be quite costly if the issues were brought to court and where it involves expert witnessing. Thus, most companies prefer to settle the issue outside the court to avoid the expensive cost and the risk of bad publicity on their corporate image.

India economy has been opened up to the world and some financial scandal involve corporate from other countries. Globalization of the economy and the fact that a fraudster can be based anywhere in the world has led to the problem of inter-jurisdiction. The fast-changing world of information technology and the exponential increase in the use of computer systems threaten the forensic accounting fraternity. Accountants with good experience may find it difficult to detect and prosecute computer related fraud.

Fraud-Current Model

There are four stages in the model shown in Fig.

The first stage:- fraud incident raises consciousness, while training and other prevention criteria are out of the question. In such an environment, a fraudulent event occurs. Then the company moves to crisis mode because it wants to identify the fraudster and is too eager to prevent the event from becoming known publicly, save losses, and reduce the impact of fraud on the organization.

The second stage:- is the investigation stage - All security procedures and internal control are included in this stage. Much of the investigation is conducted by interviewing and document examination. The investigation might not end up with a decision but could take long time and be costly at the end of the day.



In third stage begins, investigation is completed and the company decides how to take action against the fraud. There are four possible decision actions: do nothing, fire the fraudster, transfer the fraudster to another section, or fire the fraudster and start legal proceeding.

In fourth stage, the file is closed, the employee is changed, and new controls are applied or not applied, and the problem is resolved. In this model, nothing is done after this fourth stage until a new fraudulent event takes place. Fraudulent events do not decrease; they might in fact become a chronic problem.

Like any other profession, people who want to become forensic accountants must attain the required qualifications. But before we get into the details of the qualifications that an individual requires to become a forensic accountant, let's have a look at the attributes that one needs to possess to become a good forensic accountant.

- Creativity- Thinking outside the box.
- Attention to details- To be able to see things in a detailed manner.
- Perseverance- Doing something despite difficulties and delay in achieving success.
- Organization- Being able to systemize things.

Educational Qualifications:

The educational qualifications that a forensic accountant needs to have are as follows:

- A bachelor's degree in commerce/accounting.

- A chartered accountant membership in a body of certified accountants.
- A specialization in forensic accounting
- Some of the places from where one can study and obtain certifications as a forensic accounting professional are as follows:
 - Institute of Chartered Accountants of India, New Delhi.
 - Association of certified fraud examiners (ACFE), USA.
 - Indian university, Bloomington, USA.
 - British Columbia Institute of Technology, Canada.
 - Charles Stuart University, New South Wales, Australia.
- Some of the courses available in India are as follows:
 - Post Graduate Diploma in Forensic Accounting
 - Certificate Course in Forensic Accounting Profession
 - Certified Anti-money laundering Expert
 - Certified Bank Forensic Accounting
 - Certified Vigilance and Investigation Expert

Conclusion:-Forensic accounting is a vital tool in all aspects of society. Regardless of your role in an organization it is likely at some point you will come in contact with forensic accounting. During an investigation forensic accountants spend time at the corporation working with employees and gathering information about the business structure as well as the financial records and accounts. Forensic accounting without any doubt, is a much-required area and a highly esteemed profession in today's day and age due to the substantial rise in financial crimes and fraudulent activities. Even though the field needs to be explored further in India, the increase in interrelated world scams has set in motion, in finance and accounting sector of the country.

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FUTURE PROSPECTS OF FORENSIC ACCOUNTING

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Abstract: The system of financial reporting and the accounting and auditing profession are often accused because of the appearance of frauds and loss of trust in the reliability of financial information on the part of the users and makers of economic decisions. Great financial frauds at the end of the past and beginning of this century have imposed the profession, the Enron scandal lead towards formation of a new regulative bodies and the appearance of a new profession is called Forensic Accounting. Investigation or simply Forensic Accounting (FA). It is the combination of the Accounting, Auditing and Investigation skills. Forensic Accounting ae related with deterring, detecting and investigating frauds in financial reporting. Initially, forensic accountants were used by government agencies, to uncover and investigate uncover fraudulent financial reporting and misappropriated assets. Forensic Accounting in India, of late has come to lime-light recently due to increase in white-collar crimes in business. This research paper discusses on the prospects and problems of forensic accounting, as profession in India on the basis secondary data collected from various sources.

Key Words: Financial Reporting, Auditing, Frauds, Forensic Accounting, Accounting, Fraudulent, White-Collar crimes.

Introduction

What is Forensic Accounting?

The use of accounting skills, to investigate the fraud and theft and to analyse the financial information for use in the legal proceedings. The word "Forensic" means the "evidence which is used to present in the court of law". It encloses both Litigation Support and Investigate Accounting. Forensic Accountants utilize auditing, accounting and investigate skills while conducting an investigation. It is the ability of forensic accountants to react immediately and to communicate financial information clearly and expressing in a courtroom setting. Forensic Accountants are well trained to deal with the problem and look into day to day business reality.

Objectives of the study

It highlights the problems and prospects of Forensic accounting in India in the context of growing various frauds.

To understand the basic techniques used by forensic accountants.

To determine the differences between forensic accounting and financial audit.

History: Maurice E. Peloubet was the man who came up with the word 'forensic accounting' in 1946. Previously, the use of forensic accounting was not recognized as a separate practice area distinct from auditing. Over the decades, the auditing function separated itself from fraud detection. As forensic practices followed their own separate path, the services provided changed into those of an investigation nature. Today, with the rash of cybercrimes being committed against every business connected to the internet, the nature of forensic practice is poised to expand into new territory. This article tells us the history of forensic accounting, and makes predictions about what the future holds for this practice area.

(In the fall of 2000) Enron's case- the corporate company would build a plant, and instantly claim the projected profits on its books although , it hadn't made any real money from it. If the revenue from plant were less than the projected amount, rather than taking the loss, the company would then transfer these assets to an off-the-books corporation like chewco *(which was fake) , where the loss would go unreported.

But in Indian history of forensic accounting which goes back to Mauryan Times where Kautilya was the first person to publicize the famous 40 ways of fraudulent practices in his renowned Arthashastra. Although India' chartered Accountants are well known to take up investigative assignments and only a few companies have the department of finance which detects fraud. However, the enormous space is dominated by the four big companies like Deloitte, KPMG, price water House Coopersand Ernst and Young. Are in search to the requirement of forensic accountants.

Techniques: The Direct technique is also known as transaction technique where the management and staff will be interrogated by the accountants. The Cash T Method, The Source and Application of Funds Method, The Net worth Method and The Bank Deposit Method come under Indirect technique. The Cash T technique - It is typically utilized once a company's books and records don't clearly show their financial gains resulting in a suspicion that they would have omitted an amount of their earnings for a selected period of time.

The Source and Application of Funds Method - The Source and Application technique measures standard of living (lifestyle) against cash spent on assets and investments to ascertain if any noticeable discrepancies exist. It is the side of measurement incoming expenditures that make these two strategies usually comparable.

The Net Worth Method – In this method, the net value of a person is evaluated from the start to the end for an estimated period of time. The resultant number represents net worth which is compared to reported incomes over many periods. Any variations in the amount, a forensic accountant may pursue the investigation.

Bank Deposit Method - Bank deposits are tallied against entire expenses during a given year. This number is compared to funds from known sources to determine the total funds from unknown sources. The Forensic Accountant will investigate those unknown sources further by interrogating individuals who are responsible to trace information, about those particular amounts.

Procedure for forensic investigation:

1. **ACCEPTING THE INVESTIGATION:** Forensic Investigators should be expert in their work and have detailed knowledge of the techniques of investigation. The specialization of investigators include training in interrogation techniques, to maintain the safety of evidence other considerations include it or not the process is being requested by an audit client if there may be a chance of them being ethically questioned as the firm would be potentially exposed to threats the firm should avoid providing services to the same client without any robust safeguards.

2. **PLANNING THE INVESTIGATION:** The investigator's should aim to achieve what they have been asked to do and plan accordingly. Primarily should be:

To know for how long this fraud has been operating for,

The nature of fraud that has been carried out and

3. **GATHERING EVIDENCE:** The gathered evidence should be able to identify the fraudster's mechanism of their scheme, and the financial loss incurred. The team should be professional and trained in collecting evidence that needs to be presented in court. The evidence so provided needs to be linked without any gaps in the chain if not the evidence can also become inadmissible. False documents should not be provided.

4. **REPORTING:** A report on what has been found, the summary of what went wrong, the techniques used by the fraudsters etc should be presented to the client. This is to keep them informed and be protected against any such fraudulent practices.

DIFFERENCES BETWEEN FORENSIC ACCOUNTING AND FINANCIAL AUDIT

FORENSIC ACCOUNTING	AUDIT
1.It focuses on-Fraudulent accounting/reporting.	1.Performs in accordance with usually accepted auditing standards (GAAS).
2. It seeks to verify and check the existence of specific issues or allegations ,extent and cause.	2.Provides opinion on monetary statements for general or restricted use.
3. It usually has few preset boundaries and greater access to executive management.	3.Conducts procedures in accordance with associate accepted methodology and procedures with materiality levels.
4. The analyst uses methods which include completeness and integrity.	4.An audit's objective is to provide assurance, to the intended user, that the information contained in those financial statements is a fair and accurate representation of the organization.
5. A forensic accounting engagement is designed to analyze a specific set of transactions or to search for misappropriated assets.	

- Advantages:**
- a. Review: The information is useful for legal reviews or public debates with the aim of resolving disputes.
 - b. Valuable Contributions to an Economy: the information is analyzed and is helpful in formulating policies in an economy.
 - c. Detection of Fraud: forensic accounting ensures that accounting policies and systems are followed to the book -- where any activity which is different from the normal is detected.
 - d. Career Opportunity: it not only involves basic accounting activities, but also involves discovery of evidences presentable at the court of law.

Disadvantages:

- a. **Costly** : Forensic accounting utilizes the new software techniques and skills, which proves to be very expensive.
- b. **Risk:** Forensic accounting involves detection of fraudulent activities and presentable at the court of law. The forensic accountants might be black mailed, extorted or terrorized due to their involvement.
- c. **Confidentiality:** Forensic accountants are appointed from outside the business to analysis' its monetary transactions, therefore it should be confidential.

d **Losing worker' Trust** : It is quite obvious for workers to be offended when their work is being scrutinized by a 3rd party. Lack of trust can also lead to inefficiency at work.

Methodology

The Survey has been conducted and analysed in three ways .i.e., from the point view of Chartered Accountant, Students, Professors and others. The analysis was done on the form of a questionnaire which contained questions associated with the- Support of people for the move, their views, benefits and difficulty faced by them by Forensic Accounting and the assistance provided by Forensic Accountants. The analysis was done with a sample size of 23 numbers of respondents.

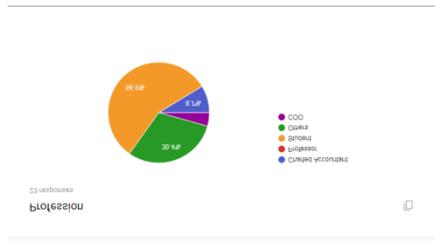


FIGURE:1 Source: Own Computation Primary Data

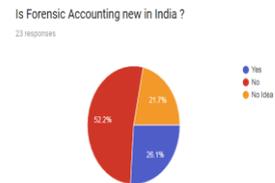


FIGURE: 2 Source: Own Computation Primary Data.

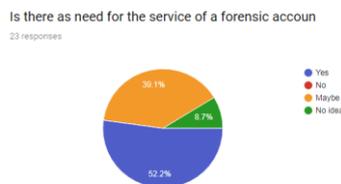


FIGURE: 3

Source: Own Computation Primary Data.

Are you aware of what is forensic Accounting is ?

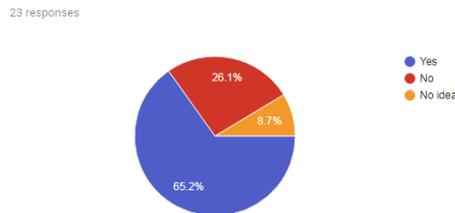
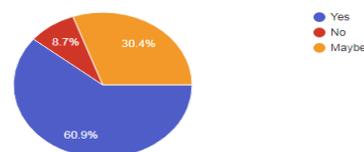


FIGURE: 4

Source: Own Computation Primary Data.

FIGURE: 5

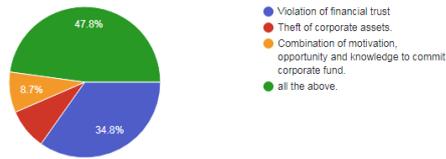
Should the topic Forensic accounting be implemented in students day to day curriculum ?



Source: Own Computation Primary Data.

FIGURE: 6

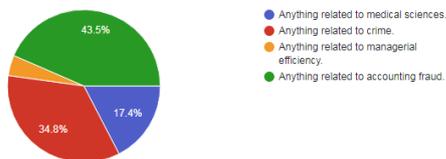
According to your point of view what is white-collar crime ?
23 responses



Source: Own Computation Primary Data.

FIGURE: 7

What do you understand by the term "Forensic"?
23 responses



Source: Own Computation Primary Data.

FIGURE: 8

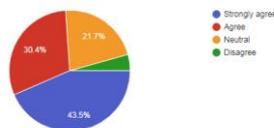
Can forensic accounting be used to detect and prevent the white-collar crimes ?
23 responses



Source: Own Computation Primary Data

FIGURE: 9

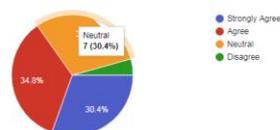
Will the forensic accountants examine financial records and transactions closely to identify and stop frauds?
23 responses



Source: Own Computation Primary Data

FIGURE: 10

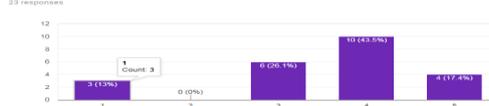
The forensic accountant in India is up to a hard job because of the high rate of dis-honesty in the country?
23 responses



Source: Own Computation Primary Data

FIGURE: 11

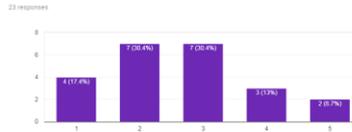
How would you rate a company/business in which a forensic accountant is part of the organization?



Source: Own Computation Primary Data

FIGURE: 12

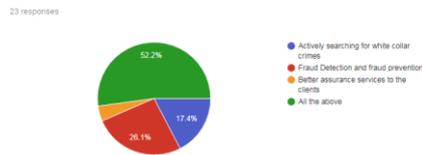
How would you rate a company/business in which a forensic accountant is NOT part of the organization?



Source: Own Computation Primary Data

FIGURE: 13

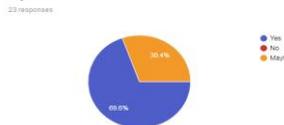
What is the aim of Forensic Accounting ?



Source: Own Computation Primary Data

FIGURE: 14

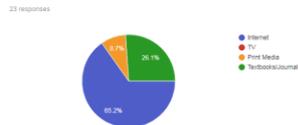
Do you believe employing a forensic accountant would make some positive impact on the detection and prevention of fraud in your organization?



Source: Own Computation Primary Data

FIGURE: 15

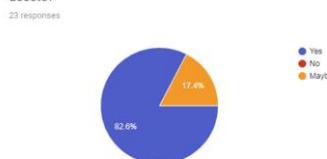
How did you hear about forensic accounting?



Source: Own Computation Primary Data

FIGURE: 16

Knowledge of forensic accountant and auditors in your organization will make some impact on the nations fight against fraud and theft of assets?



Source: Own Computation Primary Data.

Conclusion: As the government is trying to get awareness about forensic accounting in the colleges and in the companies too. As it is not in a regular use but should make a mandatory subject so that people will know the importance of forensic accounting, about the forensic accountants, thefts and frauds which are taking place in the companies. So that the measures are taking from starting to prevent theft, misappropriation of assets, and fraud.

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FOREX-THE CLOSED BOOK

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Abstract: This paper attempts to Explain Forex in detail including PIP (Percentage-In-Point) and understand the need of Forex in current world and how it will become a new way to market in the coming days. It also discusses the various transactional aspects that need to be looked into and challenges faced by Forex in current world. This paper also talks about the purpose of Bull and Bear Market. The analysis of data is done using an Online Questionnaire which shows the importance of Forex in a Students life . The implementation process may go through a teething phase and therefore a few strategies have been suggested.

Key Words: PIP, Bull Market, Bear Market, Student life.

FOREX-The Closed Book: The forex market is the most exciting, fast market around. Until now, forex trading in the currency market was the region of large financial institutes, corporations, hedge funds, central banks and wealthy people. The emergence of the web has changed this, and now it is possible for investors to purchase as well as sell currencies with great easy by a click of the mouse through online brokerage accounts.

Currency fluctuations on a daily basis are quite small. Many currency pairs move less than 1% per day, showing less than 1% variation in the value of the currency. This results in foreign exchange being one of the least volatile financial markets. Thus, a lot of currency speculators depend on availability of huge leverage to surge the value of probable movements. The retail forex market shows leverage can be as high as 250:1. Greater leverage can be risky, but due to 24x7 deep liquidity and trading, forex brokers are able to make big leverage an industry standard in order to make the movements meaningful for currency traders. Availability of high leverage and liquidity have facilitated to spur the forex market's growth and has made it a suited place for traders. Positions can be opened/closed within minutes or can be held for months. Currency prices are based on objectives of supply and demand and it's hard to manipulate them because the size of the market does not allow even the top players like central banks, to change the prices at their wish.

The forex market gives abundant supply of opportunity for investors. However, to be successful, a currency trader must understand the basics underlying currency movements.

Objectives of the Study

To Analyse the situation of Forex in current world.

To Determine what Bull and bear markets are

To Know the need for Forex in Student life.

Forex- The old Story: The creation of the gold standard monetary system in 1875 was extremely significant in the history of the Forex currency market. Countries attached an amount of their currency to be equal to an ounce of gold; the changing price of gold between two currencies became the first standardized means of currency exchange. The gold standard broke down in World War I because the major European powers didn't have enough gold to exchange for all the currency that the governments were printing at the time to complete large military projects. The gold standard began anew between the wars, but was dropped again by the start of WWII. Gold never lost its position as the ultimate form of monetary value. 1944 saw the Bretton Woods System which led to the formation of fixed exchange rates resulting in the U.S. dollar replacing the gold standard as the reserve currency. Thus, the U.S. dollar became the only currency that would be backed by gold. 1971 was end to this system marked the end of this when U.S. declared that it would no longer exchange gold. Dollars that were held in foreign reserves. This led to the almost global acceptance of floating foreign exchange rates in 1976 effectively producing the current foreign currency exchange. It became electronically traded only in the mid-1990s.

Forex- Current Standing: The world's biggest market is Shrinking or Growing?

The forex markets are the world's biggest was built over years of fast globalization, growth and deregulation in financial services and is highly unlikely to be relinquished any time in the future. But the glorious days are done. The Employment and market volume levels have shirked at the biggest trading currency because of strict bank regulation, the emerging market boom and results in slow speed in world growth and business take their effects. Industry numbers indicate the count of traders engaged in Europe at the best 10 foreign exchange banks has reduced by 30% over the last 3 years. Numbers from Bank of England and also New York Federal Reserve in recent months showed that business volume has dropped to its lowest level in three years. Coalition state a

financial industry analytics data firm, among the top 10 of FX banks working in Europe employs with 332 persons on their G10 European Forex trading desks the previous year. When it was 475 in 2012 means 30 percent less. According to information provided by CLS Bank, showed the average daily volume in the month of January was \$4.8 trillion, down by 9 percent from the year earlier and a far cry from the \$6 trillion peak. Central bank in US and Britain highlighted the trend in a recent survey that showed daily volumes were down 21% in April to October 2015 from a year earlier in London and 26% in New York

Bull and Bear Market: Every day in the investment world, you hear the words "bull" and "bear" to define the market. As commonly used these terms are, the understanding of what their meaning is not easy. This is because the direction of the market is a major deciding force affecting the portfolio, it is very important you know accurately what these terms, ie bull and bear market, actually represent and how either affects a person.

Are Bear and Bull Markets What They Sound?

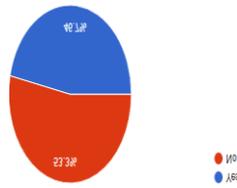
These terms are used to define how stock markets do in general - ie, whether the value is appreciating or depreciating- these 2 terms are continuously buzzing in the investing world. Simultaneously, the market is determined by the investors' behaviours, these words also denote what investors think about the markets and the trend. In simpler words, a bull market refers to any market that is on a rise. It is classified by a sustained hike in market share prices. In times such as these, investors rely on the fact that the trend will continue upwards in the long term. Typically, the economy of the country is strong and employment levels are high. On the contrast, bear markets are those that are in decline. Share prices are constantly dropping, resulting in a downwards trend that investors trust will continue in the long run, which, in turn, perpetuates the spiral. In the course of a bear market, the economy typically slows down and unemployment rises as companies begin laying off workers.

Where Did the Terms Come From?

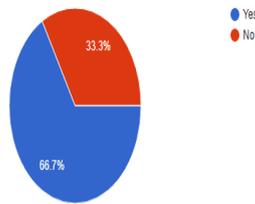
The origin of the word "bull" as well as "bear" are not definite, but here are 2 of the very common explanations: The bear and bull markets have been given their respective nomenclature after the method in which these animals attack its victims. It is a characteristic feature of a bull to drive its horns up into the air, while a bear, on the other hand, like the market that holds its name, swipes his paws downwards upon the unfortunate prey. Furthermore, bears and bulls were once extremely fierce rivals when it was popular to put bulls and bears into the arena for a match. Battle between bulls and bears are a thing from the Golden era in London and which have also become a spectator sports in Ancient Rome. There is no particular way to judge market trends, So investors should invest based on quality investments and quality approach.. At the same time. However, you should have a detail understanding of long term market because both market can have a huge impact on our investments. Take time to analyse what market is doing before making investments. Even in the long terms market post a positive point.

ABOUT THE METHODOLOGY

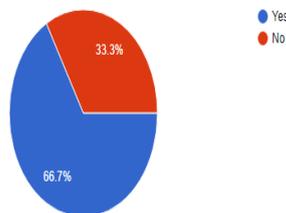
The survey aims at understanding how Forex is important in Students life. The questionnaire was prepared online which contained multiple choice questions. Mainly analysing the situation/awareness of Forex in student life and if it is required as a Subject in their course and also underlines other important aspects of Forex. The questionnaire was given to people of 18 to 20 years of age and all the respondents were students as the main motive of the questionnaire was to understand the awareness and need of Forex in students life. First question asked was the awareness of Forex in student's life where 53.3% of the students were aware about Forex where 40% students didn't know what Forex was/have never heard of it where 6.7% of students were not sure about the answer. The second question directly pointed out what according to the students Forex Deals in where 66.7% of the students said Forex Deals in money. Where 6.7% of students said Forex does its dealing in Binary Operations and 26.7% students answered the questions saying other operation than money and Binary Operations. Later the students were asked if whether their curriculum teaches them about Forex where 70% Students said no and 30% students said Yes. The next was whether students have exposure to Forex where 53.3% of students disagreed and said that they doesn't have any exposure to careers in Forex market where 46.7% students agreed.



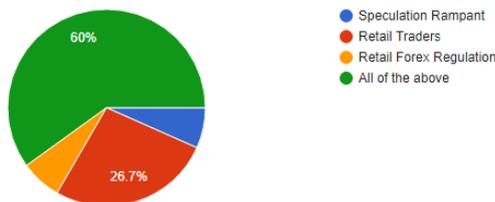
The students were asked whether the faculty encourage them to update knowledge about Forex where the Faculties passed as 66.7% of students said that the faculty to encourage them to update knowledge about Forex where 33.3% of students said their faculty doesn't encourage them to do so and this creates a big problem as all the faculty members in all the colleges should encourage students to update their knowledge about Forex.



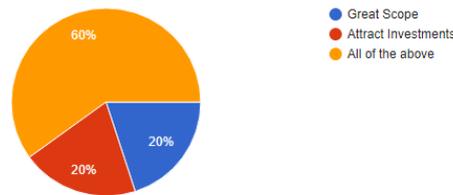
Human psychology says people do things which make them famous or things which are already famous or have flourished in the world. Students were asked if they think Forex is a thriving topic these days where 66.7% students agreed where 33.3% students disagreed.



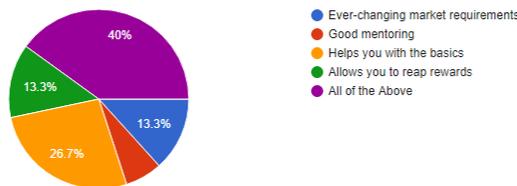
Students were asked how is Forex important according to them where 13.4% of students said it helps in Speculation Rampant and Retails Forex Regulation and 26.7% of students said it is important for Retail Traders and its helps in easy understanding of Retail trading where 60% of students said it is important for all the options above like Forex is important for Speculation Rampant, Retail Forex Regulations and Retail Traders.



As students are the ones who'll be learning the new subject Forex in future, students were asked why they think learning Forex is necessary where 20% students said it has great scope in future, other 20% students said it will help attract investments and where 60% of the students agreed for both the causes.



Students were asked why they should get a Forex Education where 26.7% of students said it'll help them with the basics of the world market where next 13.3% said it'll help in analysing Ever-Changing market requirements and other 13.3% students said it allows to reap rewards and 6.7% of students says it helps in good mentoring. Where the Majority of 40% of Students said that Forex Education should be attained as it'll help to achieve all the major Factors mentioned above.



An important question of whether respondents knew any institute training in forex was asked, 60% of students said they know few institutes and on the other hand 40% of the students had no idea about such institutes. Rather than going to institutes there is one more way to learn the subject, it's called the Virtual World which means online mode. But knowledge attained online does not provide practical knowledge. 60% of the students would like the learn About Forex Offline and the rest 40% students chose to learn offline.

Conclusion: Although foreign exchange may be confusing, there is a critical need for almost everyone to understand foreign exchange. As the world shrinks, there is an ever-increasing likelihood that we will be required to address the risks associated with the fact that there are different currencies used all around the world and that these will have an immediate impact on *our* world. We must be able to evaluate the effects of, and actively respond to, changes in exchange rates with respect to our consumption decisions, investment portfolios, business plans, government policies, and other life choices. Moreover, there is an ever-increasing probability that we will have to transact in these foreign exchange markets—in our personal or professional life.

The words that were written by Claude Tygier are as true today as they were back then:

To most people, the arena where the world's major currencies fluctuate against each other remains very much of a mystery.¹

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IFRS AND IND AS A GLOBAL OPPORTUNITY

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Abstract: IFRS(International Financial Reporting Standards) are a set of accounting standards developed by IASB(International Accounting Standards Board) that are global standards for preparation of financial statements of a company. Indian Accounting Standards (Ind-AS) are the accounting standards which are converged with IFRS. Since India is getting globalised and many foreign direct investments are been made in India and the growth rate is improving there is a need for changing the accounting procedures which are being followed in India. As IFRS has gained worldwide acceptance amongst many countries and also employed uniform, single consistent accounting framework, India has decided to get converged with IFRS instead of whole adoption. This convergence has paved the way for many global opportunities in various sectors of economy, banking, finance, etc.

Key Words: IFRS ,IND AS, Global standards ,Opportunity, Convergence.

Introduction

In 1991, India has gone for Liberalisation Privatisation Globalisation of our economy. Various barriers have been removed and various international standards have come into play. Industries also started competing with the global markets. This is a period during which accounting globalisation has happened.

The current scenario of globalization and liberalisation has become the geological barriers of commerce. Many of the companies are getting listed on major stock exchanges of world. On the other hand, there is wide spread of capital market leading to free passage of foreign direct investments in various countries.The foreign direct investment is attracting and ultimately leading for the evolution of investors in various countries. Therefore the uniform financial reporting system held with rigid corporate governance strengthens and enhances the economy in any country. The uniform standards and accounting policies when followed provides for the better and easy communication and also easy understanding of financial statements. As the standards are unique in each country it has raised the dire need of conformation of accounting policies, accounting standards and disclosure requirements.

In this context an independent, global standard-setting body International Accounting Standard Board (ASB) gave a set of globally accepted accounting standards called IFRS. The principles of IASB are

- a. to develop a single set of high quality, understandable, enforceable and globally accepted IFRS.
- b. to promote the use and rigorous applications of those standards
- c. to take account of financial reporting needs of emerging economies and small and medium size entities.
- d. to bring about convergence of national accounting standards and IFRS to high quality solutions.

Objectives

1. Providing a clear vision on IFRS and IND AS.
2. Brief explanation of IND AS.
3. Reasons for adopting IFRS and methods of adoption.
4. Opportunities of IND AS.

Meaning of IFRS

The term IFRS has both an arrow and a broader meaning. IFRS refers to the new number series of pronouncements that the IASB is issuing, which is different from International Accounting Standards (IAS). It includes standards and interpretations approved by IASB and IAS and SIC interpretations approved by International Accounting Standards Committee.

ACCOUNTING STANDARDS IN INDIA

Accounting Standards in India are issued by Accounting Standard Board (ASB) of Institute of

Chartered Accountants of India (ICAI) based on IFRS with the opening of Indian economy in near past, the convergence of IFRS has become unavoidable. Keeping this in view, ASB decided to form an IFRS task force in August 2006. Based on recommendation of task force, the council of ICAI, in its 269th meeting decided to fully converge with IFRS from the accounting periods commencing on or after 1st April 2011. At initial stage, this convergence will be mandatory for listed and other public interest entities like banks, insurance companies, NBFC's and large sized organisations with high turnover or annual income.

The Ministry of Corporate Affairs in its press release dated 25.2.2011 notified 35 Indian Accounting Standards converged with IFRS (hence forth called IND AS). The Ministry of Corporate Affairs will implement the IFRS converged Indian Accounting Standards in a phased manner. After various issues including tax related issues are resolved with the concerned departments.

ADOPTING IFRS

The adopting method is classified into two types

Voluntary adoption

It was stated that under this method companies can wilfully adopt IND AS from beginning of accounting period 1st April 2015. So the companies once adopted under this method cannot step back.

Mandatory Adoption

There are two phases adopted in this method

PHASE I:The following companies should adopt IND AS on or after 1st April 2016 with comparative for period ending 31st March 2016 or here after

1. Companies whose equity or securities are listed or still in the process of being listed in any stock exchange of India and whose net worth is 500 crores or above.
2. Companies other than those which are mentioned above with net worth of 500 crores INR
3. Holding, subsidiary, joint venture or associate companies of the companies whose net worth is 500 crore INR or above.

PHASE II:Phase II includes compulsory adoption of IND AS from the period beginning 1st April 2017 or there after which are listed below

1. Companies whose equity or securities are listed or still in the process of being listed in any stock exchange of India and whose net worth is less than 500 crores INR.
2. Companies which are not listed and are not covered under phase I and phase II whose net worth is more than 250 crore INR but less than 500 crore INR.

Opportunities of IND AS :It is widely known that over and above 160 countries have adopted IFRS and enjoying the fruits of adoption. The US Securities and Exchange Commission (SEC) had recently made a decision allowing the cross-border companies who had listed in US to present their financial statements in accordance with IFRS implying that those companies need not prepare different financial statements as per US GAAP .So, India being converged to IFRS would provide a greater advantage avoiding the separate preparation of financial statements according to US GAAP. Also in India there being rigid economic conditions and reduction in capital market growth turned Indian companies to a challenge. Therefore converging to IFRS would provide the following opportunities.

Beneficial to MNCs : As there are many MNCs situated in India convergence to IFRS would greatly advantage them also India has many holding companies subsidiaries and associates in various countries. So pliability to IFRS would authorize the management of MNCs in India and also the holding companies of India across the border to prepare financial statements in a single stand by facilitating the consolidating process .

Professional Opportunities: The accounting professionals like chartered accountants students possessing accounting knowledge in India could attain a bright future by accessing to knowledge of IFRS .This convergence process would create greater professional opportunities in India and across the globe.

Development of service sector:IFRS being globally accepted accounting standards would greatly demand for a professionally trained accountants, auditors etc.This would add on the benefit to service sector in India as it would enhance the quality of service providers of accounting.

Ease of access to capital markets: India being a developing country is in an urge of foreign capital investment by expanding its capital market in countries across the world. As most of the countries accept the IFRS standards, convergence to these standards would make India accessing capital markets across the country easily.

Transparency in financial reporting:IFRS standards assure true and fair view of financial statements to the users. They are of high quality and so are globally accepted. Compliance to these standards entails transparency of financial information to the users accessing to it.

Comparison: It makes the cross-border investors to easily compare the financial statements of one country with the other as different countries follow different accounting standards with different accounting policies. IFRS acts as a tool of better comparison the standards of various countries.

Reduces the Cost: Many companies with its branches in various countries will have to prepare financial statements according to standards of that country which would increase the cost of preparing these financial reports. Hence adoption to IFRS would make the work easy by preparing single set of financial statements to various countries and thereby reducing the costs.

Conclusion

It is concluded that though adoption procedure may consume time and many challenging the companies in many ways, yet there are wider scope of opportunities in India and also Professional accountants suggested that adoption of IFRS would expand the capital market of India in various countries and develop the growth of economy of the country. Considering the convergence as a boon to the county, India can further contentedly proceed with the convergence opening the wide windows for development of economy.

Sources of data: Secondary source of data is being used from various references.

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IMPACT OF FOREIGN DIRECT INVESTMENT IN AVIATION SECTOR

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Abstract: Foreign direct investment is the investment in business by an investor from another country for which the foreign investor holds 10% or more of a foreign company's capital. FDIs have been made in various sectors in India as a result we have seen particular growth in Indian economy. As per the economical status India has currently considered as one of the 9th largest domestic civil aviation market around the world. Impact of FDI in aviation sector is one of the current topics being discussed by the Indian government. The policy of the government of India towards the foreign direct investment has been positive due to the shortage of domestic capital. However, foreign investor did not show keen interest investing in India until 1991 due to type of economic system of our country. The economic liberalizations of 1991 have given greater fillip to the foreign direct investment. As per aviation policy 2016 government allows 100% investment in airlines and 49% is for FDIs. There are many factors influencing FDI in aviation sector also many benefits, the study also reads the role in FDI in the development of Indian airline services and the consequences of the impact.

Key Words: Aviation, FDI...

Aviation Sector in India: The aviation industry in India is one of the fastest growing industries in the country during the last three years. India is the 9th largest civil aviation market in the world and presently has a market size of US \$16 billion. India will displace as 3rd place by 2026 and replace the UK. The civil aviation industry has been entered in to a new era of expansion, driven by factors such as low cost carriers, FDI in domestic airlines and IT interventions and growing emphasis on regional connectivity. The Indian aviation sector is among the five fastest growing aviation markets globally, growing at over 20% year over year. The aviation sector today supports 56.6 million jobs and produces over US\$ 2.2 trillion of the global GDP. The Government plans to invest US\$ 12.1 billion in the airport sector during the 12th five year plan period towards construction of new, low cost airports and development of existing ones.

The Impact and Consequences of FDI in Aviation Sector: FDI is being very beneficial to home country as well as the host country as it helps in increasing the exports of machinery, equipments, technology etc., from the home country to the host country. This in turn enhances the industrial activity of the country. To increase industrial activities in the home country and enhance employment opportunities. The firm and other home country firms can learn skills from its exposure to the host country and transfer those skills of the industry in the home country. The cost to the home country is the industry and employment position are at stake when the firms enter foreign markets due to low cost labor. The US textiles moved to Central America. This resulted in retrenchment in the USA. Current account position of the country suffers as FDI is a substitute for direct exports. The benefits to host country are that the resources which are in scarce in host country are transferred from the foreign. Transfer of these resources develops the host country and helps in the development of ancillary industries. the cost to the host countries are it will have a negative effect on the balance of payments and there will be national sovereignty and autonomy.

There are several impact lied on the aviation sector due to FDIs. Raising the FDI limits for airlines to 100% will boost up the civil aviation sector, as they are suffering from shortage of capital.

Domestic investors who are looking to raise the capital or forge an alliance with foreign airlines will benefit from new policy the 100% opening of FDI will help to bring in much needed capital to domestic investors. The FDI relaxation will make existing operating airlines a good vehicle for many companies that are favorably inclined towards India and will be looking increase their exposure in the country. New norms and policies will attract more and more investors into aviation sector and it will help in increasing the competition. If there is an increase in competition it will bring down the air prices and enhance air penetration in both domestic and in international route.

FDI will only going to improve the standard quality of Indian airports and services. FDI has been already benefitted to various carriers like jet airways, air Asia India and Vistara.

India suffers from many economical issues due to high taxation structure, ground handling is also dominated by foreign companies majorly and it is a major avenue for FDI.

FDI in aviation sector has been resulted in improvement of airline services and standards as these airports have a way served to enhance passenger experience.

Hypothesis: -The decision made by Government to allow FDI in aviation sector for the interest of economy was a correct decision.

THE Govt has allowed the privatization of the airport development sector in both Greenfield and Brownfield. This resulted in the establishment of the new airports in Hyderabad and Bangalore and the redevelopment of airports in New Delhi and Mumbai. This also resulted in infrastructure development, job creation skill development and economical development.

The Government of India focusing on developing the world class infrastructure to meet the growing demand of the country. Airports are being developed in public private partnership mode with government actively involving private sector

participation. 160 airports in India are being revived and operationalized in an attempt to increase regional and remote air connectivity.

International civil aviation organization states that every 100 jobs created in the aviation sector, an additional 610 new jobs are created in the local economy. To meet the growing demand and need for capacity addition, estimated to the 3.3 lakh by year 2025.

FDI inflows has witnessed a tremendous growth of 605% (7 times) growing from US\$ 61.8 million during the year from April 2012 to Mar 2014 to US\$ 435.81 million.

The FDI relaxation will make the existing operating airlines a good vehicle for many overseas companies that will be favorably inclined towards India.

Latest reforms in FDI in aviation sector will bring useful capital to a beleaguered sector.

FDI investment is required to keep Indian airline working, Indian aviation is one form that was totally made in India and should involve FDI to have its name globally.

The union cabinet unwhealed a fresh round of liberalization of the FDI policy, allowing foreign airlines to invest up to 49% in Air India and opening up to 100%. A foreign Airline can acquire 49% stake in the national carrier, listed for disinvestment. If a Government besides to exit Air India, Indian partner can hold 51%. Under the existing rule foreign Airline can invest with Government approval, in Indian company scheduled and non scheduled air transport service up to 49% of their paid up capital.

Reforms may result in increase in FDI inflow: In Air India including foreign airlines shall not exceed 49% either directly or indirectly, the Govt said. There are possibilities of bringing Singapore Airlines onboard to buy the stake by Tata Sons and tying up of Indigo with Qatar Airlines. The move paves the way for fast tracking the disinvestment in the state run airlines and will enable foreign airlines to bid for the loss making career. During 2014-15 total FDI in flow were \$45.15 billion as against \$36.05 billion in 2013-14. In 2015-16 the country received \$55.46 billion while in 2016-17, it attracted \$60.08 billion, which is an all time high. FDI could spur investments and generate large scale employment and lead to larger FDI in flow.

The TATA Singapore Airlines JV Vistara and Jet Airways, in which Abu Dhabi based Etihad has 24% stake, can now bid for the Airline after this amendment. Indigo, which has given a formal expression of interest for the airline arm of the Maharaja, can now tie up with foreign airlines to get the long haul expertise and finance required, to bid for Air India.(according to The times of India.)

Data collection and Result Analysis:The following is the result analyzed after the round of questionnaire taken by 45 people. This questionnaire includes 10 questions asked to peoples those who are employed in different working institutions.

1. Are you aware about FDI which is the source of newspaper do you refer.

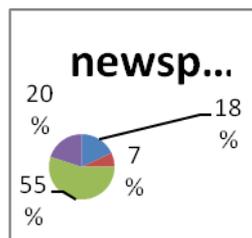


Figure 1: from the collected data we concluded that people are aware about FDI and the mostly preferred newspaper is THE HINDU and the least preferred is the economic times.

2. Do you think FDI is beneficial for Indian public?

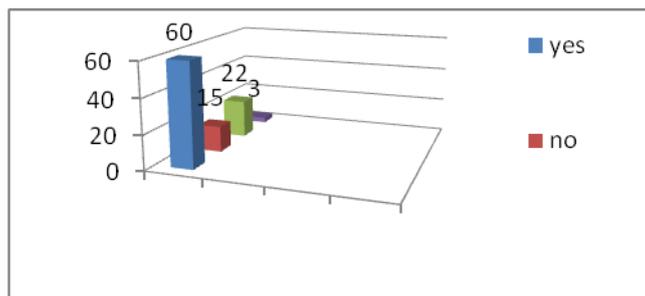


Figure 2: we concluded that most of the public has the opinion that FDI is beneficial for public and 22% of people say that is not beneficial for all.

4. Does FDI has a role in the development of aviation sector in India?

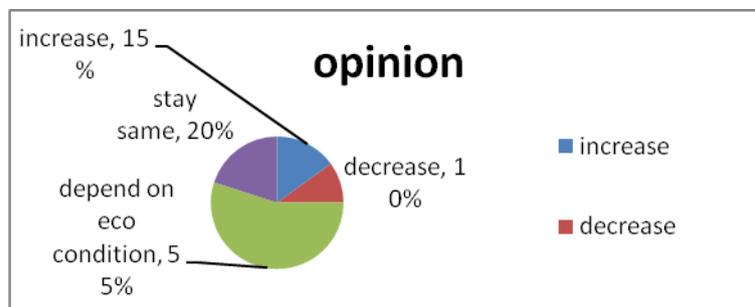
The results were that 75% answers were yes and the least concluded answers (5%) was that it has less than 50% in the development of aviation sector in India and 20% said it has more than 50% in the development of aviation sector.

5. Does FDI effect domestic inflation?

Yes	15%
No	70%
Sometimes	10%
None of these	5%

The Result concluded that 70% of the public as the view that FDI does not affect domestic inflation and 15 % says ‘Yes’ effects domestic inflation.

6. As FDI in aviation sector is 49% for foreign countries this should be increased decreased in coming years.



7. Government should disallow FDI in aviation sector?

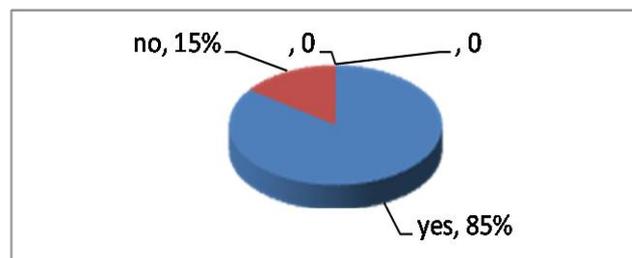


Figure 3: the majority of the population says that FDI in aviation sector should be allowed.

8. Does FDI will increase privatization in India business?

Yes	65%
No	13%
May be	20%
None of this	2%

The result was majority says that it will increase the privatization of in India if FDI is there and minority says that may be it will increase.

9. What % according to you does FDI has contributed in the aviation sector of India?

The resulted concluded that 50% of the public says that it has contributed 10% in GDP and the minority of public says that it contribute 30% to the GDP.

10. Is FDI curse or blessing to the aviation sector?

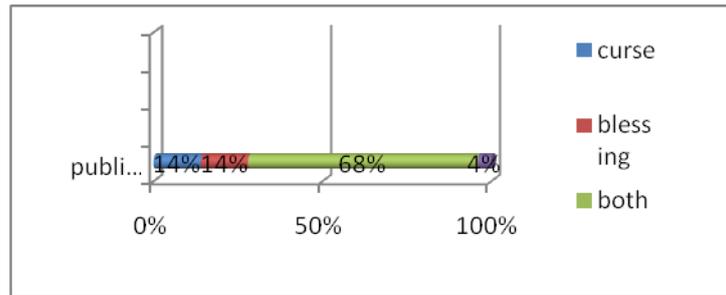


Figure 4: the result is that the public view believe that FDI is both curse and blessing to the aviation sector and the least of the views says that it is none of this.

Conclusion: FDI in India one of the growing trend in India going on past few years the analytic result concludes that FDI is beneficial for the Indian public and has more that 50% role in the development of airline services if India and it is both curse and blessing for the country as it generate employment and develop economical status but it also includes many difficulties to work properly and the utilization of foreign money should be done properly.

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THE MENANCE OF GROWING NON-PERFORMING ASSETS

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Abstract: Banks are playing a vital role in the Indian economy. The main function of the banks is to mobilize deposits from public and lend to the needy. Thus, the banks are trusted and they are trustees of public money. The apathy of Big Businessmen is leading banks into losses. Bad loans are said to be the Non-performing assets, when the Principal and interest amount are overdue for more than 90 days. The failure of the borrower to honor his commitments on due date is due to number of reasons, beyond his control in some cases. However, lackadaisical conduct of the banks either under pressure from influential sections of society or mollified motive or greed of earning usurious interest do contribute significantly for the generation and growth of Non-performing assets. The present article seeks to highlight the effects of the Non-performing assets on banks and its deploring effect on society and the customers in general.

Key Words: banks, non-performing assets...

INTRODUCTION: Banks are the nervous system of the Indian economy. Banks main source of income is the difference between the interest they earn on loans given by them and interest they pay on deposits. Assets for any bank are loans it has lent and investments made by the bank. Bad debts or nonperforming assets indicates the financial condition of the banks. In general, non-performing asset means the amount of loan that was not returned by the borrower. An asset becomes a nonperforming asset when it ceases to generate income.

According, to an analysis present NPA rate of Indian economy is 9.9%, India has been ranked 5th on the list of countries with highest non-performing assets.

YEAR	NPA Rupees (crores)	NPA RATIO
March-2016	5,71,841	7.69
June-2016	6,18,109	8.42
September-2016	6,51,792	8.81
December-2016	6,77,443	9.18
March-2017	7,11,312	9.06
June-2017	8,29,338	10.21

As per RBI analysis following are the non-performing assets ratio in India.

LOAN: An amount borrowed, and is expected to come back with interest. There are different types of loans like,

HOME LOAN: Bank provides a loan to the people who wish to buy their own house. This is a secured and low risk loan.

PERSONAL LOAN: The Personal loan is given to buy consumer durables and to meet personal expenses.

VEHICLE LOAN: These loans are given to acquire a car or bike. A Lender will have the lien of the vehicle till the last installment is paid.

Business loan: These loans are generally granted to the existing businessmen, (a). to expand their business, (b) to meet working capital requirement. Getting loans for startups is somewhat difficult.

GOLD LOANS: This is the safest loan among all the loans. The Lender has the right to sell the pledged gold in an auction in case of default by the borrower.

AGRICULTURE/CROP LOANS: Agriculture loan enables farmers to get finance for various agriculture operations. The Rate of interest on these land is slightly low, compare to other loans in the market.

EDUCATION LOAN: These loans are provided with an intention of providing education to every individual. Usually, interest on this loan is very low and are to be repaid after completing education and getting employment.

According to RBI "An asset, including a leased asset, becomes non-performing when it ceases to generate income for the bank. A 'non-performing asset' (NPA) was defined as a credit facility in respect of which the interest and/ or installment of principal has remained 'past due' for a specified period of time. The specified period was reduced in a phased manner as under:

YEAR	TIME PERIOD
1993	FOUR QUARTERS

1994	THREE QUARTERS
1995	TWO QUARTERS
From 2004	90 days

Assets of the banks are classified into different types, they are

STANDARD ASSET: The Standard asset is one which does not carry any problem except normal business risk.

SUB STANDARD ASSET: A substandard asset can be defined as an asset which remained a non-performing asset for less than or equal to 12 months.

DOUBTFUL ASSET: An asset is to be considered as a Doubtful asset if it remains a substandard asset for more than 12 months.

LOSS ASSET: When an asset remains a Nonperforming asset for more than 36 months then it is said to be a loss asset.

TYPES OF NON-PERFORMING ASSETS:

GROSS NPA: Gross non-performing assets consists of all assets i.e., Substandard assets, doubtful assets, and loss assets. They are the loan assets classified as a non-performing asset as per guidelines of RBI. The gross NPA can be calculated using the below formula.

$$\text{GROSS NPA RATIO} = \frac{\text{GROSS NPA}}{\text{GROSS ADVANCES}}$$

NET NPA: Net NPA can be defined as the difference between a Gross non-performing asset and the provision made to write off non-performing assets.

$$\text{NET NPA RATIO} = \frac{\text{GROSS NPA} - \text{PROVISIONS}}{\text{ADVANCES} - \text{PROVISIONS}}$$

REASONS THE GROWING NON-PERFORMING ASSET:

There two types of reasons which are increasing non-performing asset. They are

INTERNAL FACTORS

EXTERNAL FACTORS

Following are the INTERNAL FACTORS which causes growth of NPA's

Business failure: A situation in which a company or other business is unable to generate sufficient revenue to cover its expenses.

If the business is unable to generate income, then it may not be able to pay the loan amount it has lent and hence after some time it is to be considered as a non-performing asset.

Funds borrowed for a particular purpose but not used for the said purpose.

For example, Anita has taken a loan to start a business, but instead of doing business, she constructs a house with the loan amount.

Then such type of loans may become irrecoverable and if it is not recovered within 90 days then it is to be treated as a non-performing asset.

Project not completed on time

Willful defaults: Willful default is a conscious abstention by borrower from doing that which reasonably and under the terms of the obligation he should have done.

Management disputes, frauds

Inappropriate technology: Due to improper technology and management information system, market-driven decisions on real-time cannot be taken. Proper and financial accounting system are not implemented in the banks, which leads to poor credit collection.

Improper SWOT analysis: SWOT analysis refers to the strength, weakness, opportunity, threat. Before lending a loan, banker should consider all these and then lend the loan.

Managerial deficiencies: The banker should follow the principle of diversification of risk based on the famous maxim "do not keep all the eggs in one basket", which means that the banker should not grant advances to a few big firms only or to concentrate them in sector's or in a small geographical area.

For example, let us take the case of IDBI bank, it has given Vijay Malaya a loan of 900 crores

Poor credit appraisal system: Improper credit appraisal is an additional factor for the increase in NPAs, due to poor credit appraisal the bank gives advances to those who are not able to repay it back. The bank should use better credit appraisal to reduce the NPAs.

Defective lending process: capacity to pay depends upon, Tangible assets, Success in business. Willingness to pay depends on, Character, Honest, Reputation of the borrower. The banker, therefore, takes utmost care in ensuring that the enterprise or

business for which a loan is sought is a sound one and the borrower is competent of carrying it out successfully, he should be a person of integrity and good character.

The EXTERNAL factors which are increasing non-performing assets are as follows:

INEFFECTIVE RECOVERY TRIBUNAL: Tribunal refers to a committee or board appointed to make decisions in a particular matter. There are the number of recovery tribunals appointed by the government to recover the loans and advances. Because of negligence and ineffectiveness in their work, the bank suffers the consequences of bad loans.

GOVERNMENT POLICIES: Banking sector gets new principles and policies for its operations with every new government.

WILLFUL DEFAULTS: The word willful defaults refer more negligence or carelessness.

The following are some willful defaulters

BANK	BORROWER	DIRECTOR	OUTSTANDING AMOUNT(CRORES)
STATE BANK OF INDIA	KINGFISHER AIRLINES	VIJAY MALLYA	120139.99
AXIS BANK	DECCAN CHRONICLE HOLDING LTD	VENKATRAMAN REDDY,T. VINAYAK,RAV RUDY,P.K.IYER	40934.00
BANK OF BARODA	SUBHIKSHA TRADING SERVICES LTD	R.SUBRAMANIAN	7499

NATURAL CALAMITIES: A major adverse event resulting from the natural process of the earth are called natural calamities. Because of irregularities of rainfall, the farmers are not able to attain the production level. Thus, they are not repaying the loans which are ultimately resulting from as NPA's to the banks.

CYCLICAL RECESSION: The industries which do not have appropriate project handling, effective management, adequate resources, and advanced technology such type of loan will end up with a low recovery.

IMPACT OF GROWING NON-PERFORMING ASSETS:

Banks will suffer low-profit margins.

The shareholders of the bank will lose a lot of Money as banks themselves find difficult to survive in the market.

The rate of interest will go up badly which will directly impact the customers.

The funds are getting redirected from good projects to the bad ones

Because of increasing non-performing assets in banking sector, it causes less money available to fund other project's

Liquidity problems may arise when bank do not get their loan amount back.

Banks will charge the higher rate of interest on loans to maintain the profit margin.

HOW TO OVERCOME GROWING NON-PERFORMING ASSETS:

SECURITIZATION AND RECONSTRUCTION OF FINANCIAL ASSET AND ENFORCEMENT OF SECURITY

ACT: According to this Act, if the borrower fails to pay his dues, then the banker can have the possession of the assets of defaulting borrowers without giving any notice.

LOK ADALAT: They can recover the non-performing assets which are up to 5lakhs.

Debt recovery tribunal: These are the group of people appointed by the government to recover the loans.

First DRT was set up in Ahmedabad in 1994. DRT in Hyderabad in1999.

BANKERS SHOULD BE CAUTIOUS: Banks should be aware before lending loans.

CONCLUSION: It can be said that non-performing assets are mostly due to mollified motives of the borrowers, lackadaisical monitoring and recovering system of the banks, bad management of the projects, financially unviable projects.

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COMPARATIVE STUDY BETWEEN PAYTM AND BHIM

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Abstract: The IT industry has made glorifying impact on various industries and it still continues to do so, to ensure its existence in the market, especially in banking sector. IT industry has its presence in banking industry through e banking. E banking allows a user to execute financial transactions via the internet. Online banking offers customers every service which is traditionally available at a bank. This paper aims to shine some light on benefits of e banking from the bankers and customer's perspective. It also aims to draw comparison between a popular e payment portal **Paytm** and a government e payment portal **BHIM**.

INTRODUCTION: The IT industry is playing a pivotal role in the banking sector; it has become a helping hand to them in catering the needs of its customers. Even though online banking has existed since 1980s, it gained its popularity mainly during crisis created by various external factors such as political, economic, etc. In the recent times the boom in banking sector was due a political factor, it has created craving for more development in the banking sector. The outcome of that is the substantial growth in E payments. Banks rely on gathering, processing, analyzing, and providing information to meet the needs of customers. The importance of information in banking is not surprisingly any new, banks were among the oldest adopters of automated information processing technology. The visible benefits of IT in the banking sector in India are quite well known. There is 'Anywhere Banking' via Core Banking Systems, 'Anytime Banking' via new, 24/7 on 365 days accessible delivery channels such as Automated Teller Machines (ATMs), and Net and Mobile Banking. In addition, IT has enabled efficient, accurate and timely management of the increased transaction volume that comes with a larger customer base. It has also guided the movement from class banking to mass banking.

Demonetization and its influence on online banking

The government's demonetization exercise announced on November 8 has given a huge push to digital payments in the country. Multiple factors and parallel institutional and behavioral trends seem to be powering India's transition towards a less-cash economy. The rapid penetration of smart phones and spread of internet connectivity on mobiles, digital payment services provided by non-banking institutions and the rise of the fintech sector, consumer expectations of one-touch payments, and progress in regulatory governance and tax breaks, have altogether shaped India's payments landscape in favor of digital solutions.

Paytm is an Indian e-payments and e-commerce brand based out of Delhi NCR, India. Launched in August 2010, it is a consumer brand of parent company One97 Communications. The name is an acronym for "Payment through Mobile"

BHIM Bharat Interface for Money (BHIM) provides fast, secure, reliable medium to make digital payments through your mobile phone using UPI (Unified Payment Interface) platform via Mobile App and USSD (Unstructured Supplementary Service Data) platform via *99# service.

Objectives of the study

- To study the benefits of E Banking.
- To compare two famous e portal Paytm and BHIM.

Research Methodology: Secondary source of information was used to collect information about benefits of e-banking like internet; various websites, e newspapers, official websites and blogs were referred. Primary data was collected using a structured questionnaire To analyze and compare the E Portals Paytm and BHIM. A sample size of 100 was taken and the questionnaires were equally distributed to both the users of Paytm and BHIM, which is 50 each.

Limitations

Convenient sampling method was used to collect data therefore it suffers from biases as the sample is unlikely to be representative of the population being studied.

The respondents were restricted to the area of Secunderabad.

Size of the sample does not have to reflect the population opinion.

Benefits of E Banking: Online banking permits customers to execute financial transactions through the internet. Online banking is also known as "internet banking" or "web banking." An online bank offers customers every service that is traditionally available through a local branch, including deposits, which is done online or through the mail, and online bill payment.

Convenience is a major advantage of online banking. Basic banking transactions such as paying bills and transferring funds between accounts can easily be performed at any time as per the customers' convenience. Online banking is fast and efficient. Funds can be transfer between accounts almost instantly, especially if the two accounts are held at the same banking institution. Banking accounts can be monitored more closely through online banking. This allows consumers to keep their accounts safe. Around-the-clock access to banking information provides early detection of fraudulent activities that has

the potential to cause financial or damage loss. Online banking facilitates the opening and closing of fixed deposit and recurring deposit accounts that typically offer higher rates of interest.

Advantages

Save time : Online banks saves time by dealing with your day-to-day banking business and we don't have to travel to banks just to perform a single transaction we can just do it by one click on the mouse from any place with internet access.

Get an overview of your financial situation: E Banking gives you an overview of your transactions. You can always check your balance, and you can prepare and handle more long-term budgets. We can also use e Banking to keep an eye on your pension savings

No more paper bills and piles of paper: We can get our bills directly via e banking. We will get a better overview of your financial situation and help reduce paper consumption through e banking.

Accounts Alert: Some banks recommend account alert set up, where an email or a text can be sent to the customer based upon the criteria they opt for. These alerts work to make monitoring your account easier.

Rewards for Going Paperless: Banks offer rewards in the form of rewards points or cash to help reduce the amount and cost of paper consumption. If we opt to receive bank statements online, it does not only increases the use of online bill payment, but frequent use of bank card would rack up rewards significantly and also helps in saving the environment in the process.

Mobility

Online banking can be done from anywhere, as long as you have an Internet connection. You can get your work done from any place in the world and you don't physically have to be present at your bank branch to get the work done. Some banks have created mobile applications that make banking easier for those with a Smartphone like the Apple iPhone or iTouch or a Blackberry. With this added mobility, we don't have to worry about missing a payment or any other time sensitive banking activity.

No Fees : Because an online bank doesn't have to worry about funding an actual bank location with all of those additional costs, fees can be reduced and are often non-existent. The checking and savings accounts that are offered by completely online banks don't charge fees at all.

E Portals: The emergence of technology in this most dynamic industry has helped in increasing the speed and efficiency of banking operations by facilitating the emergence of innovative products and new delivery channels Wider usage of mobiles and internet is playing a major role in blurring the physical boundaries, and unlocking a whole new world of opportunities for banks by tapping newer customer segments and in recording greater volume of transactions

Digital payments refer to electronic transactions, which include payments made for the goods and the services that are bought over the internet, mobile payments at point-of-sale (PoS) through a Smartphone applications (apps), and from peer-to-peer transfers.

Online or Mobile Wallets: Online wallets are used via the internet and through Smartphone applications. Money can be stored on the app via recharge by debit or credit cards or net banking. Consumer wallet limit is Rs 20,000 per month or Rs 100,000 per month after KYC. The merchant wallet limit is Rs 50,000 per month after self-declaration and Rs 100,000 after KYC verification.

Facilitates P2P fund transfers.

Prepaid credit cards

Pre-loaded to individual's bank account. It is like a gift card; customers can make purchases using funds available on the card – and not on borrowed credit from the bank. Can be recharged like a mobile phone recharge, up to a prescribed limit.

Debit/RuPay cards: These are linked to an individual's bank account.

Can be used at shops, ATMs, online wallets, micro-ATMs, and for e-commerce purchases.

Debit cards have overtaken credit cards in India. In December 2015, there were more than 630 million debit cards as compared to 22.75 million credit cards.

AEPS: The Aadhaar Enabled Payments uses a 12 digit unique identification number to permit bank-to-bank transactions at PoS. AEPS services include balance enquiry, cash withdrawal, cash deposit, and Aadhaar to Aadhaar fund transfers.

USSD: Stands for Unstructured Supplementary Service Data based mobile banking. Linked to merchant's bank account and used via mobile phone on GSM network for payments up to US\$77.68 (Rs 5,000) per day per customer.

UPI: The United Payments Interface (UPI) manages to be a system that powers multiple bank accounts onto a single mobile application platform (of any participating bank). Clubs multiple banking features ensures seamless fund routing, and merchant payments. Facilitates P2P fund transfers.

The new apps aim to ease the transfer of funds across India, especially in rural communities, and more importantly, seek to facilitate a behavioral change towards the greater adoption of cashless services. As such, the digital payments industry is fast becoming a highly attractive destination for foreign investors keen to establish a foothold in India.

BHIM: Bharat Interface for Money (BHIM) provides a fast, secure, and a reliable medium to transact through your mobile phone using UPI (Unified Payment Interface) platform via Mobile App and USSD (Unstructured Supplementary Service Data) platform via *99# service.

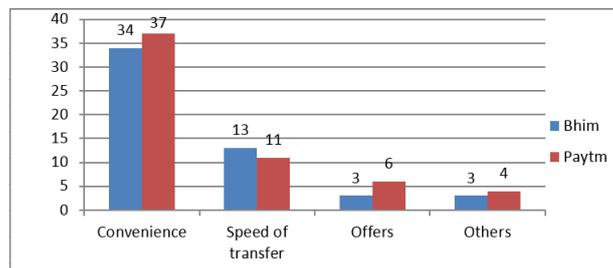
BHIM app was launched by Honorable Prime Minister on the 30th Dec 2016 and within 10 days, the app had gotten a corer downloads from Android Play Store and covered over 2 million transactions across both the platforms Unified Payment Interface and Unstructured Supplementary Service Data. BHIM is interoperable with other Unified Payment Interface applications, and bank accounts. BHIM is developed by the National Payment Corporation of India (NPCI), a not-for-profit company to provide retail payment systems in the country under guidance from RBI.

BHIM is designed for a quick and a secure user on-boarding, sports a best-in-class and innate user interface, and makes digital transactions seamless. BHIM has been a huge boon to all the merchants to accept payments directly into their bank accounts. All users, including merchants, are ready to use VPA (virtual payment address) and an exclusive, ready-to-print QR code upon sign-up.

Paytm: Paytm is India's largest mobile payments platform. It started with online mobile recharge, and today it has an online marketplace. In a short span of time, it has scaled to over 250 Million registered users. Paytm is the consumer brand of India's leading mobile internet company One97 Communications. Major investors of One97's include Softbank, SAIF Partners, Alibaba Group, Alipay, and Mediatek etc. They strive to maintain open culture where everyone becomes a hands-on contributor and feels comfortable sharing ideas and opinions. Paytm team spends hours designing new features and fixates even the smallest of details. Paytm has become the first Indian company to be funded by one of the top most Chinese ecommerce company Alibaba, in 2015, after it raised over 625 million dollars at a valuation of 1.5 billion dollars. Among all the investors Alibaba Group is the biggest stakeholder in Paytm parent company which is One97 Communications. Service is available through a browser, and an app is available on the Android, Windows, and iOS operating systems.

Paytm Wallet: The Paytm Wallet permits its users to book flight tickets and cabs, mobile recharge, and payment of DTH, broadband and electricity bills etc. The money transfer feature is only available on mobile, not on desktop. Users can also pay for fuel at Petrol pumps and buy movie tickets at PVR Cinemas through the wallet.

DATA ANALYSIS: Usage: **E Portals eases the work of transferring and payments in many ways, but it is mainly used because it's either convenient, saves time, provides offers etc.**



Analysis:

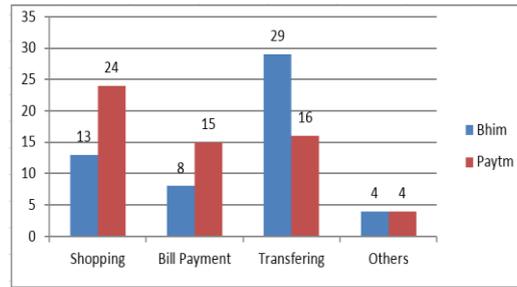
BHIM

Blue bar represents BHIM sample size which is 50 and their purpose to rely on online banking over cash. Most of them use it because they find it very convenient and the quick transfer facility it provides.

Paytm

It represented by red bar and the sample finds it very convenient to use when compared with the BHIM users. The respondents use it mostly because of the offers it provides. The speed of transactions is very less when compared to BHIM.

Purpose: These E portals are used to meet various needs of the people they provide services like transfer of funds, online shopping etc.



Analysis:

BHIM

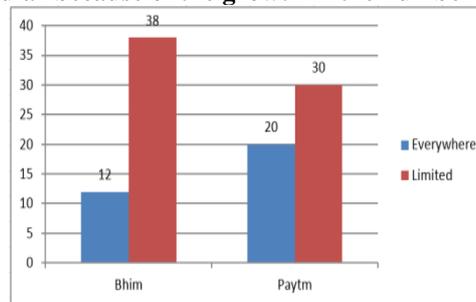
It is represented by blue bar and it is mostly used for transfer of funds by small business men from the rural areas.

Paytm

It is represented by red bar in the above graph, it is mostly used for shopping and bill payments purposes in the urban areas.

Accessibility:

E portals have become popular because of the growth in the number of mobile and internet users.



Analysis:

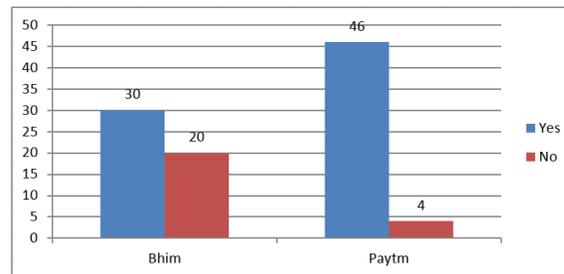
BHIM

BHIM is very limited to access, i.e, it is neither used by many people nor it can be found in any place to make payments or transfer.

Paytm

The respondents find it easy to access when compared with BHIM and it is available in many places, yet a few of them think it is necessary for Paytm to widen its scope of accessibility.

User Friendly



Analysis:

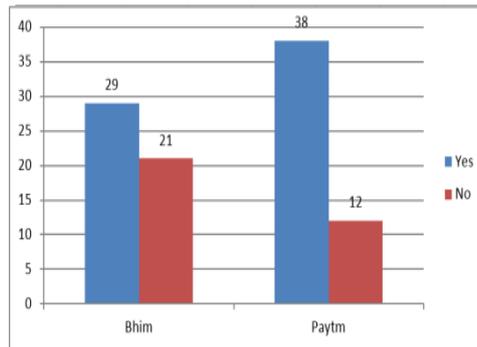
BHIM

The cluttered interface makes it slightly tougher to use than Paytm. You can make all the payments in three or four steps from its home screen which makes it very convenient to use. The speed of the BHIM app is also great.

Paytm

Paytm is excellently designed interface which makes it very easier to use app. It has a lot of different services such as mobile recharge, bill payments etc..

Transaction limit:**BHIM accepts a maximum of Rs 10,000 per transaction and Rs 20,000 limit within 24 hours.**



Analysis

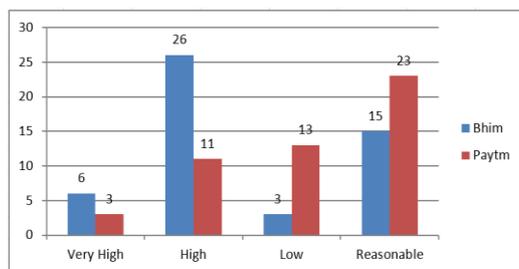
BHIM

BHIM users are not very satisfied with the transaction limit as it is mostly used by businessmen

Paytm

Paytm is used by people for shopping purpose they are satisfied with the transaction limit. Service Charges:

Paytm earns its operating profits from the charges it levies on the services it provides, where as BHIM does not levy any charges because it was set up with the intension to run a cash less economy by the government of India.



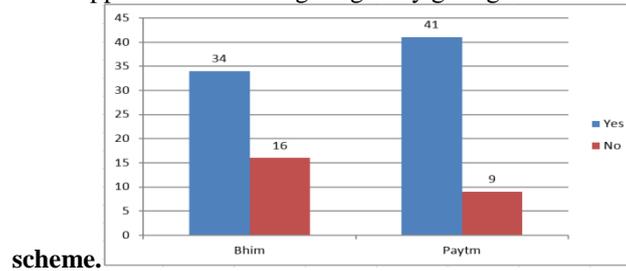
Analysis:

BHIM

Blue bar in the above mentioned graph represents BHIM users. Most of the users believe that it levies high service charges; few of them feel they are reasonable.

Paytm The respondents are satisfied with the service charges levied on the transactions. BHIM users think the charges on transaction are very high. Paytm levies reasonable charges on the transfer of funds.

Offers: Paytm gives too many cash back offers. Most cash back offers are only applicable to the payments using wallet money. Whereas, BHIM doesn't provide any cash back, however, it provides the lucky grahak Yojana and Digidhan Vyapar Yojana by using the BHIM app. Government is giving daily giving ₹1000 to 15,000 people under this



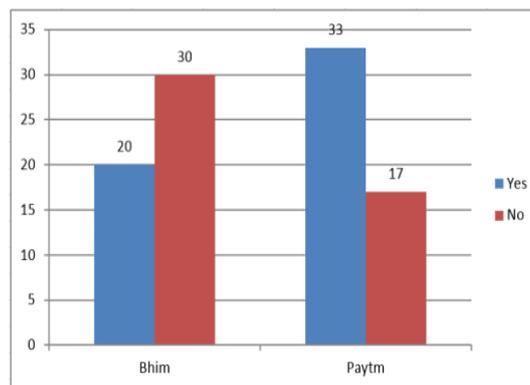
Analysis:

BHIM- It does not provide as many offers as Paytm does. The blue bar indicates the size of the sample which is satisfied with the offers that are provided by the BHIM and

Paytm

It provides various cash back and discount offers to its users which is not only satisfying its existing customers but it is also helping in gaining new customers.

Offer satisfaction:**Both the E Portals provide offers to their users to satisfy the existing customers and to tap new ones.**



Analysis:

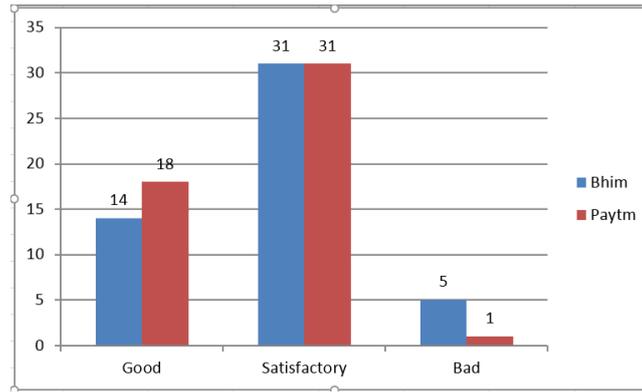
BHIM

BHIM users are not very satisfied with offers that it provides. The blue bar represents the number of users who are satisfied with the offers.

Paytm

Paytm users are content with the offers and discounts it's providing. The red bar represents the numbers of respondents who are not satisfied with the offers provide.

Security:**Security is one of the major concerns of most of the users of e portals, there are various e portals but very few of them provide a high security.**



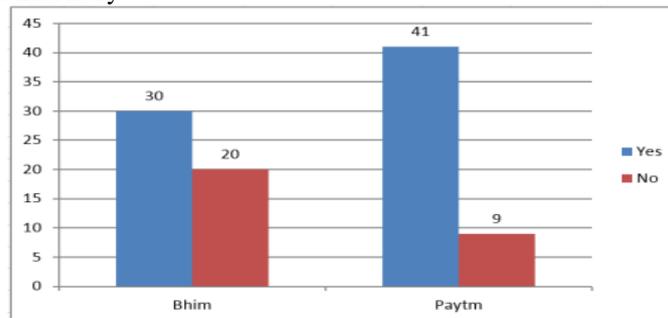
BHIM

The BHIM app has its own app password. No transaction can be performed without UPI PIN. Hence, if you lose your phone you do not need to worry about the money. The respondents are very satisfied with the security measures taken by BHIM.

Paytm

Even though most of the customers are very satisfied with the security measures taken by Paytm, a few of them still feel there is a need to provide more security.

Customer service satisfaction: No matters in which field we work in, customer are always the kings who must be treated very well. Customer services is necessary



Analysis:

BHIM

The respondents are satisfied with the customer care services provided by the E Portals, but a few of the sample think there is a necessity to improve its customer care services.

Paytm

Almost 82 % of the sample is very satisfied with the customer care services provided by Paytm and a very few of them are not content with them.

FINDINGS

1. The respondents feel that BHIM levies heavy charges on transactions.
2. The respondents feel that security of e- portals should strengthen to avoid frauds.
3. People in general are welcoming cash less transactions.
4. Currently we can access only one account per mobile number, so if a mobile number is linked to two different accounts these portals would not support.
5. Online banking should be made user friendly so that even a layman can access it and use it without any difficulties.
6. BHIM is facilitates quicker transfer of transactions than compared to Paytm

SUGGESTIONS

There is a need for an act to govern and regulate E Portals.

Restricting the number of setups of E portals business companies to exercise better control and regulate their activities to protect interest of customers.

A minimum interest rate must be provided to the customers on the money that is in available their e portal.

Service charges levied by e portals on transfer of funds must be monitored to promote the cash less transaction among the citizens.

Government has to address and issue guidelines regarding security measures that the e-portals should necessarily take.

The app has to incorporate authentication of two different bank accounts to one mobile number.

CONCLUSION: The rapid advancement in technology has enabled the Reserve Bank of India to initiate various technology based changes in the banking sector of our economy. In an environment of fast changing trends and ever-increasing demands of the users, IT adoption poses several challenges, spanning applications, security, network, vendor management and data management. With the exponential growth in the digital payments especially new age methods such as wallets, the ministry of electronics and IT is working on draft rules for digital payments which will deal with "consumer interests" and "security concerns." Currently, Reserve Bank of India is governing digital payment companies. There is a need for proper legislation be formed in consultation with the Central Bank to protect the interests of consumers and for an orderly growth of digital payments companies business.

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IMPACT OF GST ON THE INDIAN ECONOMY

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Abstract: In today's scenario we are levied in the form of direct and indirect taxes, which are too heavy to bear resulting in escalation of Indian economy. It is expected to remove the burden of existing indirect taxes on the meek shoulders eventually resulting in corruption. So, to curb various issues related to taxation system, the central government has decided to make one tax system i.e. Goods and services tax (GST). GST is one of the most revolutionary tax reforms in India. It is a comprehensive tax system that will subsume all indirect taxes of state and central governments tax system and play an important role in growth of India. GST includes all indirect taxes which will help in growth of economy and proves to be more beneficial than the existing tax system. GST will also help to accelerate the overall gross domestic product (GDP) of the country. GST is now accepted all over the world and countries are using it for sales tax system. This paper will highlight the influence of GST on various goods and services and its repercussions, and also the differences between present indirect taxes and GST on various goods and finally the impact of GST on Indian economy.

Key Words: Central, State, Dual, GST, Indirect Tax, Direct Tax, GDP, Economic.

Introduction:

Goods and service tax (GST)

Goods and services tax (GST) has become a reality from July 1. There are expectations that the tax reform will boost the Indian economy and bring phenomenal change from unorganized to organized sector. However, the experts anticipate few problems related to implementation of GST.

From the month of July, firms should file simplified, and self-assessed GST returns by August 20. They will have to file complete returns in early September that itemize and reconcile every single sales invoice. Surrounded by all this, the Central Board of Excise and Customs has once again paid attention to some common-use items - and their pre-GST tax rates - where the tax incidence is lower or equal ever since GST came into effect.

The tax rates under GST for products and services will be at five per cent, 12 per cent, 18 per cent and 28 per cent. There are also products that will attract zero per cent taxes. As per our Finance Minister Arun Jaitley the impact of GST will 'not be inflationary' and in some cases it is even likely to drop. With this, the Dream of our beloved Prime Minister Narendra Modi, ONE NATION ONE TAX has become reality.

Review Of Literature

A number of studies have been conducted to examine various sides to the introduction of the GST. The studies suggested some important issues of GST like Dual GST Tax structure,

where Federal and State Government will work cordially. Uniformity in Tax rate and distribution of the Tax between CGST and SGST etc. remain in the system.

Gupta, R. (2017)¹ this paper is a study of the new taxation system which is going to be implemented on 1st July 2017. Indian taxation system has undergone tremendous reforms during the last decade. The tax rates have been justified and tax regulations have been abridged resulting in better ambidexterity, simplicity of tax payment and better enforcement. The process of rationalization of tax administration is advancing in India. In this paper study is done that how GST will be implemented and what will be the impact on different sectors.

Tax Behal, V. (2016)² this paper puts an attempt to explore the impacts, implications and policies of introduction of GST in India. Goods and Services Tax is a broad based and a single comprehensive tax levied on goods and services consumed in an economy. GST is levied at every stage of the production and distribution chain. It is basically a tax on final consumption.

Sehrawat, M., & Dhanda, U. (2015)³ the paper is more focused on advantages of GST and challenges faced by India in execution. GST is one of the most acute tax reforms in India which has been long awaiting. It was supposed to be implemented from April 2010, but due to political issues and conflicting interests of various stakeholders it is still pending. It's a bird's eye view of tax system that will clarify all indirect taxes of states and central governments and unified economy into a smooth national market. It is expected to clear up wrinkles of existing indirect tax system and play a key role in growth of India. This paper gives the gist of GST concept and explains its implications from the beginning of its inception in India.

Khan, M., & Shadab, N. (2012)⁴ this paper is organized into seven sections. Section two presents absolute for dual structure of GST in India. The third part presents the rate structure under GST work in India. The fourth segment is concerned with the working of GST in India. The fifth part shows the international experiences of GST at state level in India. The seventh and final part is related to conclusion and policy recommendations. Goods and services tax (GST) is a broad based and a single comprehensive tax levied at every stage of the production and distribution chain with applicable set-off in

respect of the tax remitted at previous stages. Currently almost 140 countries have affirmed the GST pattern, including India. The GST would be advantageous for the consumers as it reduces the final burden of taxation.

Panda, A., & Patel, A. (2010) this paper is an analysis of what the impact of GST (Goods and Services Tax) will be on Indian Tax Scenario. The authors have stated with a brief description of the historical scenario of Indian taxation and its tax structure. Then the need arose for the change in tax structure from followed heritage to a new transformed GST model. GST in detail is been discuss in this paper by the authors as the key component, salient features and the impact of GST in the present tax scenario in India.

Research Gap

A few types of research were done on basic concepts and understanding the GST, some of the researchers have witnessed the importance of GST. However, the literature reveals that there is a big gap in terms of clarity on the impact of GST on Indian economy, hence, the researcher has made an attempt to the study how the impact of GST on Indian economy.

Objectives Of The Study

1. To study the tax rates on various goods after GST implementation.
2. To study the positive and negative impact of GST on Indian Economy.
3. To study Revised GST Rates which was held with GST Council.

Hypotheses

The related hypotheses of the study are as follows:

H₀₁: There is no significant impact of GST on Indian Economy

Now provide zero taxes under GST cover wheat/rice, unbranded flour, curd, butter milk,

Need Of The Study

This study will help us to examine tax rates on various goods . GST after its implementation, it will show the gap between present indirect taxes and GST, & also the study will show positive Impact and negative impact of GST on Indian economy.

Research Methodology

The study focuses on Secondary data collected from various books, National & International Journals, Government reports, Publications from various websites which has been published and dealt with various aspects of Goods and Service tax.

Before and After- GST On Various Goods In India

The pre-GST tax occurrence would be higher if the tax rate on account of CST (Central Sales Tax), octroi, entry tax etc. (which is more than 2 per cent) is also taken into account," said the CBEC, part of the revenue department under the finance ministry.

For example, items that unbranded natural honey and children's drawing books.

The earlier tax incidence on such items was in the range of 2.5 -7 per cent, according to the CBEC.

Table No.1 GST Rates for Metals and Minerals

ITEM	GST RATES %	OLD TAX%
Kerosene	5	17
Coal	5	12
Petroleum	18	27.5
Copper	18	18.5

Source: CGST Rules, 2017

Table No.2 GST Rates for Consumer Goods

Item	GST Rates %	OLD Tax%
Coffee & Tea	5	6
Veg Fats And Oils	5	12
Broom Sticks	5	18
Butter ,Ghee & Cheese	12	6
Tooth Powder	12	26

Source: CGST Rules, 2017

Table No.3 GST Rates for Construction

Item	GST Rates %	OLD Tax%
Sand Lime Bricks	5	6
Cement	28	30
Paints & Varnishes	28	26
Ceremic Tiles	28	26
Tempered Glass	28	26

Source: CGST Rules, 2017

Table No.4 Products at Zero GST Rates

Sl. No	Products
1	Milk and dairy products
2	Eggs and salt
3	Fresh fruits and Vegetables
4	Non branded cereals, flours
5	Non precious metal bangles & agricultural implements.

Source: CGST Rules, 2017

Table No.5 Tax on Goods under GST

%	Goods
0%	Food Grains ,Vegetables ,Fruits
5%	Sugar ,Tea ,Coffee, Edible Oil
12%	Juices ,Candles Leather , Bicycles
18%	Hair Oil, Tooth Paste, Soap
28%	Consumer Durables ,Cars

Source: CGST Rules, 2017

Impact of GST on the Indian economy

The plan of GST was first suggested in the Budget of 2007-08 by the then Union Finance Minister. However, after constant mull over and remaking, the Bill is finally coming into action on the 1st of July, 2017. In the outlook of many, GST will function as the liberation of our economic fascination, bringing about economic freedom in India. Not only it will make India the biggest self governing and free market but it will also change the Indian Taxation System

The Government and many leading newspapers of the country have made an effort to educate the general public about the pros and cons of this reform by bringing out essays on impact of GST on common man and telling benefits of GST to common man

After few months of adjustments it will improve Indian economy. Shower term for few months of stabilization it may slightly reduce GDP.

Impact of GST towards individual taxpayer

Following points shows the impact of GST towards individual taxpayers in India.

- **Revamp of the tax structure** – The fusion of all the taxes levied on goods and services have led to a simpler taxation structure. GST holds the character of being extremely simple and crystal clear in function leading to lesser accounting difficulties. This dominion has made the production sector highly competitive while making it economic.
- **Uniform tax regime** – GST has brought uniformity in the tax regime as it will benefit only one or two tax rates across the complete supply chain. This is simpler and more uniform against the then followed structure. Also, it provides a fair chance to all stakeholders while drawing attention to efficiency and not vantage points.
- **Inflated revenues** – One can expect greater tax revenues with this Bill as a simpler taxation regime would lead to greater and more efficient acquiescence , eventually moving to a larger number of taxpayers. This way, the government will be able to earn greater revenues as the cascading effect of the taxes would not affect anymore.
- **Push to exports** – As a result of the decline in production costs in Indian market, Indian goods will become more competitive in the international market. This will increase the exports from the country and would give us an edge over the world wide manufacturers that operate different cost structures. According to a study by the National Council of Applied Economic Research, the GDP of India can be expected to rise anywhere between 0.95 to 1.7% if GST keeps ruling for the next 3 to 5 years.

Positive Impact Of GDP

1. There will be single tax system for all other taxes such as vat ,service tax, excise duty ,etc which will make a unified market in terms of tax implementation and the transaction of goods and services .
2. GST will be more transparent in comparison to the existence provision so it will generate more revenue to the government and will be more effective in reducing corruption at the same time .

GST could boost India GDP growth by 0.9-1.7%. GST is a key for India s GDP in times of challenging global environment .

Negative Impact on GDP

1. As the proposed rate is 18% which is higher than current service tax 15%,so service will become costlier and it will lead to inflation for a short period
2. GST will impact the Real Estate Negatively
3. According to Government estimates Excise tax exemption , results in foregone revenue of Rs 1.8Lakhs.The comparative figure for the state is about 1.5 Lakhs crores .Together India loses about 2.7%of GDP because of exemptions

Changes Made in GST Council Meeting 6 Oct 2017

Registration Limit in GST is 20 lacs for Both Local and Interstate Sales

Earlier,
If a Person has turnover upto 20 lacs, they are not required to take registration
However if person is making interstate sales of even 1 Rupee, Compulsory Registration Required

Now,
If turnover is upto 20 lacs of Local + Interstate combined, then Registration Not Required

Earlier	Now
Compulsory Registration if Sales Within State > 20 lacs or Sales Outside State > 0 Rs	Compulsory Registration if Sales Within State + Sales Outside State } Greater than 20 lacs

File Quarterly Returns

Earlier	Now			
Every business had to file Monthly GSTR 1 } Always GSTR 2 } GSTR 3 } + GSTR 3B → For First 6 Months July – Dec 2017	<table border="0"> <tr> <td> If Turnover > 1.5 Cr. ↓ Monthly GSTR 1 GSTR 2 GSTR 3 + GSTR 3B </td> <td> If Turnover Upto 1.5 Cr. ↓ Quarterly* GSTR 1 GSTR 2 GSTR 3 + GSTR 3B </td> <td> Monthly for July, Aug, Sep 2017 Quarterly for Oct – Dec 2017 Onward → For First 6 Months July to Dec 2017 </td> </tr> </table>	If Turnover > 1.5 Cr. ↓ Monthly GSTR 1 GSTR 2 GSTR 3 + GSTR 3B	If Turnover Upto 1.5 Cr. ↓ Quarterly* GSTR 1 GSTR 2 GSTR 3 + GSTR 3B	Monthly for July, Aug, Sep 2017 Quarterly for Oct – Dec 2017 Onward → For First 6 Months July to Dec 2017
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Dealer Turnover Limit Raised

Earlier	Now
Composition Dealer Limit Normal States 75 Lacs Special Category States J&K Uttaranchal 75 Lacs Others (North Eastern + Himachal) 50 Lacs	Composition Dealer Limit Normal States 100 Lacs Special Category States J&K Uttaranchal 100 Lacs Other (North Eastern + Himachal) 75 Lacs

CONCLUSION: Taxation plays an significant role in the development of the economy as it impacts the efficiency and equity. It is expected that a good system should control income distribution and at the same time it will also Endeavour to generate tax revenue which will support government expenditure on public services and development of infrastructure. GST will have positive impact on Indian economy. GST have faced lots of controversy and opposition in terms of its implementation. Finally the GST bill has been passed and it ready to roll out in market.

Time will only decide whether it will have positive impact or negative impact. International trade Firms and consumer will have new system of tax which is single level and more transparent. The new system of taxation is considered to be more improved system over the pre-existing central excise duty at the national level and sales tax system at state level. The new tax will be brood denoting a logical step towards a comprehensive indirect tax reforms in the country.GST is not only Vat plus service tax but it is major improvement over previous VAT system. A single of tax will help maintains implicitly and

transparency by treating all goods and services equal without giving a special treatment to some types of goods and services. It will reduce the litigation on classification of issues. GST may affirm the possibility of overall gain for industry, trade, agriculture and also to central and state government. It is sure that India will join the international standards of taxation, corporate laws and managerial practices and also be among the world leaders.

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GOODS AND SERVICES TAX(GST): A PARADIGM SHIFT IN TAXATION

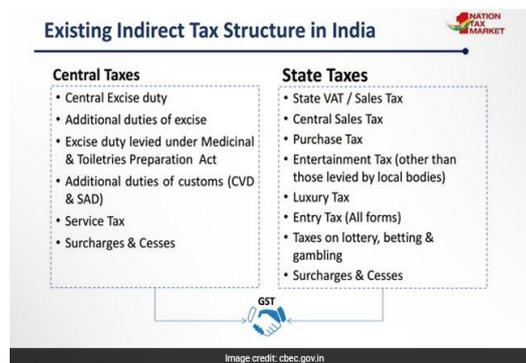
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Abstract: The Goods and Services Tax (GST) is considered to be a transformational reform in the Indirect Tax regime in India. It is a paradigm shift as the country moves towards ‘One Nation, One Tax, One Market’. The consumers, trade and industry will benefit. The manufacturers will be able to take rational decisions. The biggest challenge is to ensure that the benefit of input tax credit passes on to the consumer. With the introduction of GST the number of registered dealers has increased. This paper focuses on the GST benefits that accrue and the various challenges that have to be encountered whilst its implementation. It also focuses on the hurdles experienced by the tax payers in complying with GST provisions post GST implementation

Key Words: benefits of GST, Challenges of GST, GST concept, Input tax credit, profiteering

Introduction: The state sales tax was replaced by VAT in 2005. This replacement was considered a significant reform in Indirect taxes in India. The VAT is imposed at different stages of production of goods and services. At present the move towards ‘One Nation, One Tax, and One Market’ is the paradigm shift in the indirect taxes in the history of India. GST will merge all indirect taxes imposed by the centre and states, so there is (one country, one single indirect tax) One Nation, One Tax. (See fig 1 below)



(fig.1)

GST is a destination based tax. It is applied where the actual consumption takes place. Under the previous system, indirect taxes were collected at the place of origin whereas under the GST the taxes are collected at the place of consumption. It is levied at all stages right from manufacture to final consumption. Only value addition will be taxed. Before 1st July 2017, the state government levied some taxes and the central government levied some taxes, but GST is one unified tax instead of different taxes. There is no difference between goods and service in terms of tax rate. As it is based on the destination principle, the consumer of goods and services will bear the tax. The manufacturer/wholesaler/retailer whoever has paid the GST can claim through tax credit. The GST tax slabs are 0% (for exempted) 5%, 12%, 18% and 28%. (see fig.2)



(Fig 2)

Launch of GST in India: The GST bill was initiated in the first instance in 2000 by the Vajpayee Government and a committee was set up to design a GST model. The committee was headed by Shri Asim Dasgupta, the then Finance Minister of West Bengal. Later in 2003, under the regime of the same Vajpayee Government, the Kelkar committee was set-up to recommend tax reforms.

In the year 2006-07 the then finance minister said that GST would be implemented from 1-4-10. The Empowered Committee of State Finance Ministers (EC) had discussions with various working group officials which comprised of representatives of states and centre to examine the aspects of GST and based on the discussions, the EC released a discussion paper which contained the features of GST.

This was the base for the present tax regime. Constitutional amendment was needed for the introduction of GST as before the introduction of GST, the centre levied taxes on the manufacture of goods (central excise duty) and the state on the sale of goods (VAT), entry tax on the entry of goods in the state, luxury tax, purchase tax etc. In case of interstate sales, the centre levied the tax but then states collected and retained it. In case of services, the centre levied the tax. So, the amendment was made in the constitution (101st amendment) Act 2016 which empowers the centre and states to levy and collect the GST. To implement GST four bills were cleared in the parliament namely:

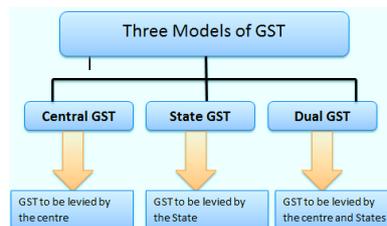
- The central GST bill 2017
- The Integrated GST bill, 2017
- The GST (compensation to states) Bill, 2017
- The Union Territory GST bill, 2017

Being implemented in over 160 countries, France was the first country to introduce it in 1954. In India the centre has given the introduction of GST as the top priority owing to the benefits that are attached with its introduction.

Models of GST

There are 3 prime models of GST

- GST at central government only CGST
- GST at state government level only SGST
- GST at both Union and state Government levels – Dual GST
- Non-current dual GST
- Concurrent dual GST



(Source:www.google.co.in) Fig 3

CGST: the centre will collect most of the country’s total tax revenue, leaving very little for the sub-national governments.

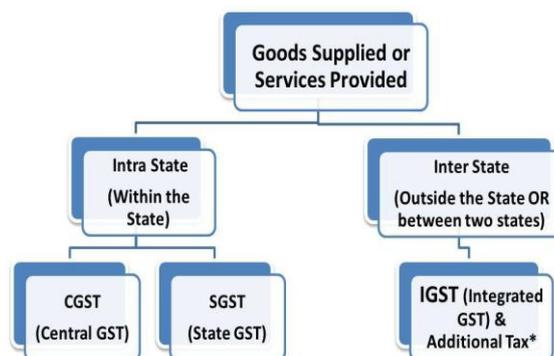
SGST: The states alone levy GST .

DUAL GST: GST is levied by the centre and states both.

Non-Current dual GST: Under this model the states levy GST on goods and centre on services.

Concurrent dual GST: This is the model followed by India. Under this model, both the central government and state government levy GST. All types of goods and services except few would be subject to concurrent taxation by the centre and the states.

GST Tax Structure



Source:google

REVIEW OF LITERATURE: Shefali Dani observes that the GST regime is a half-hearted attempt to rationalise indirect tax structure. According to the author GST will help remove inefficiencies under the current taxation system if and only if the issues of threshold limit, revenue rate and inclusion of petroleum products, electricity, liquor and real estate is resolved.

T.Venkatamaramana and T.Mahadeva Reddy observe that GST will help reduce the problems of tax system in India and lead to its improvement. This tax reforms provides a significant fillip to the investment and growth of our country's economy. To get the desired result, it should be ensured that the benefit of input credit is passed onto the buyers.

Prof.Yogesh and L.Ahar (2017) in their study has opined that GST has faced a lot of controversy and opposition in terms of the implementation. The author says that time is the deciding factor whether it creates a positive or negative impact. The new taxation system is considered an improvement over the pre GST system. It is sure that India, with the implementation of GST will join international standards of taxation.

Objectives

1. To study the benefits that accrues with the implementation of GST.
2. To evaluate the challenges imposed by GST.
3. To review the issues across India post implementation of GST.

Research Methodology

The paper is based on the study of secondary data collected from books, online journals, and government reports. It is an exploratory research. The descriptive type of research design is used.

Benefits of GST

1. Benefits to the consumer:

Reduction in prices: with the new tax rate in place, the prices of certain goods and services increase whereas the prices of other goods decrease. The change in the price depends upon the type of goods i.e. necessities, luxuries etc and the slab rates.

Input tax credit also reduces the price: with the input tax credit scheme, the cost of goods for the manufacturer reduces, and the consumer benefits with the reduction in selling price. The government should make sure that the firms pass on the benefits of reduced cost to the consumers.

Uninterrupted movement of goods: With the abolition of check posts at the borders, there will be uninterrupted movement of goods across the country. This saves the travel time and money. This in turn reduces the costs to the consumer.

2. Benefits to the businessmen:

Easy compliance with tax requirements: Before the introduction of GST the businessmen had to file several returns. Under GST, the businessmen are relieved from the botheration of filing many returns. The tax requirements have become much simple because of the single tax.

Uninterrupted movement of goods: The inter-state movement of goods would get delayed pre GST. But with the check post being abolished at state borders and also with the entry tax and octroi subsumed in GST the travel time and costs are reduced.

Platform for resolving the differences: The GSTN (GST network) a special purpose vehicle provides a single platform for resolving the differences between the tax-payers and the tax authorities. Also the GST portal makes it easy for the firms to file returns. Further in order to avail the tax credit, the invoices to be matched and the buyers to make sure that suppliers file returns and pay taxes on time.

Tax relief to the small traders, manufacturers, and restaurants: the GST benefits applicable for the small tax payers are that there is Tax exemption up to the aggregate annual turnover of up to Rs.20 lakhs (up to Rs.10 lakhs in case of North East states like Sikkim, Uttarakhand and Himachal Pradesh) GST registration and filing of returns also not required for those below the threshold limit.

3. Benefits to the Nation:

Make in India: The following benefits accrue under the make in India concept:

Development of common markets: Because of the uniformity in the process and centralised registration the manufacturers will now be able to decide sensibly about the sourcing of raw materials, sale of output etc

Reduction in tax burden: under GST because of the input tax credit, the manufacturers pay tax only on the value added. This reduced the cascading effects of taxation (tax on tax).

promotes the exports of the country; countries like New Zealand and Australia saw their exports have increased with the implementation of GST. It is expected that GST also helps India in enhancing the exports because it mitigates the cascading effect.

Increases the chances of business for every state and sector: Pre GST with different tax rates and many returns to be filed, the businesses had the tendency of allocating resources in that state and sector, where the tax rates and tax compliances are favourable to them. GST resolves this issue because it minimizes the tax compliance procedures and the rates of tax.

Enhances the competitiveness of small and medium business enterprises: until the implementation of GST, the small and medium enterprises with a turnover of 5 lakh rupees and above had to register for VAT. Also, if they had interstate operations, they had to hire tax professionals who would help them in complying with different tax rates, rules, procedures etc. GST makes it easier for the MSMEs with tax compliances and also with the benefit of input tax credit. This increases their competitive ability.

Promotes entrepreneurship: GST simplifies the indirect taxation. It reduces the cost by removing the cascading effects. It simplifies the tax compliance of filing of returns. It is paperless, transparent and fast. It promotes entrepreneurship.

Challenges of GST

Creating a strong IT and infrastructure: In India, there are many states, which still prepare the returns manually. For the effective implementation of GST it is necessary to have a strong IT infrastructure and trained manpower. A strong IT backbone is important for the effective implementation of GST.

Coaching the officers: GST rests on IT. Hence for the successful implementation, proper training has to be given to the officers who are dealing with the indirect taxes. It is very important that officers unlearn the old tax laws and learn the GST provisions.

Enrolment issues: There might be many new enterprises which want to register under GST. So, the issues of registration of new enterprises are going to be a big challenge.

Issues of Conversion: In order that GST is successfully implemented, there is a need for smooth transition. The transition issues like registration, input credit, filing of returns, job work transactions have to be dealt with smoothly. Though the transition rules are in place, resolving them is a challenge.

Resolving the cases of the pre GST: There are many pending cases in the pre GST instance. These have to be resolved to make for the disputes that might crop under the GST law. To resolve the past disputes under earlier laws, a new scheme has to be introduced.

Coordination between the centre and the state staff for effective administration: Pre GST in the central excise and service tax, the officers of the IRS were heading the department and at the state level, the commissioner is from IAS. With GST in place the centre and state level officers should work under one roof. Coordination between the centre and the state might be an issue.

Profiteering: In order to check that the benefit of input tax credit passes onto the customer, anti-profiteering authority is set up. Awareness is also being created among the traders and consumers. But it is likely that any minor policy lapses might be ignored and it might be effective in the large scale only.

Issues across India: Post-Implementation of GST

Problems of survival for the unorganised sector: After the roll-out of GST, the dealers and the shopkeepers prefer to purchase their supplies from GST compliant wholesale chains. This is posing a problem for the unorganised sector which does not maintain a proper GST compliant bills. Therefore to survive in the post GST regime, the unorganised sector will have to start maintaining a proper GST compliant bills.

Different invoices for goods with different GST rates: The shopkeepers dealing with different types of goods with different GST rates have to prepare different invoices. This is one of the issues concerned with invoice preparation.

Technical issues: the tax-payers and the dealers are facing many technical issues while they log onto the GST portal. The network is busy. There is a delay in the process by 3 to 4 hrs as the network is overloading. The problems of hanging and website crashes are occurring repeatedly. These issues make the tax filing problem more complicated.

No timely help and response from the help line centres: The GST help line centres when contacted over phone and email are not easily accessible for the tax payer. When the tax payer or the tax agent encounters with a problem in filing returns, the accessibility to the helpline centres is also not that easy. This makes the situation more adverse.

Revenue deficit post implementation of GST: In west Bengal, the state has witnessed a revenue deficit in the first four month post implementation of GST. The reason behind this according to the finance minister is the inability of the small and medium enterprises to register online in the GSTN portal. Many of the enterprises have registered manually.

Firms not passing on the benefits of input tax credit to the customers: Though the anti-profiteering clause is in its place, still there are some companies which are not passing on the GST benefits to the customers. On the basis of the complaints filed by the customer, the finance ministry is in the process of initiating an action against the dealers.

Too many forms and returns to be filed: Under GST a tax payer needs to furnish on an average 3 monthly returns and 1 annual return. There are a total of 37 returns every year that the tax payer has to file, though, there is an option to choose the periodicity of filing the returns either monthly or quarterly.

Suggestions

The launch of GST on July, 1 2017 is a transformative reform. From the above study, it is very much clear that the successful implementation of GST poses several challenges. But the benefits that are associated with its implementation are also worth mentioning. Countries like Singapore and Malaysia have a single rate of GST; India can also work on this. Time will decide how far, the implementation was effective.

Conclusion: GST is a major reform in the indirect taxes regime. It mitigates the cascading effect of taxes. Free inter-state movement of goods is expected. This will in turn boost the businesses. Though there are many challenges it is expected that India's GDP might increase. Though in the past few months the revenues from GST are far below expectations, it is expected to improve as the technology issues become stable. It is also to be noted that problems of transition to a new tax regime are unavoidable.

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IMPACT OF GST ON HANDLOOM SECTOR IN INDIA

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Abstract: GST is an indirect tax regime levied in India on the sale of goods and services. This GST replaces a number of central and sales tax and the impact on handloom industry is quite significant. In India, textile sector today comprises of four important segments as follows modern textile mills, independent power looms, handlooms and the garment sector. Handloom weavers are known for their knowledge, innovation and brilliance in design. The current impact of GST on Handloom Industry is negative, considering the fact that it is the second largest textile industry in the world after China. "Textile industry contributes around 4% of GDP, 9% of excise collections, 18% of employment in industrial sector and has 16% share in the country's export. India contributes for 12% of the world's production of textile fibers and yarn".

Key Words: GST, Indirect tax, Handloom Industry, Textile

Introduction

The Goods and Services Tax (GST) is a value-added tax levied on the goods and services sold for domestic consumption. The GST is the tax paid by consumers, but it is collected by the government from the businesses selling the goods and services. In return, GST provides revenue for the government. It is referred as Value-Added Tax (VAT) in some countries. The main objective of implementing the GST is to eliminate tax on tax i.e. double taxation which cascades from the manufacturing level to the consumption level and to bring in transparency in the economy. Basically, GST is an indirect tax that imposes taxes on the goods and services, manufacture, sale and consumption of goods and services, under a single domain at the national level.

The impact of GST on the textile sector is quite significant as this industry provides employment to maximum people in India about 35 million people which is the second highest after the agrarian sector. GST will fundamentally change the way the textile sector is presently taxed in India.

Classification of Indian Textile Industry:

The textile industry can be broadly classified into two categories, they are as follow:

1. Organized sector
 - A) Spinning mills or composite mills
2. Unorganized decentralized sector
 - A) Power loom segment
 - B) Handloom segment
 - c) Hosiery segment
 - D) Khadi & Carpet manufacturing segment

Handloom sector: Indian handloom is a part of India's heritage and its genius is known to the world through its handspun cloth. Indian handloom sector of the textile industry is ancient and has served the economy well in terms of employment providing direct and indirect employment to more than 45 lakh weavers & contributes nearly 23 % of total cloth production.

Handloom industry is the largest cottage industry in the country and uses agricultural products as raw materials and, therefore, provides an ever-ready market for agricultural produce. In the Indian economy majority of people rely on agrarian sector for their livelihood, hence the significance of handloom is well understood. It also gives employment to a lot of women and, thus, plays its role in women empowerment.

The per capita purchase of cotton textiles in handloom sector is 0.88 metres and aggregate consumption at all India level is estimated to be 989 million metres. National level consumption of pure silk textiles produced on handlooms was 116 million metres and 6 million metres in woollen in 2006. Handloom fabric production reached 6.9 billion square metres in 2011-12.

The GST rates for textile products and handlooms are majorly divided into:-

Tax-Free textile goods

5% GST (fibers & yarns)

5% GST with no refund of ITC accumulation-apart from this, there are also textile materials, tyre cord fabric, woven fabric & rubbers thread etc., which are charged with 12% GST. But whereas, the tax-free textile goods will be more clean, the basic raw materials like raw silk, coconut fibers, coir, wool, jute-fibers raw which are processed but not spun.

As this sector, is considered one of the major in India right after agriculture, a moderate rate was announced for the cotton sector & several other natural fibers.

Review of Literature

1. Dr. R. Vasanthgopal (2011) studied, “GST in India: A Big Leap in the Indirect Taxation System”.He concluded that the new tax regime i.e. GST will take some time to get into the minds of the public because the present tax system is already so much embedded in the minds of the people & he stated that the GST is the step towards positivity from that of current indirect tax system.

2. Government of India-Ministry of textiles (2015) have given a note on handloom sector. It has dealt with clear explanation of how the Steering Committee constituted under the Chairmanship of Secretary(Textiles) in the meeting held has decided that the major stakeholder of the handloom industry i.e. National Handloom Corporation will take up its role and give the guidance to the subsidiary companies which will be set up in the centre.

3. Tanushree Gupta (2016)-APS Rewa University, India has done a research work on Impact of GST on organized & unorganized sector. This study examines the implications of GST on the textile industry while a clear analysis of its estimates of the revenue rates for the relevant textile segments under the GST.She have also given a clear view of the subsidies which are given by the government & the relating supporting policies will have an impact on GST.

Objectives

1. To study the impact of GST on handloom industries.
2. To study the changes made by the industry due to the implementation on GST.

Importance of the study

The study makes an analysis of how the new tax regime “GOODS AND SERVICE TAX” is creating its impact in particular sector called Handloom sector. And apart from it by this study we can understand the changes made by the industry and how well the public is in par with those laws.

So this is important to be made for the present scenario to understand well about “GST” and its implications.

Need for the study

The review of literature revealed that very few studies are made on the topic “Impact of GST on handloom sector covering all the aspects of knowledge, involvement of public, interventions by the government and the change within the rules and regulations.

So there is a need for the comprehensive study like the present one.

Research Methodology

The study is based on primary data generated by administering a questionnaire to the respondents residing in the city Hyderabad.

Analysis and Presentation of data

The data obtained is analyzed with the help of simple percentages and presented in the form of pie charts.

The sample

The sampling method adopted is the convenience sampling method.

Sources of Data

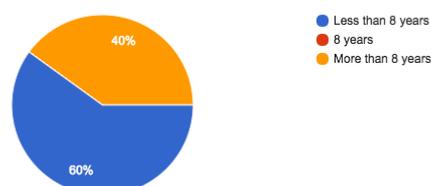
As explained earlier, the study is mainly based on primary data generated with the help of questionnaire using google docs. This is supplement by secondary data from various sources such as internet and already published papers.

Limitations of the study

1. The number of respondents are limited because of lack of time.
2. Greater number of respondents must have thrown a greater light on the study.
3. No tests of sampling and statistical tools are used because of short period of time.

Interpretation

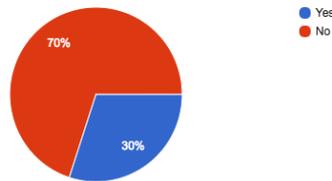
1. How long has your company been in the business?
10 responses



The major percentage of respondents (60%) business in handloom sector is not more than 8 years that they have commenced their business.

2. Does your company do online business?

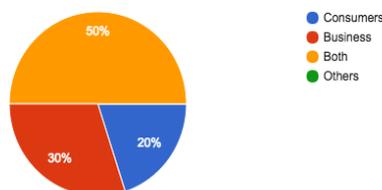
10 responses



In the above question we find that 70% of the respondents are not using online platform for their business as we still find handloom sector lagging behind with proper resources and knowledge about digital market and digital payments.

3. Does your company serve consumers, businesses or both?

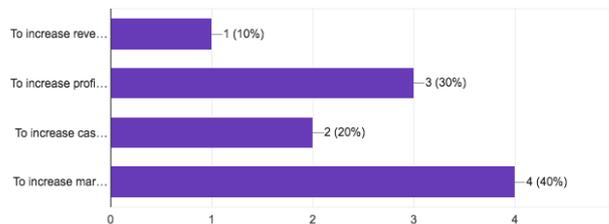
10 responses



In the above context the first priority when it comes to service provider or service receiver who serve only for consumers or business or both it is clear that the major market (50%) is showing their keen interest to act as a supplier as well as a retailer.

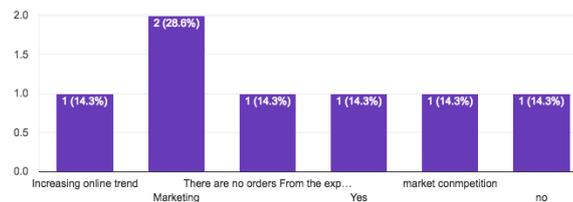
4. In the next three years, what is the most important aim for your company? Pick any 3

10 responses



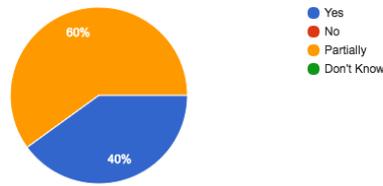
5. What factor(s) are the most challenging for your company presently in meeting with its revenue target?

7 responses



6. Are you aware of what GST is all about and its laws & different slab rates?

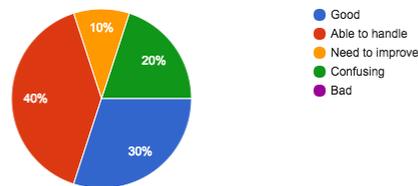
10 responses



As the laws related to GST are recently introduced into the country and still people are not completely acquainted with the whole of the regime, we find partial knowledge among the respondents related to GST and its laws and different slab rates.

7. How are you dealing with the implementation of GST?

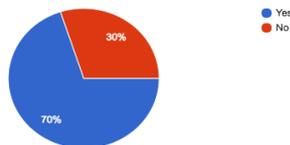
10 responses



The new concept which is above the past tax structure is still not functioning smoothly. So 40% of the respondents are managing and are in a position to handle, where 20%+10% are still confused as to how they should proceed with the new laws and changes.

8. Did the implementation of GST has cause a rise in the price of your goods?

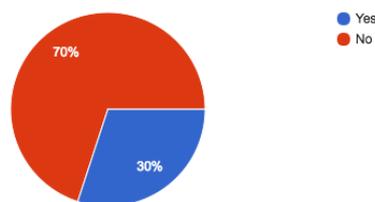
10 responses



The above data depicts us that in the present scenario because of GST there is a rise in the price of the goods (70%). This implies that it is creating a negative impact on view with the ultimate consumers.

9. Has GST hampered the rate of profitability of your company?

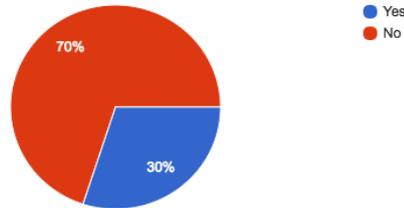
10 responses



It is obvious to know that the enhancement in rate of profitability of the business will be very low (30%) because still we find the business men are not completely educated about the changes made.

10. Do you feel GST slab rates are reasonable compared to CST?

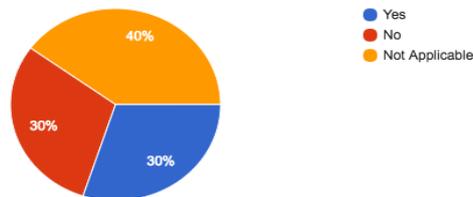
10 responses



Major respondents (70%) doesn't feel that the slab rates framed under GST are comparatively better to Central sales tax.

11. Do you see a rise in the demand for your services by clients after the GST implication?

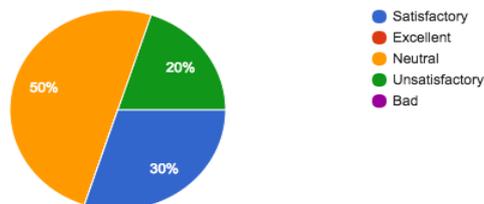
10 responses



It is observed that, the demand for the services of the respondents have been equally increased for few and decreased for few i.e. 30% and majority(40%) felt this question is invalid due to the frequent changes in the rates of the GST which was initially very high and then fell down to NIL.

12. What has been the turnover of the company after implementation of GST when compared to CST?

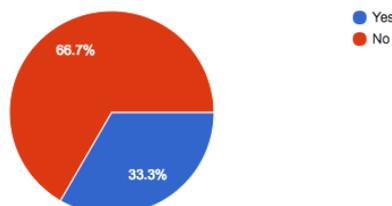
10 responses



Majority of respondents (50%) felt the turnover of the company was neutral & few(30%) satisfactory whereas, few (20%) unsatisfactory because of GST rates hampering the sales with higher rate of tax.

14. Did GST increase the working capital of the company?

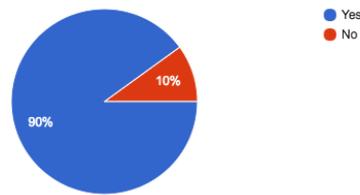
9 responses



From the respondents, the results show that there are no much of expenses incurred by the weavers (66.7%).

15. Do you think GST is a fair taxation policy?

10 responses



Public at large feel that GST is a fair taxation policy because this bring transparency in the economy and beneficial for long-run which removes the cascading effect.

Findings

GST presently has a negative impact and the major factors effecting after implementation of GST are reduction in sales, impact on stock import & exports, increase in price levels, decrease in the demand for exports etc., GST is a fair taxation policy promoting transparency and removing the cascading effect through single taxation system. Majority of handloom businesses are still not into digital marketing because of lack of education.

Suggestions and Conclusions

A clear view of GST and its laws must be clearly given to the public so that they can get educated with that particular law. A proper definition of Handlooms and all the products covered under the act must be given and propagated as handloom sector employees second highest right after agriculture sector. GST is a fair taxation policy but there must be some relief to the weavers as they cover most of the unorganized sector working.

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INTEGRATE WORKFORCE PLANNING AND CULTURAL STRATEGY FOR INTERNATIONAL STAFFING

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Abstract: Workforce force planning is the part of the leader strategy, enables the employer to be proactive in the recruitment, staffing and retention .Tools and process are made available in Human Resource Department, to allow other department to determine their workforce future requirement for both grants and non-grants program for long terms and as well as short term. Forecasting tool is also available to offices to align with recruitment strategy. Today in period of globalization senior workforce planning is the best practice. Senior leadership is busy in collaborativesupport and effort to other departments. Alignment of workforce planning process and organizational strategic planning and process can be available. It defined ‘buy ‘ or Build’ talent acquisition strategy. Workforce planning not seen as one off event but mainstreamed in the overall operations formalized and standardized workforce planning, not seen as one off event but mainstreams in overall operations, align financial and Human Resource data and use technic and analytical software.Research mythology uses is primary as well as secondary data. It also will highlight the challenges inWorkforce planning through primary data. And various books, Journals, website are uses for secondary data. Scope in research is wide because it high light energy trends in workforce planning, it provides talents, rewards and complete package to organization. It offered learning opportunities,] monitoring benefits are considered, to take into consideration real time appreciation and periodical recognition of individual, team and organization. It highlights benchmark connection with heads of human resource from corporate, non-profit organization, professional bodies and consulting firms.

Key Words: Workforce planning, International Staffing Challenges, Strategies

Introduction

The traditional practice of provision standard and issue hardware andsoftware not only yield lackluster result in creativity and productivity, but also establishes confidences of employees in their company’swiline to invest in them and their organization future.

To avoid employee’s turnover and corporate decline, leaders must empower their employees with technologies that will enable them to give them best and reach to full potential. Through Workforce Planning employers can foster greater productivity and create happier employees in enterprise.

Workforce planning is process to ensure right number of people with right skills in the right placeat right time to deliver organizational objectives.

We need today to understand full concept of workforce planning and need to introduce the devices/steps and flexibility for the 21st centuryworkplace. Role of information is also to provide right tools and devices to its employees so they can get their jobs effectively. It needs to offer an overall workplace eco system that is secure and innovative. However, there is worrying gap andstreamline daily to how to frame strategies and need to implement it.

Workforce planning falls into two categories.

1. Operational workforce planning
2. Strategic workforce planning

Operational workforce planning - is person to person level, streamline daily employees to related operation. This approached can help managers develop work schedules and employees hours to maintain business productivity and continuity.

Strategic workforce planning - includestalent management. And can help to ensure talent as well as, skills distributed among division department, as well identify organization need on number and types of employees required and types of employees required to do those job. It also pinpoints staffing gaps, which job functions and process are no longer necessary and whether work should be reassigned to other job,

It also put practice policies to help employers. It deals with broad based issues that develop over month and or at macro level, an example establishing an effective workforce an analytics strategy, itbenefits workforce planning software. Employees human resource can schedules employees working hours and shift using accurate labour and sales forecast their matches demand labour to land.It help managers to prepare retirement and design talent acquisition strategy to replace retiring employees. Workforce force planning is the part of the leadership strategy, enables the employer to be proactive in the recruitment, staffing and retention .Tools and process are made available in

Human Resource Department, to allow other department to determine their workforce future requirement for both grants and non-grants program for long terms and as well as short term. Forecasting tool is also available to offices to align with

recruitment strategy. Today in period of globalization senior workforce planning is the best practice. Senior leadership is busy in collaborative support and effort to other departments. Alignment of workforce planning process and organizational strategic planning and process can be available.

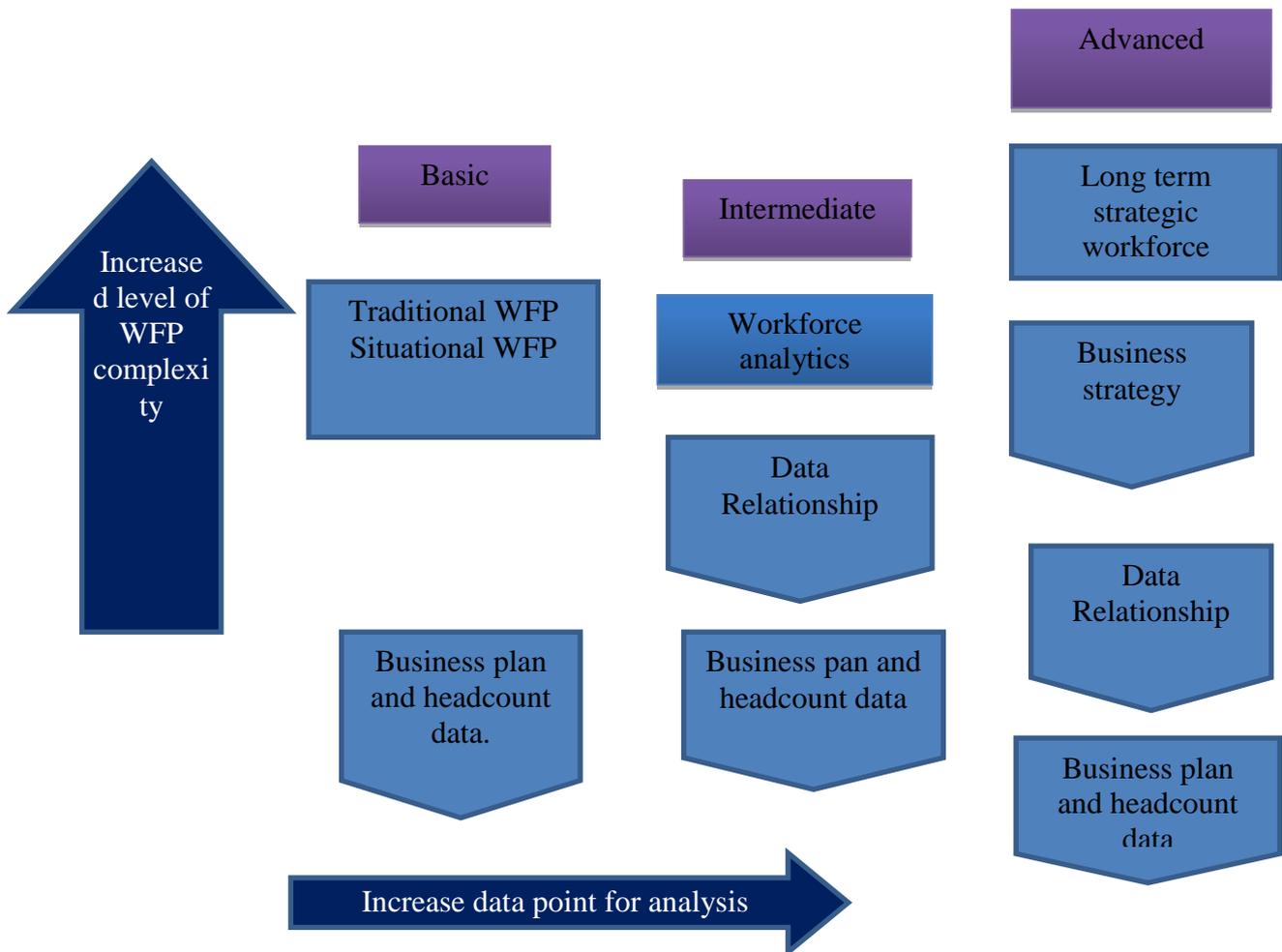
It defined ‘buy’ or ‘Build’ talent acquisition strategy. Workforce planning not seen as one off event but mainstreamed in the overall operations formalized and standardized workforce planning, not seen as one off event but mainstreams in overall operations, align financial and Human Resource data and use technic and analytical software.

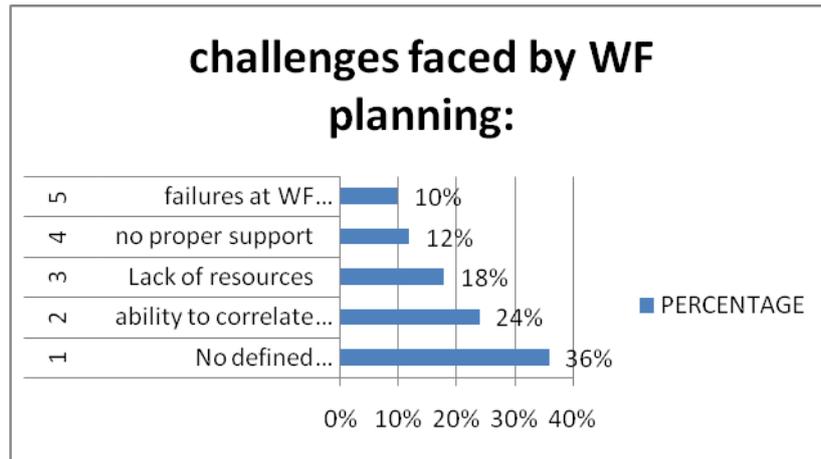
Workforces planning provide total reward and complete package to organization’s as it offered learning opportunities, monetary benefits are considered, real time appreciation and periodical recognition of an individual, team, organization. It highlights benchmark derivatives with heads of human resource, from corporate, non-profit organization and consulting firms.

International staffing strategy involves early projection of need of staff. It target selection behavioral interview. It clearly indicates [partnership and ownership process. It provides leadership recruitment assessment center for national director and executive. Low cost advertising using social media drives, higher percentage of qualified and passive applicants.

Trends in staffing are focus on internal candidate. It believes in build rather than buy. Through LinkedIn and Facebook just in time sourcing and online communication. Hiring competition in selected areas e.g. China, SE Asia, Austria and India Also focuses in contracting and using part time workers. It aims at employment branding and employees Referral.

Workforce Planning Implementation Stage





Primary data is collected from the manager from top companies asking them challenges faced by them in workforce planning. Finding is as follow. It is found 36% manager feel that greatest challenges is that there was no defined metrology or business process 24% believe that ability it is difficult to correlate business strategy with workface requirement.18% manager faces the challenges of lack of resources. 12% Manager feel lack of support from top. 10% blame failure at workforce planning in the past.

My conclusion and suggestion is as follows for a best practice in workforce planning is as follows:

1. There should be value driven recruitment system.
 - 2 Innovative techniques should be used.
 3. Flexibility and wellness at workplace I utmost importance.
 4. There is need for family centric approaches towards staff wellbeing.
 5. Building engagement using social media.
 6. More career opportunities should be provided.
- There is need for top management communication outreach.

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ERP - A KEY TO ACCELERATE GROWTH IN HIGHER EDUCATION INSTITUTIONS

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Abstract : The success of Enterprise Resource Planning (ERP) in the business world has been phenomenal. To emulate this success ERP solutions are being customized and introduced to suit the requirements of higher education institutions. Educational stakeholders are demanding efficiency and transparency. There is upward mobility of students transcending borders, and changes brought in by Information and Communication Technology (ICT) has compelled the need to have information on the fly, without any restrictions imposed on place and time. Management is forced to meet this growing demand by introducing ERP systems, to keep abreast with the competitive world. As accountability, flexibility, integrity and efficiency have become the new buzz words, there is huge potential to explore the applications of ERP systems in higher education institutions. This can accelerate growth and become a yardstick not only to measure its effectiveness but also to make it distinct from other institutions both within and outside the country.

Key Words:ERP, Integrity, Stakeholders, Management, ICT, Higher Education

Introduction

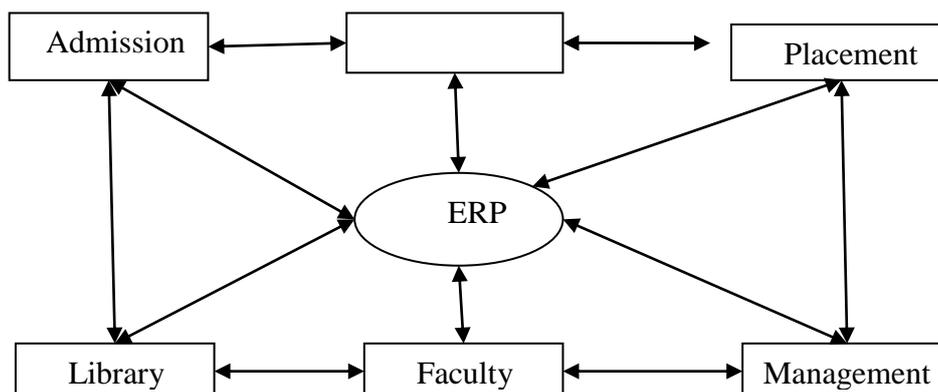
With more number of educational institutions trying to be efficient and manageable, there is huge potential to explore the applications of ERP systems. Although the opportunities and challenges of present day are entirely different from that of past, the quest for maintaining transparency continues in the academic world. ICT has enabled the educational institutions to employ innovative techniques such as smart classrooms and online courses, further simplifying the management of higher educational institution needs with respect to HR, inventory, finance, and other services. ERP helps the educational institutions in effectively managing admissions, maintaining student records, class wise and subject wise data/documents, library management, exams and grades management, and alumni records together with teaching and non-teaching staff details at a single place. The flow of information between parents, students, staff, and alumni etc. further increases transparency of student mobility, institutional policies, and smooth processing of operations, and maintenance of data/documents.

With the widespread introduction of ICT, there has been a paradigm shift from decentralized system towards centralized system for information and data management. The business processes are actually business functions which generates information for management. In a centralized data management system, the business functions are confined to a particular department, giving no scope to interact with other departments, as shown in *Figure-1*. A student makes a request to know the fee details, but may fail to understand why he/she has not been eligible to write the exams as these details are not accessible and can be procured only from the examination cell, which is another department with specific functions relating to the administration of marks and evaluation processes.



An ERP system is an integrated model based on centralized system of information and data management. An integrated model allows the modules or functional areas to talk to each other, sharing information that is based on data integrity and eliminating information silos that exists between different functional areas of an organization. For eg. if a student wants to make an enquiry about his/her fee payment along with performance, attendance etc., this can be easily deployed as the data is maintained at a central location and is shared by other departments as shown by the sample integrated model as shown in

Figure-2.



The sample integrated process for student admission till performance are elucidated using the four main important elements viz. input, functional area, process and output to generate information is tabulated in Table-1. The processes require input for each functional area and then reports are generated as output which clearly shows that the processes are inter-dependant.

Input	Functional Area	Process	Output
New student enquiry	Admission	Course details	Application form is generated
Fee particulars	Accounting & Finance	Scholarships	Fee payment
Admission fulfillment	Student database	Student record	Student Unique Id
Student Unique Id	Examination	Evaluation System	Performance Analysis

Table 1

Objectives:

- X. To assess the flexibility offered by ERP systems to educational institutions.
- XI. To study the complexity in ERP system selection, and the challenges during ERP implementation.
- XII. To explore various strategies for resolving functional issues, and effective usage of ERP systems.
- XIII.

Scope & Methodology:

This paper limits itself to implementation of ERP to educational institutions and attempts to identify and explore issues in context to Loyola Academy (LA) Degree & PG College, Alwal, TS, India. The study also explores the means to enhance optimal satisfaction from ERP system usage.

Data sources collected for this study are both primary and secondary in nature. As LA had recently implemented (year 2017) ERP system in the campus, the information relevant to implementation process was collected from college management, IT staff, teaching faculty, and students, mainly through open-ended questions. The secondary data is collected from journals, e-books, web sources, and reputed media reports.

Flexible Solutions for Educational Institutions

ERP system usually automates and integrates both academic and administrative activities of an educational institution. While the academic activities include admissions, recruitment, registration and various aspects of students record management, the administrative functions refer to accounting, billing, human resources, and payroll. The one time investment in ERP systems enables the institutions to have decreased costs/expenses in the long run, ensuring greater efficiency and ease of management by offering various portals for staff, students, parents, recruiters, alumni, and management. The pertinent information is made accessible anywhere anytime to the users with the portals that provide illiberal control over viewable data or modules.

Need for ERP System: Though the use of ERP software solutions has expanded to 'back office' functions like inventory management, personnel, finance, and asset management, (from the initial manufacturing planning systems), since late 1990's, the implementation of the same in higher education sector is still trailing behind. While the application of ICT in educational institutions is being considered as one of the key factors in quality assessments, and the expectations from the stakeholders is on the rise, there arises a definite need to implement suitable ERP systems in colleges/universities.

Benefits of ERP System: The following are various benefits offered by ERP system to the higher educational institutions

Database Access: ERP automation helps the educational institutions in effectively managing admissions, maintaining student records, class wise and subject wise data/documents, library management, exams and grades management, and alumni records together with teaching and non-teaching staff details at a single place. Better student/faculty record management ensures fewer mistakes, duplication, and missing documents.

Management of funds made easy: Students and management can have a better clarity/transparency about tuition fee, scholarships, examination fee details, etc. It also assists the management in ensuring effective spending of funds and efficient maintenance of records for audit purposes.

Improves staff productivity/efficiency: ERP automation allows the staff to conduct academic matters in an efficient and well organized manner by enabling few staff to manage similar tasks and allowing other members to focus on productive work including research programs. The enhanced faculty engagement, ensures increased knowledge/skill levels and less staff turnover.

Enhances operational efficiency by reinforcing relationships: Automation creates an interactive platform by offering transparency of attendance and evaluation to various user entities such as management, staff, parents and students.

Administrative Purpose: ERP automation enables the institution to have a clarity on various aspects of human resources & admissions, faculty & student management, hostel & library management, finance management, examinations & result analysis.

Adaptability/Accountability: ERP systems enable program alerts and controls like using computerized email notifications of budget allocations and probable spending patterns. It further allows parents to know the progress of their ward and makes staff more accountable in handling their responsibilities.

User Friendly: ERP system consists of a student friendly portal which is easy to access and offers complete information about academics, attendance, extra-curricular activities, placement guidelines, evaluation system, or rules for academic promotion etc. It further simplifies and coordinates student enrollment functions ensuring higher success rate.

Possible Risks/Challenges in Implementation

Risks of ERP system: The following are the possible risks associated with the effective implementation of ERP software solutions in higher educational institutions

Complicated Initiative: As the implementation of ERP software solution is highly complicated, the best strategy is to implement it in different phases. A small functional area has to be selected initially, followed by big, to avoid chaos and confusion during the implementation process.

Selection of Appropriate Vendor: Selecting a suitable vendor who can offer customized solutions according to the needs/requirements of the institution is important. A team involving a few faculty and management members should be encouraged to attend various demo sessions offered by different vendors and select one solution that suits the institution the best. As customization options are usually expensive, the management should decide the vendor by further comparing both initial costs and annual maintenance. Majority of vendors are usually reluctant to give pricing details unless a formal proposal is made.

Reluctant to change: With the availability of many customized software solutions for finance and library requirements, institutions might hesitate to adopt ERP software solutions, as it's very expensive and complicated. Any small negative experience during the execution process can discourage the institution to go for further implementation.

Training: Training the faculty with different aspects of ERP automation is very important for successful execution of the system. As the data is shared across the institution, it is very important to have IT faculty who are well trained to handle technical problems.

Unrealistic expectations: Once the system is implemented in the institution, it is expected to deliver excellent results. If the programme is executed in a phased manner, there is a possibility of having hassle free environment during the automation process.

Acceptance of System: ERP solutions that suits one institution might not be suitable for another. The software has to be customized according the requirements of the institution.

Further, the failure of ERP system can be due to poor planning/management, change in institutional policies/goals, improper phase wise execution strategy, ineffective training to faculty, lack of infrastructure upgradation, lack of business management process, lack of pre-implementation tests, and post-implementation maintenance.

Strategies for Effective Implementation

Today many organizations want to implement ERP systems replacing the conventional and legacy systems. According to a study made by Panorama Consulting Solutions, LLC., in the year 2016 it cited various reasons to replace viz. out-of-date ERP software (49%), homegrown systems (16%), accounting software (15%) and other non-ERP systems / no system (20%).

Identifying the appropriate system: While implementing an ERP, it is important to have a good understanding of the existing system in terms of functionality and output for smooth flow of processes that help in decision making without having any bottlenecks.

Structuring requirements: Design a database that is inclusive of all functional requirements. Minimize customization and maximize customer satisfaction is the key to the success of a good ERP system as it is not necessary to reinvent the wheel every time we come across a new process or challenge. At the same time one must be aware that the cost of implementation increases whenever an update occurs real time.

Delegation: It is also imperative to identify the resources that are available and to delegate the responsibility of implementation to an employee or management member who has sound knowledge about the system.

Training the personnel: Adequate training has to be given for the staff to understand the travails of the end-users as higher education system is very dynamic and different in different educational institutions especially the autonomous and the non-autonomous colleges and universities.

Support system: The key to the success of an ERP system lies in the fact that it is initiated and controlled by someone who has strong leadership skills, who is committed and dedicated in realizing the strategic goals set up by the institution. Support should be given by experienced personnel from different functional areas like admission, evaluation, staff management, student life cycle management etc. by giving them a significant role in discussion and implementation.

Continuum: Every person involved in its implementation has to understand that this is an on-going process and hence has to be proactive and dynamic to change. As ERP is based on the information of an organization, accurate data has to be supplied without hiding any details be it the rules for promotion, evaluation system, admission process, or staff recruitment and training etc.

Case Study of Loyola Academy for ERP implementation

Background: Loyola Academy (LA), Alwal, India is an autonomous college and a minority institution, managed by the Society of Jesuits. It has a massive strength of 2500+ students and around 200+ staff members including both teaching and non-teaching. The college runs 20 undergraduate and 5 post graduate programmes along with skill enhancement certificate courses.

System: There are many departments with functional specifications like admission, attendance, evaluation, placement, library, finance, sports & games etc to name a few. Every functional area is focused on maintaining records for it independently, without interacting or disseminating information to another.

Issues and Concerns: It was observed that lot of time and effort was invested in maintaining the records. It was also observed that there was no facility for the flow of information from one functional area to another. There were lots of redundant data as information was confined to specific functional areas. Every department was using different computerized software with little scope for communication, creating a vacuum of information dissemination. This led to stress and not able being able to react positively in times of dispute and conflict.

Planning: Initially at the planning stage some of the dedicated and committed staff along with some members of the management were involved in guiding and disseminating information about the existing system on various aspects of student management in terms of admission, examination, academics etc. Staff management information in terms of recruitment, workload, additional responsibilities etc were also given. Other information related to library, finance etc was also clearly defined. First-hand information was given about the gaps that exist between the various functional areas.

ERP Implementation and Outcome: Admission was the first module taken up for ERP implementation. Later modules for attendance, examination, leave management, staff management and purchase management were implemented, and the finance module is yet to be implemented fully. ERP implementation at Loyola Academy has empowered the staff with uniform information about the strategies and goals of the institution, as well as involving them in key decision making. The system is secure and cost effective and is also very efficient in saving time and cost, giving more scope to focus on education and its challenges, be it research, consultancy and extension activities.

The staff has become more committed and dedicated as there is no scope for error and if it is made, then due to its transparency it becomes mandatory for everyone to follow the procedure, lest they are left behind, as the college surges ahead in its growth and quest for excellence.

The students have become more alert and knowledgeable about the system at Loyola be it academics, extra-curricular activities, placement guidelines, evaluation system or rules for academic promotion etc. The students are also thrilled to know that information is accessible to them throughout the day without any time constraint.

For the management it gives a clear picture of fee collection, funds management, optimum use of resources, staff efficiency and student performance. Since ERP implementation is in its nascent stage, every person or stakeholder involved with the institution understands the dynamics of it, as the educational system at Loyola is very dynamic and unique upholding the privileges of autonomy.

However, at Loyola Academy there is increased distress among the faculty who feel that the servers are slow in handling several users at the same time and they feel that sometimes lot of time and effort is wasted in just completing an entry be it for attendance or marks. The students too feel that the system is too rigid as it takes lot of time in resolving issues.

Conclusion

Since the benefits of ERP overshadow its failure, an ERP system is quick in providing answers and resolving disputes, if there is clarity in identifying the problem and being more proactive to challenges. The main strength of an ERP system lies in its user friendly interface, giving instant access to data and using the information for effective decision making. And in this age of internet and digital communication, it has facilitated mobile ready applications that are safe and secure to use. To top it all, it propagates the use of paperless transactions. The management should also understand that compelling its staff to

use it without proper training and guidance will lead to increased stagnation of growth and distress. The staff needs to be supported, rewarded and recognized in their efforts to collaborate with the organization's goals and objectives. It is only the autonomous colleges and universities that are able to implement an ERP system. Hence the government should provide subsidies, monetary assistance and consultation to colleges and universities in implementing it.

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IMPACT OF HUMAN VALUES ON ORGANISATIONAL PRODUCTIVITY

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Abstract: The Human element in an organization drives it forward to achieve its mission, vision, plans and objectives so as to make it successful and sustain itself. The present article is a descriptive study which focuses on managing human resources effectively so as to improve organizational productivity efficiency. It seeks to analyze the influence of human values & organizational productivity in the Indian organizations. Its core elements such as Job Performance, Employee Engagement and encouraging the employees to imbibe the finer values of life to be better individuals at the work place. Purposive systems are enabled by negative feedback to liberate outputs, to some degree, from random or contingent factors, so that relative constancy of actions toward goals can be maintained over time. Such relative freedom is vital for life, but depends on an enabling organization. Such as account points to possibilities for a more objective account of the nature and role of human values, with implications for epistemology, ethics and the philosophy of mind. And also suggests that, in a politically free society, the authority must be a function of the needs and goals of the individuals within it. Suggestions have also been incorporated to add values to the topic reviewed.

Key Words: Human values, employee engagement, organizational productivity.

Introduction:

Decision making was long in methods of prioritization but now needs to complete the scope of its structures to become a dependable science that can be helpful on the micro level. Most of the factors that determine the structure of a decision depend largely on the feelings and memories of the decision makers and that leaves room for doubt about the general well-researched list of factors for some of their complex decisions in order to have greater assurance that their decisions are comprehensive and right. To do that, they must have wide exposure and be familiar with the full spectrum of human values and environmental opportunities. This course addresses problems and issues concerning leadership, interpersonal effectiveness, and challenges for managers in the 21st century. Each of us holds numerous values with varying degrees of importance. A particular value may be very important to one person, but unimportant to another. Consensus regarding the most useful way to conceptualize basic values has emerged gradually since the 1950's. We can those main features in the writings of many theorists and researchers as follows:

Values are beliefs. But they are beliefs tied inextricably to emotions, not objective, cold ideas.

Values are a motivational construct. They refer to the desirable goals people strive to attain.

Features:

Job performance : Performance, output and productivity form the backbone of organizations. High performance, high commitment and loyalty are the desired expectations of organizations. Individuals enter organization with some needs, aspirations and expectations about work life. Organizations on the other hand, focus on product of ability and motivation, which may be presented as performance = [ability x motivation] ability here may be interpreted as a competence, skill or knowledge. The interaction of the basic abilities with motivation leads to performance. If that is so, why does the same individual have fluctuations in his or her performance graph? Why do, employees with the same competencies or abilities, other factors being contestant, differ remarkably in their performance levels? One of the fundamental challenges being contestant faced by today's organizations is to sustain the motivational levels of their employees.

Performance is the accomplishment of a given task measured against preset known standards of accuracy, completeness, cost and speed. In a contract, performance is deemed to be the fulfillment of an obligation, in a manner that releases the performer from all liabilities under the contract.

Campbell (1990) defines individual work performance as "behaviors or actions of a staff member that are relevant to the goals of the organization." In simple terms, it is what the organizations hire one to do, and do well. What is commonly accepted is that organizations need and value staff members who perform well, and these high performers are considered a valuable asset and a cutting edge for the organization (yang, 2010; Aghast et al. 2011; Yule and Bektas, 2012).

An individual employee's performance consists of four dimensions – task performance, contextual performance, absence of counterproductive work behavior, and adoptive behavior. This task performance refers to actual quantity of work assigned, while contextual performance involves behaviors that support organizational, social and psychological environment. Adoptive behavior is about continuous learning to keep up with the changes, and counterproductive behavior is intentional or unintentional behavior that has the potential to work against the objectives of the organization.

EMPLOYEE ENGAGEMENT

Engagement is an indicator of an employee's willingness to expend discretionary effort to help the employer (Erickson, 2005). Employee engagement, also referred to as work engagement, worker engagement and job engagement, connotes high level of personal investment in and emotional connection with the work tasks performed in job (Kahn, 1990). It is different

from job attitudes. But, Robinson, Perryman, & Hayday, (2004) defines employee engagement as “a positive attitude held by the employee towards the organization to improve performance within the job for the benefit of the organization. An organization must work to develop and nurture engagement, which requires a two-way relationship between employer and employee.”

Khan (1990) who was the first to mention employee engagement referred to it as the “behaviors by which people bring in or out their personal selves during work role performance.” It is a near complete absorption of self into work role. According to him, engagement can be noticed at physical, cognitive and emotional levels. Rich et al (2010) defines it as a commonality among physical, emotional and cognitive energies that individuals bring to their work role.

Rothbard (2001) described engagement as consisting of two critical components: (1) attention, and (2) absorption; attention refers to cognitive availability and the amount of time one spends thinking about a role, and absorption refers to getting engrossed in one's role and intensity of one's focus on a role.

DEFINITIONS OF EMPLOYEE ENGAGEMENT:

The Hay group defines engaged performance as “a result that is achieved by stimulating employee's enthusiasm for their work and directing it toward organization success. This result can only be achieved when employers offer an implicit contract to their employees that elicit specific positive behaviors aligned with organization's goals...”

The definitions, as seen, focus on employer as well as the employee. Today's millennial workforce is more informed, connected, willing to work given learning opportunities. Personal growth, opportunities to learn and explore is becoming a primary driver. Equity more than pay is a driving force. Catering to the changing needs to foster engaged employees is the need of the hour.

DRIVERS OF EMPLOYEE ENGAGEMENT:

Job role

Employees must know the link between the organizational goal and an individual employee role. This helps in understanding the link between the two of them and thus increases the output of organization. Therefore it helps in motivating employees and contributes in creating organizational wealth.

Work environment

The relationship between an employee and organization is cemented when the employee and employer identifies their needs of each other. Therefore this helps in building supportive and motivating environment.

Rewards and recognitions

The main motive of an employee is to work and in the same time to fulfill his /her ambitions. A good reward for work done, must be praised for or receive recognition in the organization and society.

Learning and training opportunities

This is true in 21st century to constantly move ahead by enhancing knowledge and skill. It is important to provide a learning culture for an organization to remain firm in the constant changing of business world.

Performance management

A structured management system contributes to employee engagement. Setting goals is the main motive of management system and continuously working upon it.

Process of Employee Engagement:

Prepare and Design

The first step involved is discovering the specific requirements of your organization and deciding the priorities. After that a customized design of carrying the whole process can be designed. It is recommended to seek advice of expert management consultant in order to increase the chances of getting it done right at the first attempt.

Employee Engagement Survey

Frame the questions as per the requirements of the employee engagement survey and deploy it with the help of an appropriate media. It can be either in printed form or set online depending upon the comfort level of the employees and your questionnaire evaluation process.

Result Analysis

It is the most important step in the entire process. It is the time when reports are to be analyzed to find out what exactly motivates to perform their best and what actually disengaged them and finally compels them to leave the organization. The results and information can then be delivered through presentations.

Action Planning

How to turn the results of the survey into an action is a challenging question that organizations need to deal with the utmost care. Providing training to managers as well as HR professionals is very important in order to tell them how to take appropriate actions to engage employees. They should also be told about dos and don'ts so that they can successfully implement the changes.

Objectives

The objectives of the study are to:

- Find out whether there is significant relationship among the job performance, employee engagement, competency scale, willingness to help human beings and help the perpetuity of organizations.
- Know the Gender impact on job performance.
- Identify the impact of age on the willingness to help human beings.

Suggestions and Recommendations:

Supervisors and managers should meet at regular intervals with the employees in order to discuss regarding the improvement of the organization at the work place, to improve their standard of living, family problems etc.

The gap between the managers and employees should be reduced by raising the level of interaction.

Employees should feel that their ideas are being recognized and appreciated at times. It boosts the moral of the employees as well.

It creates healthy environment and good conduct among the managers and employees to increase the productivity.

Conclusion:

The commitment of the employees of the organization and their over and above performance otherwise called employee engagement, their sincerity, willingness attitude to help the other human beings and several other factors contribute to the overall atmosphere in the organizations which in turn results increases the organizational productivity. There is also further scope for the other factors to be taken for the research.

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USE OF ARTIFICIAL INTELLIGENCE IN THE INSURANCE SECTOR

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Abstract: Artificial intelligence as a wide scope has gained ground and is being used in every field of business, science and technology. Artificial intelligence is being introduced in the field of insurance. It is so because we are lacking in the area of innovation and are not able to satisfy customers. However things are changing, Artificial intelligence is now playing a major role in analysing customer satisfaction. For example in many cases the employee is busy, the customers had to wait until the claim request is granted by that employee. This outdated process makes the customers frustrated and the proceedings of the work are delayed. Hence Artificial intelligence can be of great assistance to improve the future claim requests. A new process called “touchless claim” does not require human intervention. This process uses Artificial intelligence in order to communicate with the customers and it is expected that a day will come when Artificial intelligence will rule the kingdom of claim and claim requests. The present study seeks to analyze the role of artificial intelligence in the insurance sector and also makes relevant suggestions to drive across the impact of artificial intelligence on the insurance sector.

Key Words: Artificial intelligence, insurance, claim.

Introduction

To solve complex problems knowledge is essential, collection of knowledge is considered as intelligence. Artificial Intelligence is a way of making a computer, a computer-controlled robot, or a software think intelligently, in the similar manner the intelligent humans think. Artificial intelligence works as human thinks. Human learn decide and work when they are solving the problem and uses the outcome of the problem as a basis for solving the problems. The outcomes help in developing intelligent software and systems. Artificial intelligence has received a great attention in recent years. Advancement in the technology and innovation has brought artificial intelligence closer to our lives. Industry investments in artificial intelligence is increasing, government is further trying to know how advancement in technology would improve lives of people. Expansion of Internet of things (IoT) has made a perfect environment for artificial intelligence to grow. Insurance industry is moving in a slow pace but certain evolutions are taking place. Insurers operating and business models are evolving, driven by trends such as use of “Use Artificial intelligence in the insurance sector” Insurance sector is thus greatly benefited from the recent advances like use of Artificial intelligence. This is having a significant potential to streamline insurer’s operation while enhancing customers experience.

Backgrounder

Insurance sector was working in a dull and monotonous way. Thanks to the technology that has helped us to sustain in the modern era. The risky process also can now be done easily. The automated techniques such as “Artificial intelligence” are one of the driving factors in today’s era.

Evolution

Artificial intelligence is embedding human intelligence into machines, and enabling the systems to learn, adapt and develop solution to the problem on their own.

Artificial technologies such as computer vision, robotics, machine learning and speech recognition, have substantially progressed over the years.

What is artificial intelligence

Artificial intelligence (AI) traditionally refers to an artificial creation of human-like intelligence that can learn reason, plan, perceive, or process natural language.

Artificial intelligence is further defined as “narrow AI” or “general AI”. Narrow AI, which we interact with today, is designed to perform specific tasks within a domain (e.g. language translation). General AI is hypothetical and not realm specific, but can learn and perform tasks anywhere.

Facets of artificial intelligence in insurance sector

Application of Artificial Intelligence in insurance industry will change the way companies carry their business. Machine Learning, Text Analytics and Natural Language Processing, Audio, Image and Video Analysis, Robotic Process Automation and Decision Management has an impact in the insurance field.

Machine learning

Humans learn things from there experience similarly machines learn algorithm by applying statistical techniques that helps to predict outcomes. Machine learning is the backbone of artificial intelligence implementation. Insurance companies source data from multiple sources latest technology Internet of things (IoT), drone data. Machine learning in the insurance industry is also useful in fraud detection, risk evaluation and identifying cross-selling opportunities.

Audio, image video analysis

Insurers can target faster and accurate claims processing to enhance customer satisfaction. Customers can initiate claims through a mobile app, click pictures of the accident and submit the claims instantly. Algorithms that have been trained through pictures from past claims can accurately estimate the extent of damage and automate the claims evaluation process.

Image and video analysis could also form a key application in commercial property insurance inspection. Agents generally upload pictures or videos of the properties as a part of their risk inspection report. Image and video analysis could analyze these supporting evidences and automatically evaluate the risk. This enables insurers to provide accurate rates to cover the risk.

Audio analysis or voice recognition has become a part of our daily lives. Identifying the tone and emotions is also part of the audio analysis. In the insurance industry, audio analysis has found its use in customer service and fraud detection.

Robot process automation(RPA)

Combination of artificial intelligence in the insurance sector is a new weapon in the technology arsenal. RPA provides an end-to-end automated solution for business problems. Insurance companies too are finding RPA to be a powerful tool and are reaping benefits. Automated underwriting and customer service are a great case study for RPA. For instance, customer requests for an address change through chat bots. Chat bots invoke robots that update the new address in the policy record.

Decision management

AI-power decision management system could be the digital sales advisor of the future. Based on conversations and data collected through bots, the next generation digital advisor can suggest products to the buyer. Digital advisors can also suggest the next best product to existing customers to increase cross-sell opportunities.

Aspects of Artificial intelligence**1. Claim management and fraud detection**

Claims management can be raised using artificial intelligence in different stages. By sway of artificial intelligence and handling massive amount of data in a short time, insurer can operate in a short time can automate the handling process. The algorithm can also reliably identify patterns in the data and help to recognize fraudulent claims in the process. Artificial intelligence may further be able to accuse the severity of damages and predict the repairs costs from the past data, sensors and images. Application include claim management where the process are automated would speed up the time and detect things which are invisible to human eye. Artificial intelligence is having potential to detect the fraud easily; more reliable which is invisible to human eye.

2. Marketing and customer experience.

One of the important parts of marketing is improving customer's experience. The cross-platform customer's usage data and statistics to learn detailed customer profiles to be able to offer personalized content and only relaxant product. This improves customer's satisfaction. It collects all of the customer's policies into one place and provides easy access to information.

3. Chat bots

The most used apps nowadays are messaging app which is direct and natural way to interest with the consumer. An intelligent customer service assistance which can be addressed to human like conversational interface. This is not only limited to customer care to ask there queries, resolve there complaints and claims. It can also offer tailored products and services by analysing customer's intentions.

Challenges

There are many factors that contribute towards the challenges faced due to use of artificial intelligence in the insurance sector.

Decision making

One of the important features of artificial intelligence is transparency and interpretability. With artificial intelligence performing task like managing insurance payouts, it is critical to understand decisions made by Artificial intelligence agent. But transparency is sometimes to limited things like state secrecy. It complicates this model because internal decisions and logic of machines is not always understandable.

Data quality and bias

Machine model algorithm will only be as good as the data it trains on commonly meaning "garbage in and garbage out". The biased data in the insurance sector will lead to biased decisions. The problem of minimizing bias becomes complicated in understanding and how a machine model solves the problem especially when vast amount of inputs are there. When customers feel the system is biased it leads to outcome of technology.

Safety and security

As the artificial intelligence agent learns and interacts with environment there are many challenges to be faced for the safe development. The safety is limited it all depends on how it learns from the environment.

Social and economic impact

It is predicted that artificial intelligence technology will bring a greater impact on the economy. Consumers are keen about greater efficiency and cheaper services. A sad part of it is current jobs will also be automated and India being a labour surplus economy it becomes difficult to adapt this model in the insurance sector as it leads to the problem of unemployment within the country.

Key drivers

Emerging scientific knowledge such as “Artificial intelligence” provides us a scope for intelligent automation. The huge volume of data generated requires intelligent automation for analysis. Property assessment and claim estimation can be done quickly and efficiently. “Artificial intelligence” reduces both time and cost.

Trend overview

With the rise of “Artificial intelligence” insurer started automating even the complex process. Few years ago people automated those things which required less decision making skills. Insurer are now exploring automation of property assessment, claim verification, customers interactions etc. Property and casualty insurer started automating property assessment and claim processing. Aerial digital images are captured for property assessment. Personalized computer interaction resolve customer’s queries with man and machine interaction. In the growing world where customers date is increasing in a fast pace for which large volume of data is to be generated. This job becomes easy with the help of “Artificial intelligence”. “Artificial intelligence” can also be used in fraud detection, as data from greater number of sources can be used for analysis.

Implication

A wide range of back-office functions such as policy acquisition, policy servicing claims can be automated allowing the firm to look after front- office services. Customers experience is enhanced with quicker, transparent, and error-free transactions. Artificial intelligence can provide with more advancement and lower cost of operations but what is very important is firms need to standardize data across the value of chain for smooth and efficient use of artificial intelligence.

CONCLUSION

AI is playing major role in analyzing customer satisfaction. Application of AI in insurance sector will change the way the company carry their business. Insurers can fast-track claims, reducing the time and cost of processing while enhancing customer experience through artificial intelligence. We should face challenges like decision making, safety and security etc. Finally, a lot of approaches have been proven to be successful in solving problems of great interest such as pricing, claim handling, and fraud detection among others.

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INSURTECH: AN INNOVATION IN INSURANCE

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Abstract: India is a flexible country and has been adapting itself to all kinds of changes in all sectors till date and will surely continue to incorporate the new changes that are to be introduced in the coming days. This indicates that the world is facing new changes every new day. In order to keep pace with the modern world, every country has to accept the new changes. One of these changes is introduction of latest technology in every field. Right from a small scale industry to a large scale industry adapts the latest technology. Technology is not only being adapted in manufacturing sector but also in the service sector. In fact, the use of technology in the service sector is more than its use in the manufacturing sector. The service sector comprises of hospitals, educational institutions, IT, insurance etc. This article focuses on the introduction of latest technology in insurance which is given by the term "INSURTECH" i.e insurance and technology

Key Words: Insurtech, insurance, technology, devices

Introduction

Insurance has become a prominent industry in the service sector. No one can predict the future. There can be good or bad. Every human being expects good, when there is something bad we wish it to become good. This is what an insurance industry does; it minimizes the risk in future. It cannot be said that it completely covers the risk but it can cover the major part of risk, just as 'a bird in hand is better than two in bush'.

The insurance company charges a certain amount for covering the loss, which is called as premium. The premium is determined on the basis of risk involved i.e it is depends upon the policy taken by the customer. For example, if a customer takes a life insurance policy, the premium is charged on the basis of customer's age, health, occupation, life style etc. These factors determine the rate of premium i.e it can be higher or lower. In order to charge the premium in the best possible way a new technology is trending in insurance industry which is 'INSURTECH'.

Insurtech the future of India- A possibility

Right from the time we wake up to the time we sleep, technology plays an important role in our lives. With the help of technology the world is in our hands. If we want to do shopping, we can do it online. We can buy clothes, vegetables, grocery, furniture etc. through online. But when it comes to policies like insurance policy, we directly go to the insurance company and enquire about it or we consult an insurance advisor. This is because we take utmost care regarding purchasing a policy, about the premium, its other benefits etc. Insurance plays an important role in a business environment as the conditions of a business are uncertain. Since the business conditions of a country contribute to its growth, it is necessary to reduce its risks. A businessman may not be able to find time to visit a insurance company or consult an insurance advisor in his busy schedule. Insurtech helps the businessman to find a suitable policy which he needs through online from anywhere which is time saving.

Insurtech in brief uses technology for predicting risks i.e. by using various tech devices such as GPS tracking of cars, apps in smart phones etc. to price premiums accordingly, having easy access to insurance policies which are different from traditional insurance practices. In the traditional practices, insurers have to analyse the risk by using various methods, tools, etc. which are rigid and time consuming and yet the results are not accurate. Whereas the use of technology can give the appropriate results. For example, if a person has taken travel insurance, the risk can be analyzed by using tracking devices which is not possible in traditional insurance industry.

Need for Insurtech

As innovation is key to growth of a business, every business has to accept the changes. Insurtech leads to multidimensional expansion of the insurance industry. As a result insurance industry can provide best possible results. There are many insurtech start up companies across the world. US holds a large number of insurtech companies while in other countries like India, the insurtech companies are slowly making its presence felt. A sum of 4.5 trillion dollar insurance industry has been affected by 101 insurtech startups from various countries like America, India etc. The advantages of these insurtech companies is that they can provide employment to many youngsters as the youngsters are the major users of technology. As the insurtech start ups are now being considered as small scale industries, it might give boost to other small scale industries that even they can revolutionize their respective industries just as the insurtech is doing. In a country like India which is slowly being transformed into a digital economy, there is a great scope and need for these startups.

In the modern world major proportion of the population is becoming tech friendly. Therefore, these startups will lead to a greater customer satisfaction. These start ups also require less paper work and the cost of infrastructure etc. are also less. These start ups can play an important role in the development of developing countries.

Challenges

The first and foremost challenge that insurtech start ups are facing is 'reluctance to change'. The big giant insurance industries are reluctant to adopt the latest technology as it involves many regulations, especially in a country like India. The insurance industries are facing difficulties in complying with the regulations that are posed by the governments for insurtech startups. The availability of funds is another challenge. As these startups are being started by the new technology programmers they may not have enough capital. The fear of losses in big insurance industries is one of the reasons why the start ups are not being easily accepted.

Suggestions and Conclusions

The adaption of technology is very important for every person in the modern world. Without the adaption of technology we cannot fathom life to be, just as we cannot imagine our lives, in today's world without a smart phone, a transport vehicle, and computers etc. which are possible just because of technology. In the future, it is assumed that Insurtechs may replace the insurance industry, without which we may not imagine our lives. This will be possible only when we adapt and adopt to the latest technology i.e. the giant insurance industries should welcome the new start ups and the governments should encourage them. Governments should provide support to these startups by various schemes in countries like India, which are developing, as these startups can give a boost to the development of the country.

'Survival of the fittest', will be the pathway to success for any insurance company wanting to compete with others. Change is imminent and adopting the change will be the mandate for survival. Otherwise companies who do not adapt to the changing environment will survive and the rest will die just as the Giraffe has grown its neck to adapt itself to the changing environment. Similarly, the insurance industries have to adopt the new inventions like insurtech which will revolutionize the industry.

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MARINE INSURANCE- EMERGING TRENDS IN MARINE INSURANCE AND RISKS INVOLVED IN MARINE INSURANCE AND MARINE PERILS

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Abstract: Risk management is considered as an important aspect in management activities. Every manager has to be careful about the different kinds of losses that have the most probability to occur. The losses may be in the form of fire, theft, loss of cargo during transportation, risk of creditors and so on. Insurance is considered as a means of protection from the financial losses. Financing the risk is considered as a thoughtful decision. In this paper, a detail about marine insurance is discussed. Marine insurance is considered as mother of all insurances. It is a form of non-life insurance. The object is to indemnify the insured against losses incident to marine adventure.

What is marine insurance?

Marine insurance covers the losses and damages caused to ships, terminals and any transport or cargo by which goods are transferred, acquired or held between different points of origin and final destination. marine insurance is haven for transporters and shipping corporations because it helps to lower the aspect of financial loss due to cargo loss.

In India the marine insurance is regulated by:

The Indian maritime insurance act, 1963

Which is based on original marine insurance act, 1906 UK

There is no international law regulating the marine insurance which doesn't encourage the corporations to deal with this.

INTRODUCTION

MARINE INSURANCE

LLYODS COFFEE HOUSE

In the 17th century, London's importance as a trade centre lead to increasing demand for ship and cargo insurance. LLOYDS coffee house was established by EDWARD LLOYD. This coffee house has been recognised as a place for obtaining marine insurance. Over the past 325 years Lloyds has become the world's leading market for specialist insurance. It has become the biggest marine insurance market. This coffee house eventually became meeting point for brokers, insurers and ship owners for negotiating their business where they would discuss various aspects of shipping business including cargo and ship insurance and ultimately started transacting marine insurance in a big way. This also provided an insurance cover of around one million\$ to TITANIC which sank in 1912.

The marine insurance now-a-days is much more than what was envisaged earlier, it is required to protect the interest of various parties like owner of the ship. Owner of the cargo, person interested in freight, and so on.

CLASSIFICATION OF MARINE INSURANCE

- 1.Hull insurance: Insurance of vessel with its gear.
- 2.Cargo insurance: Insurance of goods carried by sea.
- 3 .Freight insurance.
- 4 .Liability insurance.

However, this paper only deals with cargo insurance.

CARGO refers to goods and commodities carried during transit by rail, road, sea or air from one place to the other. The cargo transported by sea is subjected to risk such as loss or damage at port, loss or damage during in the voyage either by theft or natural calamities.MARINE CARGO INSURANCE covers export and import shipments by sea, transshipments and inland transfer of goods and so on.

MARINE ADVENTURE OR MARINE PERILS

Perils of the sea in marine insurance include extraordinary forces of nature which maritime ventures need to face during voyage. even if we talk about natural perils it will not include the natural and ordinary action of wind. Some of the examples are collision, sinking, heavy wave action and heavy winds.

Perils of sea in marine insurance comprises of losses only to goods which are on board that happens due to irresistible forces of nature or human activities. Marine insurance does not provide insurance to all the perils. There are insured and non-insured perils.

INSURED PERILS: Some of the insured perils include,

Fire explosion, breakage, accident, theft, non-delivery, jettison, collision of one ship with another ship, burning and sinking of ship, spoilage of water from sea water, wilful destruction of ship by captain of the ship or the crew and so on.

UNINSURED PERILS: Some of the uninsured perils are,

Ordinary leakage, ordinary loss in volume or weights or ordinary wear and tear of the subject matter insured, loss or damage caused by no proper packing, damages caused without the intervention of any external cause, loss, damage or expense arising out from the weapon or war employing.

TYPES OF MARINE POLICY

Marine policy is of different types based on the area of the execution.

1. Voyage policy
2. Mixed policy
3. Time policy
4. Valued policy
5. Unvalued policy
6. Open policy

THE LEGAL REGIMES OF MARINE INSURANCE

The term legal regime is used to refer collectively to all the rules and procedures that affect the contractual relationship of the marine insure and assured. It includes policies, conditions and legislative provisions as well as supplementary influences such as judicial decisions and market practices.

NATIONAL POLICIES USED IN MARINE INSURANCE

At the current there are no international uniform policy conditions as such for marine insurance. Thus, varied policy forms produced by numerous national marine insurance markets are used, such as the Lloyd's S.G. form, the institute clauses produced by the institute of London underwriters, the general conditions of hull insurance produced by Japanese hull insurers union, the general conditions for cargo insurance approved by the association of Mexican insurers and so on.

However, despite the variety of national marine policy conditions issued by various countries around the world, 'British conditions' has become widespread that the policy forms are virtually treated as defacto international insurance conditions. About two thirds of the countries in the world utilizing hull insurance or cargo insurance use British conditions solely, or as an alternative to, or in conjunction with the local policies. Few countries use British conditions for export trade and local policies for their import trade. The local policy may range between being a (a) replica to the British conditions, (b) a policy that is local in many respects but incorporates few clauses of British conditions, (c) local policy to which the practice permits to attachment of British clauses, (d) truly local policy. On the other hand, developed market-economy countries whose legal system is in the civil law tradition are relatively more likely to have a separate local policy which differs from British conditions.

Among the reasons why British conditions continue to be so widely used, despite the absence of any obligation to use them, appears to be

the historical economic predominance of the British market in terms of insurance placements on both reinsurance and direct basis, particularly from developing countries. Insurance policies written subject to British conditions are considered easier to reinsure, co-insure and more, will be readily accepted by foreign assureds. The international law association developed in 1901 what were known as Glasgow Marine Insurance Rules. These were designed to regulate the marine insurance cover.

SUGGESTED RECOMMENDATIONS

1. There should be the international law which properly regulates and take due considerations regarding the marine insurance.
2. Consideration should be given to the drafting of a temporary payment clause for situations where two or more insurers are in dispute as who is liable for loss.
3. The insured and uninsured aspects of the claim are to be properly mentioned in the clause.
4. Local laws followed by few countries are to be taken into consideration while transporting goods.

EMERGING RISKS OF MARINE INDUSTRY

LARGER VESSELS: In this world of innovation, most of them are preferring larger vessels, that they bring the whole set of exposures, like the wake damage they can create if they are maneuvered incorrectly.

CYBER: This is big concern for more modern vessels that use computerized equipment, people who want to do harm can hack into the systems and create havoc with the navigation and communication systems.

CLIMATE CHANGE: As weather events become severe, the Impact on terminals, ships and other marine territories could be staggering.

OIL SPILLS: The transportation of crude oil or other gas and petrol substances if subject to any accident may result in spill of oil on the layers of the sea which contributes to pollution.

AQUACULTURE: Due to oil spills and fans of the large vessels may result in increased death of many aquatic and rear species of fishes. This may result in loosing of livelihood of population who depends on aquaculture.

CONCLUSION: Marine insurance is considered as a most important forms of insurance sector and it is also treated as booming and trending industry in current scenario as most of the exports and imports are carried out through the waterways. This industry also contributes to the large employment opportunities across the world. Marine insurance reduces the burden on the interested parties of the cargo.

Consequently, the international conduct of marine insurance is subject to new pressures not yet experienced. The emergence of marine insurance ha created a demand for legal regimes understandable and adaptable to local assureds and insurers. It also created for the international harmonization of the various marine insurance legal regimes.

The future of marine insurance is undoubtedly a boom in the economic aspect. It may result in the development of wide variety aspects of transportation. Marine insurance helps in the risk management of the companies.

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CONCEPT OF AGILE RETAILING

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Abstract: Present business environment has an evolutionary transformation with change as main characteristic. Transformation is happening in every industry in terms of adopting technology, methods, processes, strategies what not almost in every functional areas. All these are done to meet customer demands. In today's environment customer preferences are changing very fast and frequently. So, whoever can catch the eyes of the customer, they will be successful in the market. This competition is more in retailing especially in fashion industry comparing to others. Few decades back, retailing was innovative way to reach the customer directly by reducing the supply chain length. After that, e-commerce had played an amazing role in business industry. Now, the markets have transformed the total retailing into the app world. In the track of reaching the competition, the retailers have come up with the new concept called "Agile retailing". The industry that's emerging as a sequel to fast fashion is being termed as Agile Retail, a reference to its responsive supply chain, e-commerce sales approach and reliance on big data for trend forecasting. Taken together, these traits make the industry more than fast, they make Agile.

Key Words: Agile Retailing, supply chain, lean manufacturing and Agile manufacturing

Introduction: Every business organization wants to serve their customers in a better way because of the increasing competition all business organisations are trying to bring out something new to gain competitive advantage. So, in this race retailers are trying to implement the concept of Agile in their industry. The word "Agile" means able to move quickly & easily. Agile retailing is all about serving your customers better by aligning to their changing needs around how they engage & buy from you. Agile retailing reduces the no of intermediaries between seller and buyer. Large data

is used to estimate styles and manage process of production, not that all it is easy fast and convenient. The internet has changed everything. Google is increasingly influencing the retail supply

chain. Retailers try to provide unique and differentiated experience to customers (from the time of order fulfilment, until the time of receiving of the product).

Literature review

Lean or agile A solution for supply chain management

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Abstract-1

The textiles and apparel industry has been neglected in terms of supply chain management research. Recently, the industry has undergone a great deal of change, particularly with global sourcing and high levels of price competition. In addition, textiles and clothing has market characteristics, such as short product lifecycle, high volatility, low predictability, and a high level of impulse purchase, making such issues as quick response of paramount importance. This article explains the features of clothing, apparel industry and also the point of view of lean and agile concepts while reducing the lead time. Various approaches to SCM are illustrated through case studies.

Change in textiles: Agile Retail disturbs fashion Industry.

Abstract-2

A new industry, one that CEO Roman Kirsch calls "Agile Retail," is capitalizing on many of the principles that have made other stalwart tech companies successful in their respective industries. Agile Retail, competes with well known clothing stores, agile retailing reduces the no of intermediaries between seller and buyer. Large data is used to estimate styles and manage process of production, not that all it is easy fast and convenient.

In the mid 21st century, many companies came into the picture proclaiming themselves "fast fashion" companies, with low price and best quality. Every year they produce 10,000 to 15,000 new styles and sell them at their hundreds of locations around the world. Zara's founder Amancio Ortega is now the richest man in Europe with an estimated wealth of more than \$70 billion.

Evolution of Agile Retailing:

The idea evolved from the concept of JIT & lean manufacturing . Lean manufacturing focuses on eliminating waste in the manufacturing process. Initially, the Agile retail was applied only to automobile industry. The German based online retailers Lesara has been using the concept of Agile retail in the fashion industry.

Processes of Agile Retailing:

Agile manufacturing is proposed in response to the circumstances as a solution and is perceived as a vital characteristic that manufacturing companies need to have in order to maintain their competitive advantages in the new order of world business.

Constantly meeting unlimited expectations may increase the costs. The question is when to offer and for whom, what is the best delivery offer from a marketing perspective? What will it cost? What are the options available? To get answers to these questions, marketing and supply chain management need to discuss and must be able to collect required data.

Big data, which can be pulled from search engines, social media and in-house data sources, is at the core of Agile retail companies. Used properly this data, empowers them to do more than react to trends and to predict trends.

Agile retail is a direct – to – consumer retail model that uses big data to try to predict trends, manage efficient production cycles and faster turnaround on emerging styles. Agile retail applies the concepts from Agile and lean manufacturing in the retail business and aims to respond faster to consumer needs. Lean manufacturing objective is to maximize efficiency during manufacturing with a view to enhance productivity and lower costs.

The concept turns e-commerce retailers into on demand platforms that identify stock and deliver desired product directly to the consumer, thereby reducing costs. The main focus of Agile retailers is to identify trends that are popular with consumer at a given moment and deliver those products using Agile production concepts.

Agile Manufacturing:

Agility is the capacity to change the ideology according to the changing conditions or flexibility in the methods according to the rapid changing environment. Agile manufacturing is defined as a flexible manufacturing method which is being used to produce goods and services in order to meet the changing customer's needs and expectations quickly and effectively. The change in manufacturing system from mass production to Agile manufacturing is due to following reasons.

- Increase in competition across the world
- Market fragmentation
- Increased cooperation among the companies
- Growing needs and expectations of customers
- Reduction in product life cycle time, lead time and development time
- Increased focus on customers.

Advantages of Agile Retailing:

- Using big data to figure out faster what the consumer wants.
- Ability to respond to changing needs faster than traditional retail.
- Aim to customize shopper's demands.
- More efficient supply chain, reducing waste.

Conclusion: Time will tell if we will see a showdown between Agile Retail. We've seen retail giants being taken down by newer and more convenient web-based businesses. Not long ago, hundreds of Target locations opened in Canada, only to close down soon after. The reason? People don't need more brick-and-mortar retail businesses that offer them the same products they already have access to. People want a more personalized experience. They want their needs to be responded to faster and earlier. It's long overdue, but the future of retail is happening quickly. Soon the products we desire and need will be available to us before we even realize what it is we want.

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IDENTIFYING THE DETERMINANTS OF ONLINE RETAIL PATRONAGE: REVIEWS AND RATING PERSPECTIVE

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Abstract : Internet has made a drastic difference in our lives. The change has brought a major transformational power over many enterprises, businesses and economies. Millions of internet users access internet for various purposes. The usage of internet is done for surfing, browsing, socializing, communication, information gathering, publishing copying, printing, tracking locations, trading and selling etc. The literature has examined the determinants of retail patronage from various perspectives. However, its online counterpart has received less attention. This study adapts reviews and rating perspective to identify the antecedents and subsequent online retail patronage. In addition the contextual role of security concern and return policy is also examined. Data were collected from online shoppers, and PLS SEM (Partial Least Squares Structural Equation Modeling) was used for analysis. The results indicate that product quality is positively associated with reviews and ratings and remaining all other constructs like product assortment, price transparency, and website convenience were negatively associated with reviews and ratings. In addition, security concerns, return policy negatively moderate the relationship between reviews and ratings and online retail patronage.

Key Words: Online retail Patronage, Reviews and Ratings, Security concerns, PLS SEM

Introduction

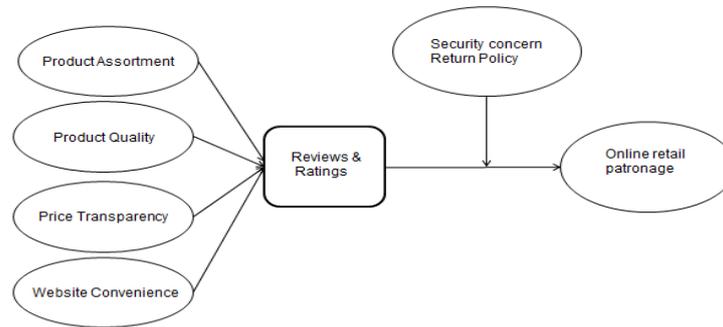
Electronic commerce (ecommerce) is a business model type that allows a firm in conducting business over electronic network i.e. Internet. It operates in all the four market segments: business to business, business to consumer, consumer to consumer and consumer to business. It can be thought of as a more advanced form of mail-order purchasing through a record. Ecommerce offers many products and services, from books to music, from clothing to furniture, from financial services to online services.

E-retailing: Electronic retailing (e-tailing) is a buzzword for any business-to-consumer (B2C) transactions that take place over the Internet. One of the main changes in modern consumer behaviour has been the transition from a passive to an active and informed consumer. Internet enables customers to share their opinions on, and experiences with, goods and services with a multitude of other consumers. Online consumer reviews are used by prospective buyers of related products who are interested in obtaining more information from people who have purchased and used a product of interest. Word-of-mouth (WOM) is one of the most important information sources when a consumer is making a purchase decision as it is also a new trend of marketing. The arrival and expansion of the Internet has extended consumers' options for gathering product information by including other consumers' comments, posted on the Internet, and has provided consumers opportunities to offer their own consumption-related advice by engaging in electronic word-of-mouth (eWOM). eWOM can be defined as all informal communications directed at consumers through Internet-based technology related to the usage or characteristics of particular goods and services, or their sellers.

Online Reviews and Ratings: Nowadays, more and more e-commerce platforms offer product reviews or product ratings. In literature, the terms review and rating are often used interchangeably, but for our work it is important to distinguish these two terms. A product review is a textual representation of a customer, who describes the characteristics (e.g. advantages and disadvantages) of a product. A product rating on the other hand represents the customer's opinion on a specified scale. A popular rating scheme in online shops is the star-rating, where more stars indicate better ratings. Product reviews and ratings are generated by the user (i.e. the customer of an online shop) and published on the website of the retailer. Product reviews and ratings are popular tools to support buying decisions of consumers. These tools are also valuable for online retailers, who use rating systems in order to build trust and reputation in the online market. Many online shops provide quantitative ratings, textual reviews or a combination of both. The number of online consumers who read and trust online reviews is increasing. According to a survey by BrightLocal, 88 per cent of consumers trust online reviews as much as a personal recommendation, considering most online reviews are posted by total strangers. The same survey found that only 12 per cent of the population did not regularly read reviews for consumer products. Online review systems are a valuable information channel for consumers to assess the quality of products and services prior to making purchase decisions, particularly for high involvement products. Online consumer ratings are an evaluative, numerical form of eWOM that reduces the information asymmetry for current and potential customers on the Internet and is thus expected to impact sales. Because of this, several studies have investigated their effect on demand since it is still not clear the extent to which their valence, volume and/or dispersion affect product sales. Research that attempts to identify how to design a useful online review system for consumers is limited. Online review systems are viewed as a key source of electronic word of mouth (eWOM) and comprise different components such as rating score, textual areas, usefulness indicators, and other unique components. Designing an effective online review system requires an understanding of how consumers' reactions to the system can change in their beliefs and behaviour. Consumers may react to review contents, to reviewers' credibility, and review ratings. Various online review

system components are designed toward honestly and accurately conveying other consumers' opinions and experiences to potential and future customers. Understanding how online customers are affected by exposure to online review system components helps to predict their reactions to user-generated content (UGC).

Figure: Conceptual Framework



Review of Literature

Markus et al (2016) have studied the reviewer's heuristic evaluations and its effect on online star rating that can lead to suboptimal purchase decisions. It was found that presenting an attribute rating before providing rating had a significant positive effect on the overall ratings.

Georgios et al (2016) found that the verified customers submit up to 0.5 star higher ratings than self-motivated web reviewers. It also explains how the combined findings can help ways to ease various preferences that direct online review submissions and help practitioners provide more reliable, descriptive and higher ratings to their customers. Online retailers must also make decisions about how they display the reviews to their users. The retailer should provide accurate and reliable representation of the true quality of the reviewed product.

Abdulaziz et al (2016) have studied about the influence of online customer review on customer's purchase intention. A research model was introduced called Perceived Derived Attributes (PDA) that says about the issues of perceived derived attributes of online reviews. The perceived usefulness of online customer rating has a significant direct influence on consumer purchase intention.

Robert et al (2016) have studied about Follow-up research that should highlight the variety of consumers and the diversity of their needs. Increased interaction and exchange of ideas between researchers of all disciplinary fields working in such area will certainly be healthy for the constant growth and development of this growing area of investigation.

Ewa Masłowska et al (2016) have studied about the impact of review valence and volume on actual sales. The data is collected from three websites and six weeks of sales data is taken. It is found that the nonlinear effect of valence (i.e., average stars) is insignificant for all four product categories. Price and Brand forms an important factor that can influence the buying decision of consumers. Customers prefer to buy the products that are rated with higher star than the products rated with average ratings.

Ramgopal et al (2016) have studied about the usefulness of the online reviews seeing both quantitative and qualitative factors. Set of 1500 reviews were randomly collected from TripAdvisor.com from multiple hotels. The results shows review type considerably influences the effect of review length than helpfulness and comparative reviews tend to be more helpful.

Jing Yang & Rathindra Sarathy (2016) have examined the effect of social consensus in product reviews represented by review balance and volume on online shoppers risk perception, uncertainty, attitude, subsequent purchase intention using a quasi-experimental design and online questionnaire. Result of the study shows that the review balance has a significantly effect on the purchase intention but is moderated significantly by review volume.

Michael et al (2016) has studied about the online consumer reviews on the demand in restaurant. Regression discontinuity approach was taken to support the hypothesis i.e. yelp.com has a causal impact on the restaurant revenue. It was found that the one-star increase in the yelp rating lead to 5-9% increase in revenue for restaurant.

Kevin et al (2015) have examined about the effects of review arousal on perceived helpfulness of online reviews on consumer emotional responses elicited by review. The results showed that the arousing reviews are perceived to be more helpful than the non-arousing reviews. High arousal emotions expressed by reviews do not always trigger similar emotions in consumer reading the review.

Zan Mo et al (2015) about the effect of online reviews on consumer purchase behaviour. It shows that the positive reviews, de-scribing rating, picture reviews, appended reviews and cumulative reviews have an effect on consumer purchase behavior. The moderate reviews, negative reviews, logistics rating and service rating are not significant in the results.

RahatUllah et al (2015)it is found that there is a difference in the emotional content of reviews between search and experience goods in the early stages of product launch.An empirical study is conducted using online customer reviews i.e. 15,849 from online retailing giant Amazon.com. Consumers are more likely to engage in interpersonal communication when they have very positive/satisfactory or very negative/dissatisfactory experiences.

Georg et al (2013)have examined about the acceptance and usage of ratings and reviews in context of online transactions by taking the examples of shopping websites like Amazon and eBay that contains user generated reviews. Product reviews are an important source of information for customers to support their buying decision. Current rating systems have their weaknesses, especially when it comes to the task of comparing different product re- views with each other.

Vimaladevi&Dhanabhakaym (2012) have studied the impact of one type of electronic word of mouth on purchase decisions of electronic products at Tamilnadu. It was found that number of reviews has significant effect on the buyer purchasing decision due to perceived popularity of the product.

Jianxinget al (2012)have identified the product aspects and consumer opinion on these aspects. Frequency based method, Correlation based method, hybrid methods are used to compare and rank the product aspects. The consumer opinion on the important aspects and frequent comments on these will influence their overall opinion of the product.

Yayliand&Bayram(2009)have assessed the impact of, one type of electronic word-of-mouth (eWOM), the online consumer review, on purchasing decision of electronic products. Many conclusions have been drawn from the findings i.e. that buyers' perception has a positive relationship with reviews' characteristics. The result of the research has revealed that there were significant main effects of the reading reviews before purchasing and buyers' purchase frequency.

Steve &Leigh (2003) have studied about the impact of e-commerce process and procedures on the retail process or structure. The approach taken here is to review the literature and published evidence for trends and tendencies and to comment on the probable directions of change. It was found that the there is a great deal of uncertainty and range of conflicting views over the future of e-commerce.

Detloret et al (2003)have investigated about the consumer preferences for Web-based product information display across browsing and searching tasks. Several information items that were relevant in both the browse and search tasks: pricing, product description, retailer selection, and retailer advice. This suggests that online retailers need to present these particular information items on the computer interface in ways that are highly visible and easily accessible for consumers.

Chaterjee et al (2001) has studied about the how the consumers use the online reviews and how these influence on evaluations, purchase intentions of consumer. Online e-wom is considered in the form of retailer reviews provided by comparison shopping engines. It was found that the choice driver's responses for most important reason for choosing a retailer were based on familiarity and price related factors. The impact of negative consumer reviews on perceived reliability of retailer and purchase intention is mitigated by consumer familiarity with the retailer.

Research Objectives

- To know the customer perception of product quality and product assortmentsbased on reviews and ratings for Amazon.com retailer.
- To understand the customer perception of security concern and price transparency based on review and ratings for Amazon.com retailer
- To know the customer perception of website convenience based on review and rating for Amazon.com retailer

Research Methodology

Methodology Elements	Methodology Description
Research Type	Descriptive study
Location	Hyderabad
Sample size determination	Glenn sample size table (1992)
Sample size	150
Source of data	Primary sources & Secondary sources
Sample selection technique	Convenient sample (Non-probabilistic)
Data collection technique	Structured questionnaire
Measuring scale	Likert 5-point rating scale
Data analysis technique	Descriptive statistics, Reliability tests, Cronbach's Alpha, (SPSS 22 Version), PLS SEM (SMART PLS 3 Version)

Hypothesis

H1: Online customer's perceptions of product assortment will be positively associated with perception of reviews and ratings

H2: Online customer's perceptions of product quality will be positively associated with perception of reviews and ratings

H3: Online customer's perceptions of price transparency will be positively associated with perception of reviews and ratings

H4: Online customer's perceptions of website convenience will be positively associated with perception of reviews and ratings

H5: Online customer's perceptions on reviews and ratings will be positively associated with online retail patronage.

H6: Customers security concerns will weaken the relationship between reviews and ratings and online retail patronage.

H7: Customers return policy will weaken the relationship between reviews and ratings and online retail patronage.

Results and Discussions

Table: Descriptive Statistics of Demographic Factors

Gender	Frequency	Percent	Valid percent	Cumulative percent
Female	55	51.4	51.4	51.4
Male	52	48.6	48.6	100
Total	107	100	100	
Age	Frequency	Percent	Valid percent	Cumulative percent
Below 20 Yrs	7	6.5	6.5	6.5
21 - 30 Yrs	75	70.1	70.1	76.6
31 - 40 Yrs	16	15	15	91.6
41 - 50 Yrs	6	5.6	5.6	97.2
51 & Above	3	2.8	2.8	100
Total	107	100	100	

Education	Frequency	Percent	Valid percent	Cumulative percent
10th Standard	3	2.8	2.8	2.8
Intermediate	7	6.5	6.5	9.3
Graduate	42	39.3	39.3	48.6
Postgraduate	49	45.8	45.8	94.4
Ph.D	5	4.7	4.7	99.1
Others	1	0.9	0.9	100
Total	107	100	100	
Occupation	Frequency	Percent	Valid percent	Cumulative percent
Self Employed	8	7.5	7.5	7.5
Employed	61	57	57	64.5
Professional	10	9.3	9.3	73.8
Student	18	16.8	16.8	90.7
Retired	3	2.8	2.8	93.5
Others	7	6.5	6.5	100
Total	107	100	100	

Monthly Income	Frequency	Percent	Valid percent	Cumulative percent
Less than Rs. 10,000	11	10.3	10.3	10.3
Rs. 10,001 - 20,000	51	47.7	47.7	57.9
Rs. 20,001 - 30,000	17	15.9	15.9	73.8
Rs. 30,001 - 40,000	16	15	15	88.8
Rs. 41,000 - 50,000	3	2.8	2.8	91.6
Rs. 50,001 and Above	9	8.4	8.4	100
Total	107	100	100	

Respondents include both male & female who does online shopping from Amazon and are Amazon customers. The most popular age group people who are more interested in online shopping are in the range of 21-30 years. The majority of respondents include many graduates and post graduate students, employees. The monthly expenditure on online shopping from Amazon for the patronage customers lies below Rs.10, 000.00

Table: Descriptive Statistics of Items

How often do you have online shopping from Amazon?	Frequency	Percent	Valid percent	Cumulative percent
Twice a week or Above	3	2.8	2.8	2.8
Weekly	3	2.8	2.8	5.6
Once per two weeks	6	5.6	5.6	11.2
Monthly	26	24.3	24.3	35.5
Occasionally	51	47.7	47.7	83.2
During big sales	18	16.8	16.8	100
Total	107	100	100	

How much do you usually spend on online shopping per month?	Frequency	Percent	Valid Percent	Cumulative Percent
Below Rs. 10,000	74	69.2	69.2	69.2
Rs. 10,001 - 20,000	27	25.2	25.2	94.4
Rs. 20,001 - 30,000	3	2.8	2.8	97.2
Rs. 30,001 - 40,000	3	2.8	2.8	100
Total	107	100	100	
What products do you usually purchase from Amazon?	Frequency	Percent	Valid percent	Cumulative percent
Electronics & Computers	34	31.8	31.8	31.8
Books & Audible	4	3.7	3.7	35.5
Clothing, Shoes & Jewellery	52	48.6	48.6	84.1
Sports & Outdoors	4	3.7	3.7	87.9
Beauty, Health & Food	7	6.5	6.5	94.4
Home, Garden & Tools	4	3.7	3.7	98.1
Toys, Kids & Beauty	2	1.9	1.9	100
Total	107	100	100	

Many people do online shopping from Amazon occasionally during seasonal offers like Great Indian sale for products like electronic gadgets, apparels, furniture and home needs. Also, few people prefer buying products from Amazon on a monthly basis for basic products related to Health care, Food, Beauty care, etc. Major selling product categories were Clothing, shoes & jewellery, and Electronics & computers.

PLS Sem Model:

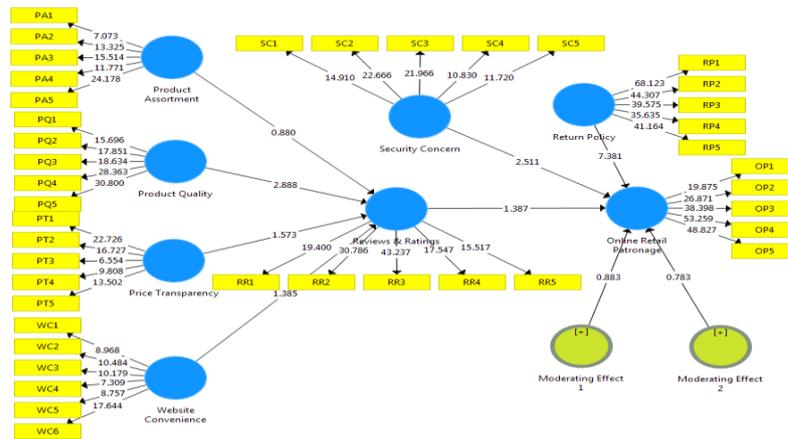


Figure : PLS-SEM

Constructs

Constructs are the building block of theories that help in the quantitative research to explain the behaviour of certain phenomenon. Constructs are used to express or define some variable, abstract, event, or any object/thing. These constructs helps one to provide a common language and meaning to communicate about things in a more precise manner. In this study, the following constructs explains about the online retail patronage in terms of how these constructs may influence the customer loyalty.

Product Assortment:Product Assortment refers to the different types of products retailer provides for sale that can be broadly categorized in terms of Breadth, Length, Depth, and Consistency of Products.

Amazon provides product assortment which includes wide variety and types of products for sale which ranges from Clothing, Electronics & appliances, Home & Kitchen, Beauty & health, Books & EBooks and much more. Along with maintaining a variety of products, Amazon also manages to categorize and align the different types of products into various sections.

The product assortment is one of the reasons for Amazon to be known as one shop for all needs.

Product Quality:In business meaning, Product quality refers to the perception of the degree to which the customer’s expectation is met. In e-commerce retailing, product quality is measured in terms of the customer satisfaction. Amazon maintains to be on the top of all online shopping e-commerce in providing products of best quality. The quality is measured by the reviews and ratings given by the customer on the online website. Quality of a product also involves service provided to the customer including packaging of products, product performance, value to the customer, etc.

Price transparency:Price transparency related to e-commerce means the customer has the complete knowledge on the selling price of the products from different brands and different e-commerce.

Amazon provides customer to look at the products from different brands and compare their prices. It helps the customer in providing transparency in price of the product. The customer can differentiate in between products from different brands in terms of price, benefits, quality, etc. Amazon offers its products for sale like deals for the day and Amazon Great Indian Sale that allows customer to purchase products at a lesser price.

Website convenience:Website convenience tells about whether the website is user friendly or not. The online shopping website should help customer to navigate easily to the page they require. It includes usage of links, languages, alignment, display, etc. of the items on the page. In Amazon, the shopping website includes basics items like Cart, Profile, shop by categories, and Deals of the day to be shown in the first page and easily accessible to its customers.

Reviews & Ratings:Reviews and ratings in the online website refer to the comments provided by the customers who have already purchased the products. Reviews & ratings help the customer to know about the product in more detail from customer point of view. Customer can write their experiences by writing a comment or feedback and give ratings from high (5) to low(1). Reviews and ratings help customer in taking buying decision by influencing their opinion.

Security Concerns:Security concerns related to online shopping including hacking and misuse of the personal information like Debit/credit cards number, Net banking credentials, address, phone number of customers. Amazon provides a security check for all the online payments and information shared in the website as it is linked with many banks for making online payments. The website directs to the bank website making it safe to make payments.

Return Policy: Return policy refers to the policies that are applicable when the customers return the purchased product. The policy says about the terms and conditions to be applied when an online product is returned and the payment is returned back to customers.

Amazon online shopping website provides easy return policy service to its customers by providing a tracking system for the products and payments details. Customer can easily return the product online and keep a track of the return products and the payments. Return policy allows customer to shop for more products as it provides an experience of risk free shopping.

Online Patronage: The term ‘Patron’ means a regular customer. Online patronage refers to the regular customer of Amazon. The services and benefits Amazon provides to its customer help to gain more online patronage. The facilities like product assortment, product quality, price transparency, return policy, website convenience, reviews and ratings help Amazon to provide a good shopping experience to its customer and become an online patronage.

Construct reliability statistics

Table: Construct reliability statistics

Constructs	Construct reliability
Criteria	≥0.7
product assortment	0.840
product quality	0.887
price transparency	0.851
website convenience	0.833
reviews and ratings	0.912
security concerns	0.862
return policy	0.954
online retail patronage	0.933

Convergent validity

Table : Convergent validity

Constructs	CR	AVE
product assortment	0.887	0.612
product quality	0.917	0.688
price transparency	0.892	0.624
website convenience	0.875	0.539
reviews and ratings	0.934	0.740
security concerns	0.900	0.644
return policy	0.964	0.844
online retail patronage	0.949	0.789

Discriminant validity

The discriminant validity was assessed by the Average Variance Extracted for each construct compared with the corresponding Squared Inter-Construct Correlation (SIC), and the AVE estimate larger than SIC estimates below table presents results of the discriminant validity for each construct used in this study.

Table : Discriminant validity

Constructs	AVE	MSV	ASV
Product Assortment	0.612	0.523	0.427
Product Quality	0.688	0.429	0.536
Price Transparency	0.624	0.562	0.482
Website Convenience	0.539	0.473	0.479
Reviews and Ratings	0.740	0.651	0.628
Security Concerns	0.644	0.589	0.591
Return Policy	0.844	0.734	0.728
Online Retail Patronage	0.789	0.583	0.617

The price transparency will not impact the customer’s perception as the results of survey showed the hypothesis H3 will be rejected as the P value is above 0.05 which is at 0.116.

H4: Online customer’s perceptions of website convenience will be positively associated with perception of reviews and ratings

The Amazon website convenience will not support in building positive perception of customer by the reviews and ratings. The P value for website convenience related to reviews and ratings is at 0.166, which is greater than 0.05. Hence hypothesis H4 is rejected. Online customer’s perception of website convenience will be negatively associated with the perception of reviews and ratings.

H5: Online customer’s perceptions on reviews and ratings will be positively associated with online retail patronage.

As the P value for the online retail patronage is 0.166, the hypothesis H5 is rejected. Online customer’s perception on reviews and ratings will be negatively associated with online retail patronage. Online retail patronage will not be influenced by the reviews and ratings provided by the customers for the online shopping application of Amazon.

H6: Customers security concerns will weaken the relationship between reviews and ratings and online retail patronage.

The security concerns of customers and the reviews and ratings related to security issues and concerns posted by the customer on the Amazon website will affect the online retail patronage. The P value for the security concerns related to the online retail patronage is less than 0.05 which is at 0.012. Hence, hypothesis H6 is accepted. Customer’s security concern will weaken the relationship between reviews and ratings and online retail patronage.

H7: Customers return policy will weaken the relationship between reviews and ratings and online retail patronage

The results shows that the Return policy of Amazon and the customer’s perception of reviews and ratings related to return policy will impact the online retail patronage. The P value for the return policy related to the online retail patronage is less than 0.05 which is at 0.00. Hence, hypothesis H7 is accepted. Customer’s security concern will weaken the relationship between reviews and ratings and online retail patronage.

Table : Results of path coefficients

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	P Values	Results
Product Assortment Reviews & Ratings ->	0.092	0.105	0.105	0.880	0.379	Hypothesis H1 rejected
Product Quality -> Reviews & Ratings	0.328	0.316	0.113	2.888	0.004	Hypothesis H2 accepted
Price Transparency -> Reviews & Ratings	0.167	0.173	0.106	1.573	0.116	Hypothesis H3 rejected
Website Convenience -> Reviews & Ratings	0.141	0.159	0.102	1.385	0.166	Hypothesis H4 rejected
Reviews & Ratings -> Online Retail Patronage	0.133	0.141	0.096	1.387	0.166	Hypothesis H5 rejected
Security Concern -> Online Retail Patronage	0.189	0.188	0.075	2.511	0.012	Hypothesis H6 accepted
Return Policy -> Online Retail Patronage	0.606	0.599	0.082	7.381	0.000	Hypothesis H7 accepted

Conclusion

Reviews and ratings is a key variable in customer buying decisions from online shopping app Amazon. Since the consumer’s attitude, beliefs and perceptions may change the mind-set of the customer to either become a patronage or become a non-customer. As the e-retailing is booming in the market and many e-commerce are coming up, it is very crucial for Amazon to be the number one shopping websites by continuing providing variety of products and services to its customers. Majority of customers agreed that Amazon provides variety of products with better assortment. Amazon maintains the quality of the product from the process of storing, packaging and shipping of the product to the customers. Amazon provides product at reasonable price and offers products at sales like Deals of the day, Great sale, lightning offers of the day, etc. Majority of

customers feel Amazon shopping website user friendly and convenient to access. Amazon provides safe online payment as it has in-built links and navigations to various banks website. Customers feel it safe to make online payment and purchase the products. Amazon's return policy allows customer to purchase the product without the risk of damage by providing easy steps to return the product and track the status of the payment. Many customers shows positive opinion towards the reviews and ratings of product shown in website as it made them more confident to take a buying decision. Many customers responded positively towards having a good shopping experience in Amazon. The service provided by Amazon is up to mark and it added to online patronage of Amazon. The changes in technology, lifestyle, and social factor can change the way people use the internet to do things easier and faster. This gives rise to the evolution and changes in e-retailing. The demand for e-commerce is growing and it will never come down. There are untapped market segments for e-commerce including village areas, uneducated people, teenagers, senior citizens, housewives, etc. where Amazon can look for new opportunities. The sustainability of e-retailer Amazon will depend on customer satisfaction and this will help them to become online retail patronage for Amazon.

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DLT-DRIVEN-GLOBAL SUPPLY-CHAINS: TRUNCATING TRANSNATIONAL SUPPLY-CHAIN BARRIERS, AMPLIFYING TRADE VOLUMES AND INCREASING GLOBAL GDP

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Abstract : Supply-chains have gone global ever the since the inception of ‘Pax Americana’ with a multitude of companies aspiring for sales and profit maximisation and a distinguished international presence. A global supply-chain is a network created of individual integrated supply-chains or value chains of different companies worldwide that deal with a complicated matrix of people, processes, resources and information entailed in the activity of delivering (often converting) a product or a service from suppliers to customers. As the era of ‘Pax Americana’ comes to a likely end, global supply-chains have become a lot more intricate and susceptible to various supply chain vulnerabilities at the cost of increased international supply-chain blockades, falling trade volumes and negligible contributions to global growth. This paper determines to fill the void and resolve the aforementioned by introducing a novel supply-chain concept driven by the Distributed Ledger Technology (DLT). A DLT-Driven Global Supply-Chain to be precise! This paper offers an exposition to modernise global supply-chains powered by DLTs and resolve contemporary supply-chain issues.

Key Words: Distributed ledger technology, global supply-chains, value chains...

Introduction

Global supply-chains have evolved indefinitely ever the since the first wave of globalization hadstruck the world. Today, a global supply-chain is an intricate network created of individual integrated supply-chains or value chains of different companies worldwide that deal with a complicated matrix of people, processes, resources and information. Apple, which certainly has the best supply-chain network in the world, has a global supply-chain spanning over six countries and nine companies. With design and RandD in the United States, sourcing from over 150 suppliers in China, rest of Asia, U.S.A and Europe, manufacturing in China and Southeast Asia, warehousing in the United States and finally with distribution networks world over. 450-plus audits are performed in Apple’s supply-chain and the company directly or indirectly employs about 1.5 million people. Such gigantic global supply-chains offer the flexibility to reduce costs over the long run and run a low inventory and reduce off-season wastage but simultaneously increase production during a new product launch or increase in demand.

Global supply-chains (GSCs) are more or less are drivers of resource mobilization in the industry that aid companies gain a competitive advantage over their rivals. However, today GSCs have been ever-increasingly susceptible to various frictional inefficiencies and supply-chain risks and vulnerabilities that over the long run may turn out to be inalienable threats to major multinationals driving up costs and creating supply shortages. DLT is a consensus of cloned digital data shared across multiple servers world over with no central administrator being present in the network. Often this network is secured with cryptography and has a high-level of byzantine fault tolerance making it one of the most secure network technologies ever. Blockchain and Hashgraph are two widely known applications of DLTs. Thus, this paper intends to explore an integration of the distributed ledger technology into global supply-chains for effectively improvising them.

Objectives:

- To discuss contemporary frictional inefficiencies of global supply-chains, vulnerabilities and supply-chain related risks thereof.
- To study the far-reaching applications of distributed ledger technologies on global supply chains in effectively improvising them.
- To analyse a few case studies/industrial applications of such composites and explore the future of such composites.

Methodology:

Data sources collected for the purpose of this paper are secondary in nature such as white papers, international agency reports, reputed media sources and reliable web sources.

Limitations:

This paper limits itself to manufacturing supply-chains and does not consider service chains. For the sake of brevity, under DLTs, only Blockchain and Hashgraph were considered.

Contemporary Frictional Inefficiencies

Global supply-chains (GSCs) are massive networks created among multinationals world over for the production and distribution of goods and services to a global consumer market. “It is a global manufacturing network that coordinates the flow of human resources, manufacturing material, trade-related information and finance for facilitating such operations”. As mentioned earlier, today GSCs have grown more intricate than ever. It is often an integration of multiple value-chains, as in the case of tech-giants like Apple. Due to this ‘beyond-proportion’ increase in the size and complexity of such networks,

they have circumvented the perimeters of control, and have become prone to various risks and vulnerabilities. Which otherwise collectively be termed as 'frictional inefficiencies' and have started consuming on trade volumes and global growth. The following are the contemporary frictional inefficiencies in GSCs:

Inventory management risks: Insufficient inventory during an on-season could eat on potential profits, while an excess during an off-season would eat on operating profits.

Supplier risks: Over reliance on a single supplier could be drastic over the long run. They need to be diverse and flexible enough. Supplier relations are always key.

Safety and quality compliance: Addressing safety and quality concerns at every level of the supply chain is becoming tougher, as supply-chains get intricate than ever.

Cost management and control: Soaring fuel and freight cost, volatile raw material prices, increasing Labor rates, and technological costs force spikes in operating costs.

Shipment deferrals: Long-range logistics is always a risk. Overseas delays for globally sourced products can derail production and cause costs to increase.

Social compliance: Global sourcing calls for social compliance. Labor practices, working conditions and work-related compensations will always have to be revisited; else, an appropriate price will have to be paid for such negligence.

Cross-border legal issues: Operating globally across countries makes companies fall under multiple legal jurisdictions. Even a minor non-compliance, at any level of the supply chain, could threaten supply-chain activity.

International trade-regulation violations: The compliance department of a supply-chain have to be in line with global trade regulations, as excruciating penalties are a likely follow-up in every case.

Compliance with sovereign sanctions: Sovereign sanctions can often derail production lines as multinationals lose out on advantages from cost-beneficial hotspots.

Currency fluctuations: Foreign exchange rates are always a big risk for multinationals that force them to hoard cash offshore for longer durations of time.

Finance: Friction in payments amongst various members in supply-chains is a threat to free cash flows that can cause a hindrance in production activity. Establishing frictionless credit lines with banks globally is pertinent for a GSC.

Technological obsolescence: Technologies are getting outdated. Businesses, especially SMEs in the supply-chain are finding it harder to keep pace with them.

IP protection: Global supply-chains risk intellectual properties of large multinationals in countries with less-stringent laws in place.

Transparency and Provenance: Supply-chains are increasingly under the pressure of being transparent. Governments, consumers, international organizations and whistle-blower agencies are constantly behind firms that involve in egregious business practices. The 'source of origin' has also become important for consumers.

Carbon footprint: Reducing carbon footprint and supply-chain wastages by creating greener supply-chains has become a challenge for most multinational manufacturers.

DLT-Driven Supply-Chain Innovations

Distributed ledger technology (DLT) is a collective-term for technologies as the blockchain and Hashgraph under the purview of this paper. DLTs are often consensus-based shared ledgers or algorithms that clone digital data, shares it with across multiple servers in a network with no central administrator, often with a high-level of byzantine fault tolerance.

Blockchain was the world's first DLT put forward by its anonymous founder Satoshi Nakamoto through bitcoin. [1] It was a technological upheaval in response to the financial meltdown of 2008, to replace several existing BFSI conventions. Technically, a blockchain is a digital logbook of transactions or records (blocks) linked and secured by cryptography, wherein each block contains a hash pointer to the previous block, with a trusted timestamp and transaction data. Hashgraph was a concept proposed by the genius computer scientist Leemon Baird in response to blockchain's pitfalls. Hashgraph consensus algorithm uses the gossip protocol and the internet's voting protocol to achieve decentralized consensus and keep all the servers in the network updated. It is much fairer, secure, and efficient than blockchain and requires very low computational power compared to bitcoin's blockchain. [2] Currently, blockchain dominates the DLT-application market, but as time passes by Hashgraph is likelier to find even more potential industry-wide applications.

DLTs are certainly all-encompassing technologies. Their applications to global supply-chains in effectively improvising them and lubricating contemporary frictional inefficiencies is indispensable. Supply-chains are one area where DLTs can prove their mettle. Moving forward, I intend to study how blockchains can potentially disrupt global supply-chains and later the scope for Hashgraph in comparison with blockchain.

Blockchain-led Disruptions

Supply-chains, over the years, have become significantly fragmented, intricate than ever and geographically spread spanning over various time zones. Today, they have become increasingly opaque, inefficient and hard to manage. This has resulted in a lack of transparency and provenance tracking, increased carbon footprint from supply-chain activities, financial friction for firms involved, reduced managerial control, supplier risks, increased costs and various compliance problems. These commercial problems have a tech-fix in the blockchain.

Transparency and Provenance: Traceability and Security

- The blockchain can make immutable records of transactions such as the exchange of goods on block that would store all the relevant information related to supply-chain activities on a public ledger, such as the parties involved, date, location, quality of the goods at transaction time and price... etc.
- In addition, the ledger being available in the public domain would make it easy for any consumer-of-information to trace back to various supply-chain stages until their materials origin.
- The decentralized nature of the ledger will make it impossible for any single stakeholder to assume full control of the ledger.
- Cryptography and the immutable nature of the blocks on the chain will make it almost un-hackable and entirely resistant to alterations.
- Such transparency and provenance tracking can empower consumers and manufacturers equally by helping to determine the price and quality of the commodity and select manufacturers/suppliers based on environmental and ethical standards.

Automotive Payments Mechanism: Frictionless Finances

- Blockchain facilitates frictionless payments and transactions. Using a smart contract, automotive payments can be made to the supplier, as soon as the shipment is received and the terms and conditions are verified, at extremely low or no transaction costs at all.
- Most crypto-currencies are decentralized applications of blockchain that can facilitate such a mechanism, but the challenge is the rigidity of the conventional monetary system and the acceptance of these digital currencies as a global means of payment. However, this would ensure a smooth cash flow and would not disturb the production process.
- Lines of credit can also be issued in a similar way. The issuer of credit will need a smart contract to assess real-time factors relating to the credit-worthiness of the borrower.

Smart Contract Governance: Governance Automation

- Smart contracts [3] on the blockchain can be pre-programmed instructions that can be based on incorruptible business rules. Various supply-chain activities/internal trade can be pre-programmed on a smart contract, and the smart contract can execute them.
- This will lead to governance automation and eliminate control and managerial problems over the long run, effectively reducing 'vulnerable-human involvement' in governance.
- **RFID-based Smart Tenders: Mitigating Supplier/Contractor Risks**
- Using RFID tags, manufacturers can invite tenders from suitable bidders to perform various need-based activities on the supply-chain. Smart contracts will place bids and award the tender to the most appropriate bidder.
- Every transaction will be registered on the blockchain by the RFID tag and supply-chain activities can be recorded and traced simultaneously as tags move down the chain.
- This could be most beneficial in the case of global supply-chains, suppliers and producers are separated by geographical zones, and this mitigates supplier/contractor risks.

Third-party Obsolescence: Cutting Excess Costs

- Third-party service facilitators can be entirely written off from supply-chain activity. On a platform like the blockchain, producers can exchange skills, products or services without having to rely on a third party.
- The blockchain and smart contract architecture facilitates trust within and beyond the supply-chain and opens up so many potential service providers within a network, that third-party trust mechanisms is not even an option anymore.
- For instance, on the blockchain, third parties need to facilitate transactions amidst suppliers and producers. This does not just cut costs, but also keeps the supply-chain network even more secure as it does not require any exchange of confidential information with service providers that make transactions more vulnerable.
- **Corrective and Redistributive Mechanism: Increasing Supply-chain Efficiency**
- Blockchain-powered supply-chains can significantly reduce resource wastages and make production and warehousing activity more efficient because of the entailed smart contract mechanism that addresses real-time corrections in the supply-chain network.
- For instance, smart contracts can be used for redistributing excess power from solar panel micro grids that else may have been wasted. Cold-chain storage conditions can be monitored using smart contracts, and any deviations noticed regarding the storage facility's environment could be corrected real-time.

Autonomous Demand-driven Supply-chains: Enhanced Inventory Management

- Blockchains can run truly autonomous demand-driven supply-chains. However, this requires an integration of demand pattern analysis into a smart contract.
- Whenever there is an anticipation of a spike in demand, the smart contract raises the inventory level to a number apportioned by the analysis software.

Swifter SC-Logistics and Approval-supplifications: Reducing Shipment Deferrals

- If 3PLs, customs and other trade bodies are brought on board with the blockchain, shipping deferrals will drastically reduce, entirely revolutionizing the logistics industry.
- For instance, a single shipping container may need approvals from over 30 intragovernmental organizations at one time to leave a port. A single paper or approval lost or not submitted can cause great delays. Nevertheless, if those approval supplifications were to be submitted electronically as the container awaits deportation, the blockchain would confirm each transaction and finally executes a smart contract, after assimilating all required approvals for releasing the container.

Compliance Protocols: Fixing Violations

- Smart contracts can be programmed to perform supply-chain activity in compliance with international trade regulations, legalities of supply-chain spanning nations and sovereign sanctions, effectively fixing violations in world trade.
- For instance, if a certain country is sanctioned from exporting oil, compliance protocols can be programmed to avoid oil trade with that country. In addition, all domestic firms shall program smart contracts accordingly. Governments to check whether a firm was in line with a certain sanction can monitor compliance protocols. The same applies to trade regulations, where governments and international agencies can conduct audits.

Blockchain-powered IP Protection: Preserving Intellectual Property

- Global supply-chains run the risk of leaking inventions, model designs and intellectual property concerning latest technologies invested into and built by the operating firm. Blockchain can secure IP by creating a transaction record on the block.
- Information can be kept private and access can be limited, as there is an added layer of cryptography that intruders will find tough to bypass.

Scope for Hashgraph

Hashgraph can be considered as an alternative to blockchain technology, as it seems to be even more efficient, cost-effective, fairer and faster than blockchain. Hashgraph uses the gossip protocol, i.e. when two nodes in the network synchronize; they share with each other information that is unavailable in each other's domain. These synchronizing points are called circles, compared to blocks in blockchains. Moreover, for every two or more events, a witness circle forms that aids in virtual voting and achieving consensus, which is the basis for the validity of transactions. This is where Hashgraph outmanoeuvres blockchain, as it does not require cost-intensive proof-of-work computations.

Thus, Hashgraph can be a blockchain-alternative. They can effectively also be integrated into global supply-chains, the way blockchain can be. At this moment in history, Hashgraph can be preferred over blockchain for the following reasons:

Speed: Hashgraph is significantly faster than blockchain at over hundreds of thousands of transactions per second compared to blockchain's at-the-most 15/sec.

Miner's bias: Miners can choose the order of transactions in a blockchain, which could be fatal in real-time network implications like in supply-chains. Hashgraph employs consensus-timestamping to assimilate transactions in the order they took place.

Proof-of-works: Blockchain requires costly proof-of-work computations to validate transactions. However, transactions are validated at almost no cost on the Hashgraph, as it employs the voting protocol and conducts virtual voting using 'witnesses' to achieve consensus and validate transactions.

Byzantine Fault Tolerant: Hashgraph is a 100% Byzantine Fault Tolerant consensus algorithm. As virtual voting happens, no single entity can interrupt and form a misleading consensus or lead to no consensus at all. Blockchain has a high level of fault tolerance, but frequent hard forks suggest that it completely is not tolerant.

Efficiency: In blockchain, there are stale blocks, blocks that did not win the bid. In Hashgraph, every event/circle is added to and not discarded. Thus, it is a 100% efficient distributed ledger technology.

Hashgraph may likely reign over the blockchain. However, the blockchain is Sybil-resistant because of its complex cost-intensive proof-of-work computations. In peer-to-peer networks, Sybil-attacks are the creation of false identities by a network entity to increase in number and force a likely take-over. As there are no computational performance barriers for Hashgraph, they are highly prone to such attacks. Thus, Hashgraph may be a bad option as DLTs for public networks. Global supply-chains will have to be treated as something between a public network and a private centralized network.

However, smart contracts can be developed for various decentralized applications on the Hashgraph. Thus, many of the potential applications of blockchain in the supply-chain can also be implemented through the Hashgraph, that too with greater efficiency, much more speed and security, with a greater degree of fairness and low-computational power.

DLT-D-GSCs: Industry Applications

IBM: Transparent Food Chains

IBM is working with a coalition of some of the largest food suppliers in the world like Walmart, Nestle and Dole, and Driscoll's to make food supply-chains transparent and traceable to the source of origin and prevent the epidemic of harmful diseases and have a safer food chain. [4] IBM has also been involved in a similar project with Walmart regarding meat traceability.

Port of Antwerp: Blockchain Logistics

Port of Antwerp has lately been into logistics automation. According to port authorities, there are more than 30 parties involved in the process of moving the container on to the ship, which then results in hundreds of interactions among them and a lot of paperwork that it almost amounts to half the cost of the container. [5] Blockchain aims to speed up this process, while cutting costs and facilitate a distributed database that keeps fair records of transaction data.

Maersk: Digitizing Supply-chain Trade

The world's largest shipping company Maersk along with IBM applied blockchain for container shipping supply-chains and digitize the process, aiming to reduce red tape and paperwork, to fight fraud and fasten shipments by making these chains more efficient. [6]

Kuovola Innovation: RFID-based Smart Tendering

Kuovola Innovation has come up with RFID tags that help manufacturers place bids for getting from point A to B on a ledger. The appropriate bidder is awarded the contract and the transactions are traced by RFIDs and registered on the blockchain. [7]

Everledger: Transparency with Conflict Minerals

Everledger is employing the blockchain to fight for the transparency of diamond supply-chains. This is straight away aimed at avoiding the purchase of conflict minerals that finance the conflicts in African countries, market fraud and bonded labour.

Provenance: Traceability

Provenance employs the blockchain to track products all the way back to the source. It also makes a disclosure of the product's impact on the environment, and trace all suppliers and firms involved in the supply-chain and their activities.

BlockVerify: Fighting Counterfeit Drugs

BlockVerify aims at verifying the authenticity of medicines and fight fake medicines that cost hundreds and thousands of lives every year. Every drug will have QR code on its label, which has an independent identity on the blockchain. On scanning the code, all relevant information stored on the blockchain regarding the manufacturing of the drug will be displayed.

Concluding Remarks

Supply-chains are an innovation of the industrial mass production era. Now, almost two centuries later, they have gone global and have become bigger and intricate than ever and have transmogrified to 'rusting-links' in the production process. What was once an advantage has now become an exploitative vulnerability as only very few firms have successfully ploughed through. As I write this paper, 15% of global trade volumes and 5% of global GDP is at stake, largely due to the under-management of global supply-chains by both companies and nation states. If these supply-chain barriers were addressed, global GDP could rise by 6 times more than by removing trade tariffs. [8] In the wake of such a situation, only policy reforms will not do. DLTs, as discussed throughout this paper, can open up new ways to resolve contemporary frictional inefficiencies of global supply-chains. Some of the biggest problems haunting multinational manufacturers can be resolved using DLTs such as Blockchain and Hashgraph. A lot of fresh new start-ups and tech companies are venturing into this space, to explore the ever-expanding realm of blockchain applications. At this point, technological disruption in the supply-chain, due to blockchain, seems to be highly certain, as integrating transparency, security and trust into global supply-chains is the vision for the future. Therefore, DLTs are here to not just make breakthroughs in financial supply-chains, but also physical supply-chains, by enhancing supply-chain transparency and facilitating frictionless finances, automating governance, cutting on costs, mitigating suppliers' and inventory risk, increasing supply-chain efficiency, reducing shipping delays, finding a way to fix non-compliance and preserving intellectual property. The first digital revolution transformed the way civilization did commerce through the internet. Today, we are in the second digital revolution driven by distributed ledger technologies that is going to manifest an internet-like platform, which reflects true transactional value.

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IMPACT OF DIGITAL MARKETING ON BUYING BEHAVIOUR OF TEENAGERS

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Abstract: Digital Marketing has created a huge buzz in today's world. It is very popular in the younger generations, but the middle and the older generations are not touched by the wave of its scope. On domestic front it is used for interacting with friends and relatives and for the purpose of socializing. On professional front, it has been widely used for acquiring markets by new business ventures. Many established organizations are undergoing operational change in their traditional practices in order to adapt to this online environment for promoting their products and services globally. Social media has been the most recent and booming technological innovations. It offers a wide range of benefits. Advertisers are increasingly using digital and social media for mainline advertising campaigns rather than one of marketing exercises. They are now becoming the new barometer to gauge the popularity of a campaign before it is released on mass media. To keep up with consumers' digital advances, retailers are becoming savvy, implementing strategies and programs via smart phones, tablets and other digital venues. Digital marketing can take the form of push messaging, in-store digital signage, location-based promotions, email messaging and much more. This paper tries in understanding various aspects of digital marketing while connecting with younger audience. The study discusses the attitude of teens towards brand selection. The study is exploratory in nature. The research uses content analysis to conduct the research. This research is divided in three parts to understand the Impact of Online Marketing on Brand Selection by Teenagers. 1) Strategy behind Online Marketing to Teenagers. 2) Role of Online Marketing on Teenagers in Brand Selection .3) Benefits and worries of Online Marketing on Teenagers

Key Words: Online Marketing; Teens; Social Media; Brand Selection; Communication Channel

Introduction

Online Marketing is evolving in leaps and bounds. The new media has created its own unique space in the market which makes it impossible to search any new discussion. Online marketing has been the crucial part in current era. The new media is having immense potential to emerge a new segment of consumer. This new paradigm explores a platform to understand the consumer benefits and needs through reporting communication mix. Teenagers are playing a very crucial role in understanding of the new media. Companies have marked this segment as the most potential segment among rest. There are several reasons to enhance the purchasing power of teenagers The paper discussed the role of teenagers in the family buying process and online brand selection by teenagers. The researcher believes the importance of understanding the characteristics and buying process of teenagers before drawing their role in online marketing. Teenage is a transitional growth post the childhood. This development formed the psychological development in a teenager. Age of teenagers lies between the age group of 13 to 19 years. This transition involves biological, psychological and social changes. Dual family income and nuclear family are one of the crucial reasons which enhance the purchasing power of teenagers. Teenagers are playing a very crucial role in family buying process as they are tech savvy consumers. The new media i.e. online media is playing a very important picture while delivering the new product portfolio in front of consumers. As the data captured by Data monitor in 2007, \$1.2 trillion has been counted as men's, women's and infants clothing, jewellery, watches and leather goods in the global market. Among this 47.5 percent has been marked as women wear while 31.9 percent as men wear. Teenagers are forming a new relation with the new media and made them more tech -savvy Teens are carrying a special affinity towards international brand in India. There are several literature justifying the major goal of marketing to generate and maintain brand awareness Brand awareness is particularly important in low-involvement situation as it engaged consumers in making their search highly active in selecting the brand of their preference. Dotson and Hyatt (2005) tested role of peer group on gender difference and found group forming is highly influential in examining teenagers brand selection and the gender difference among groups creates different opinion in selecting the clothing brands. Parker and Charles (2008) defined group selection is more important than expressing one's own identity in related to fashion. While ShimAnder of Koh (1997) elaborated teens interaction with peer is very impactful in taking brand oriented decision. Bearden and Randall (1990) focused more on purchasing role of peer group and drawn their conclusion role on group identity.

As literature review suggested the role of peer group on teenagers in brand selection and its impact on brand identity, though only few literature are available on the role of new media in teenagers buying process. To highlight this, the research is going to discuss the impact of online marketing on teenagers. The study explored many qualitative research and literature review to understand the impact of online marketing on teenagers. The study is exploratory in nature and tries to understand the ways online media is changing their marketing strategies to influence teenagers.

Review of Literature

Priyanka Mehra (2009)

In her article, she reports that youth have always been a prime target for marketers. More so in India now, as two-thirds of the population is below 35 years of age. This segment has greater influence on **consumer spending** far excess of its numerical strength. Nine million people in the age group of 12-25 years from the top 35 cities (one million plus population)

in India are the ones setting the trends and raising the aspiration value for one-billion-plus Indians, stated Mind Share Insights.

Manjeet (1999)

In her article finds out that India's youth are ambitious, smart and technology-oriented. By 2015, Indians under 20 will contribute 55% of the population and yield proportionately higher spending power. In the west, the youth segment has almost overshadowed seniors. Rebellion was the key starting point. This model of targeting youth shows that it's always youth versus old. It also preoccupies itself with a continuous search for what's popular and happening among youth. Since the behavioral distance between the youth and the others in these societies is significant, it's easy to raise such points of difference.

Need for the study

Digital Marketing has brought astonishing changes in the way in which the marketer markets the product and the way in which the customers are buying the same. Buying behavior of an individual influences many factors, and these factors invariably affects the marketer to match the needs of the customers in general and youth in particular. So it is realized that there is a need to study Digital Marketing and its impact on buying behavior of the youth.

Research Methodology

The study uses both primary and secondary data. Primary data is collected through the questionnaire. Such secondary sources are drawn from the published articles, research papers, census survey, published general reports, sources through related websites etc.

Research Objectives

- To understand how the online media strategy works.
- To understand how companies are communicating their online strategy with teenagers
- To understand the benefits and worries of digital media on teenagers.

Sample Size

In order to fulfill the objectives of the study, a sample size of 60 teenagers were randomly selected from the city of Hyderabad.

Limitations of the study

- The study was done for short period which might not hold true long run.
- It was assumed that all response given by respondents is true and unbiased.
- Some respondents refused to participate in the survey and that affected the study
- The research covers respondents belonging to the city of Hyderabad only and not the whole of India.
- Time is one of the constraints to meet respondents.

ANALYSIS AND INTERPRETATION OF DATA

Gender of Respondents.

S.no	Gender of respondents	No. of respondents	Percentage
1	Male	20	40%
2	Female	30	60%
	Total	50	100%

It can be observed from the above table that out of the total respondents, 40% are male and 60% are female.

Age group of respondents

S.no	Age group of respondents	No. of respondents	Percentage
1	13-15	15	30%
2	16-17	17	34%
3	18-19	18	36%
	Total	50	100%

The information presented in the table shows that 30% students fall under the age group of 13-15; 34% students under the age group of 16-17; 36% under the age group of 18-19.

Monthly income of Respondent's Parents

S.no	Monthly income of respondent's family	No. of respondents	Percentage
1	Below 10000	3	6%
2	10000-20000	8	16%
3	20000-30000	18	36%
4	Above 30,000	21	42%
	Total	50	100%

The above table shows that the 6% of the respondent's family earn below 10,000; 16% of the respondent's family earn between 10,000-20,000; 36% of the respondent's family earn between 20,000-30,000 and 42% of the respondent's family earn above 30,000.

Do you use Internet?

S.no	Particulars	No. of respondents	Percentage
1	Yes	46	92%
2	No	04	8%
	Total	50	100%

According to the above table it is clear that 92% of the respondents use internet and 8% of them do not use.

How frequently do you use internet?

S.no	Particulars	No. of respondents	Percentage
1	Everyday	39	78%
2	When needed	11	22%
	Total	50	100%

The above table shows that 78% of the respondents use internet on a daily basis while 22% of them use only when needed.

What do you use the internet normally for?

S.no	Particulars	No. of respondents	Percentage
1	Mail	1	2%
2	Browse	3	6%
3	Shopping	15	30%
4	Social Network	30	60%
	Total	50	100%

It is shown in the above table that 2% of the respondents use internet for mail; 6% for browsing; 30% for social networks and 15% for shopping.

Do you think having an impressive website is more important for attracting customers?

S.no	Particulars	No. of respondents	Percentage
1	Yes	48	96%
2	No	02	4%
	Total	50	100%

As per the above table, 96% of the respondents think having an impressive website is more attractive while 4% of them think it does not matter.

Advertising on social media is more effective than other sources?

S.No	Particulars	No. of respondents	Percentage
1	Yes	47	94%
2	No	03	6%
	Total	50	100%

According to the table above, 94% of the respondents feel social media is more effective than other sources while 6% consider it is not.

How do you make your purchase decision?

S.No	Particulars	No. of respondents	Percentage
1	Watching Ads	19	38%
2	Reference	10	20%
3	Advertisements on social media	21	42%
	Total	50	100%

It is shown in the above table that 38% of respondents make purchasing decisions through advertisements, 20% of them through references, 42% based on advertising on social media.

Which media of Advertisement do you prefer?

S.no	Particulars	No. of respondents	Percentage
1	Digital Marketing	28	56%
2	Websites	10	20%
3	News papers	5	10%
4	SMS/ Hoardings	7	14%
	Total	50	100%

The above table shows that 56% of respondents prefer digital marketing mode of advertisements, 20% prefer websites, 10% prefer news papers and 14% prefer SMS/Hoardings.

Which of the following websites you think are best in reaching the customers?

S.no	Particulars	No. of respondents	Percentage
1	Company websites	07	14%
3	Social networks	25	50%
4	Shopping portals	18	36%
	Total	50	100%

The above table shows that 14% respondents feel company websites are the best sources of reaching the customers, 50% feel social networks are the best while 36% of them feel shopping portals are the best sources.

Do you think mobile advertising is effective for promotion?

S.no	Particulars	No. of respondents	Percentage
1	Yes	44	88%
2	No	06	12%
	Total	50	100%

It is shown in the above table that 88% of the respondents feel mobile advertising is effective for promotion while 12% feel it is not effective.

Do you think technology changes the buying behaviour of people?

S.No	Particulars	No. of respondents	Percentage
1	Yes	42	84%
2	No	08	16%
	Total	50	100%

The above table shows that 84% of the respondents think technology changes the buying behavior of the people while 16% do not feel so.

Benefits and Worries of Online Marketing on Teens

While there are risks inherent in online marketing, there are also many potential benefits. Such as, social networking can assist them in widening their networks and help them to build a good social platform which will help them to find new platforms to express their talents.

Teens are getting more familiar with the upcoming and emerging trends, through which they compare and follow the best among them. In this way, teenagers may increase their media literacy and get exposure to many new terms of social media.

Many teens find support in online communities; this is especially true for kids who have unique interests or feel isolated.

Online communities are very diversified, versatile and gives an exposure to teenager's to be upfront and put their viewpoints, ideas, and opinions on various issues.

Meredith and Schewe (2002) found independence, self expression, openness to new ideas and cultures, flexibility, mobility, and enjoyment of life as the forces behind converging values of global teenager's.

Findings of the study

The following are the findings of the study:

As per the survey made in 2017, Indians are the second largest users of internet, first largest users of facebook in the world. On an average, Indian's spend around 14 hours a week online, which completely overshadowed Television. The Indian Onlineadvertising market is growing fast at the rate of 50% per year andit was reported to cross 1000 crores in 2020. The

factors which generally influence the buying behaviour of the youth includes, lifestyle, attracting the opposite sex, purchasing power, family background, employment status of the youth, intervention of Western culture, educational qualification etc. India has nearly 90 million websites while that of Facebook profiles is more than 500 million. Every day over 8 million inbound and 12 billion outbound messages are sent via Whatsapp. Besides, online retail in India is on rise as 60% percent of web users in the country visit online retail sites. The study reveals that most of the youngsters of the present generation have access to the digital media but they lack the awareness about its optimum utilization. Using mobile internet and many more other factors account for a growing digital marketing industry in India. When all other industries in India are struggling with 10 to 12 %, digital marketing industry is booming high with 30% growth rate. Even after having such blowing opportunity, India still lack people who are skilled and mastered in Digital marketing. India needs talented Digital marketers who can use this opportunity which can create a revolution. Things will get better in the current scenario and in future too as India has the resources. All that to be done is to polish the talent. The markets of the present day also do lot of research to understand the youth and their buying behaviour pattern, so that they can match to the requirement of the youth segment. Buying behaviour is a changing factor and that too it is changing at a faster rate, so most of the products which is of recent innovation becomes obsolete too quickly. Innovation kills innovation. Due to changing technology what is an innovation today becomes obsolete tomorrow. This poses many challenges to the marketers. Majority of the respondents feels that any time purchase is possible through online. As per the present National Youth Policy there are around 33 crore population in India is the youth in the age range of 15-29 years. They form a major portion of market segment in India. Every marketer must understand the psychology of these youth segment, so that they can be a successful marketer in the days to come in the competitive economy. The Digital marketing which has revolutionized the economy in general and marketing in particulars poses many threat and challenges to the marketer in the competitive market.

Suggestions

- Marketers should adopt innovative methods to advertise products.
- They must upgrade with the latest technology
- Social media can be used in much effective ways to advertise and endorse products.
- New forms of gadgets like e-reader should find its way into the market.

Conclusion

Advertising forms an integral part of the marketing of products on Digital era. Teens often gravely underestimate the toll that their digital conduct can take on their reputations. The potential of online media is yet to be explored to its full potential in India. But the beginning has already been formed and raising its graph frequently. Social media is playing crucial role in delivering the impact of online media on teenagers. Companies can use social media as an asset and may use it for their benefits, though there must be some regulation and control for the further conversations. Though social media has immense potential, it should not be used to manipulate making teenagers their target. As this segment belongs to curious among rest, hence the online marketing highlighting teenagers must be ethically driven. Pros and cons must be checked when it's implied on teenagers through online marketing. However the potential of online marketing is often debated. One can do further research to find out the opinions and perceptions of the teenagers as consumers specifically relate to online.

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PROMOTING SUSTAINABILITY THROUGH CONSUMPTION- A STUDY OF CONSUMERS IN THE STATE OF TELANGANA

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Abstract

Purpose – Consumers are becoming more interested in environmentally friendly products, raising the demand against a limited supply. Today consumer lifestyles are served the shift towards sustainability. Similarly businesses across the world are witnessing changes that encourage sustainability and foster involvement of consumers in sustainable production and consumption. The aim of this paper is to explore how the Indian consumers are involving themselves in sustainable consumption and encouraging the use of green products.

Design/methodology/approach – The paper opted for an exploratory study of 170 consumers in the State of Telangana. The interpretation is done using statistical tools such as chi-square and regression.

Findings – The paper provides empirical insights into green issues promoted by companies in marketing green products. It also focusses on the reasons for unwillingness of people to buy green/eco-friendly products.

Practical implications – The study is relevant in terms of the various stimuli that encourage sustainable consumption and also documents the marketing strategies that promote sustainable consumption.

Originality/value – The study examines data from about 170 consumers in the state of Telangana and describes changes in attitudes towards environment protection and sustainability.

Key Words: Sustainable, Packaging, Marketing Strategies, Organic, Environment protection

Introduction

World environment is undergoing a drastic change on account of many factors such as climate change, air pollution, waste generation including recyclable waste and e-waste and natural disasters. This change has a significant impact on all the living organisms including humans. The factors affect the economic and social status of people. India is an emerging nation in terms of growth and also industrialisation resulting in environmental degradation through over-consumption and over utilization of natural resources. In the wake of such impacts, consumers are concerned about their environment and thus have changed their consumption habits. Companies are also conscious of manufacturing and marketing their products to firstly preserve environment and secondly reduce the environmental damage caused by the products.

Sustainable Consumption is not a result of statutory control. Rather, it arises from the values held by the consumer. Chan (1999) found that green consumption behavior is significantly related to concern for the environment and behavioral intentions, and that green consciousness and the promotion of environmental protection are both effective predictors of green consumption behavior

Kates (2000) commented that the over-exploitation of natural resources is the result of population exploitation and a substantial rise in the consumption increase. McDougally (1993) opined that environmental damage is fundamentally caused by over-consumption, making green consumption the answer for sustainable development. To reduce the destruction caused by consumerism, Kates (2000) proposed the 3R principle: reduce, reuse, and recycle. Ottman (1993) suggested that green consumption could be the trigger for a worldwide green revolution. Therefore the consumer has a critical role to play in environmental protection.

Review of Literature

Some of the significant studies on sustainable consumption and green consumption are presented below. As the concept of sustainable development is emerging, studies in the area are held conducted highlighting the most significant ones. Some of the studies are as follows:

Kamonthip Maichum, Surakiat Parichatnon and Ke-Chung Peng (2016) investigated Thai consumers who are aged over 18 years, and whose base education is high school, on purchase intention for green products by using an extended framework of the theory of planned behavior (TPB). The study derived and examined the model through structural equation modeling in a sample of 483 respondents in Thailand. The findings of this model indicated that consumer attitude, subjective norm and perceived behavioral control have significant positive influences on the purchase intention for green products. Furthermore, the results indicated that environmental concerns have a significant effect on attitude, perceived behavioral control and purchase intention for green products, but subjective norm.

Vasanthi .T. and Kavitha. N. (2016) explored the extent of the impact of consumers' buying behaviour towards the marketing of green products in Tirupur city. Convenience sampling method was used to select 100 respondents living in the city and who make purchases for the products. The findings of the study revealed that there is significant relationship between the variables which affects consumers' buying behaviour for green products. Similarly, the factors affecting the consumers' buying behaviour have major implications on purchasing decisions.

Oscar Otero Polo (2015) in his doctoral thesis commented that nowadays, instead of assuming more responsibilities to solve issues such as the social gap, global warming, species extinction or resource exploitation, many people limit themselves to drink fair traded coffee, eat local meat, or

buy hybrid cars to feel better. It was clear from the study that green products potentially signal social status and their consumption is not necessarily related to environmental concerns. The study evaluated the effects of green marketing on people's consumption behaviour and provided an overview of their preferences between regular and green products.

Shwu-Ing Wu & Jia-Yi Chen (2014), in their study constructed a model describing the relationships among perceived benefit of green consumption behavior, perceived risk, moral responsibility, normative belief, control strength, control belief, attitude, subjective norms, behavior control, behavior intention, and actual behavior. An analysis of 560 valid questionnaires resulted in six main findings: (1) Perceived benefit of green consumption has a significantly positive impact on consumer attitude. (2) Perceived risk of green consumption has a significantly negative impact on consumer attitude. (3) Normative belief and moral responsibility both have significantly positive impacts on consumer subjective norms. (4) Control strength and control belief both have significantly positive impacts on consumer behavior control. (5) Attitude, subjective norms and behavior control both have significantly positive impacts on consumer behavior intention. (6) Behavioral intention and behavior control both have significantly positive impacts on actual consumer behavior.

Geetha .D. and Annie Jennifer .D. (2014) in their research study in Coimbatore city selected a sample of 100 green consumers. The data was collected through structured questionnaire.. The data was analysed with the help of statistical tools like percentage, average, chi square, and likert scale technique. From the interpretation results were derived. Findings were summarized and presented. Suggestions were given. From the research study it is found that the most of the consumers in Coimbatore are aware of environmental problems and green products in the market. There is a positive attitude and behaviour towards ecofriendly products. The green consumerism gains momentum in Coimbatore.

Bipul Kumar (2012) in his study examined the purchasing behaviour for environmentally sustainable products using the framework of the Theory of Planned Behaviour. It investigated the determinants of the purchase intention for environmentally sustainable products leading to the purchase behaviour for the same. The data collected for the study was analyzed using Structural Equation Modelling (SEM). The result of the study indicated that environmental knowledge has a significant positive relationship with the attitude towards environmentally sustainable products. The strength of significant relationship between attitude and purchase intention is greater compared to the significant relationship between perceived behavioural control and purchase intention. Subjective norm was not found to be significantly related to purchase intention. The study has helped in understanding the relative strength of determinants of purchase intention with regard to environmentally sustainable products which lead to purchase behaviour for the same.

Abdul Samad Shaikh Dr. Mustaghis-ur-Rahman (2011) commented that environmental issues are increasingly transforming business practices and consumer behavior across the world. In this study, consumers' attitude towards green products has been investigated. Consumers' awareness of environment, their attitude towards environment protection, and their perceived functionality of eco-labels have also been investigated. Results indicate that despite significant awareness and positive attitude towards environmental protection, attitude towards environmentally friendly products is not significantly high. There has been found a significant positive correlation between consumer awareness of environmental issues and their attitude on green products. Correlation between attitude of consumers towards environment protection and their attitude towards green products has been found to be insignificant.

Research Gaps: After reviewing the above studies it is found that there is a research gap in terms of

- Issues addressed by companies that promote sustainable consumption.
- Reasons that compel people to buy green/sustainable /eco-friendly products and reasons for people not willing to buy these products.

Research Questions: The questions that compelled the author to take up this study are:

- With what intention do people buy green/eco-friendly products and does that intention gets captured by the companies manufacturing and marketing these products?
- What are the reasons for people not willing to buy products that encourage sustainable consumption and preservation of resources for future use?
- What are the various factors that lead to sustainable consumption?

Objectives of the Study

9. To examine the various green issues promoted by companies and analyse the marketing strategies that promote sustainable consumption.
10. To analyse the factors that influence people to opt for sustainable consumption.

b. Hypotheses: The following hypotheses are tested using various statistical tools.

Hypothesis 1

Null: Customer demographics have no significant association with the type of sustainable/green/eco-friendly product that they buy and use.

Alternate: Customer demographics have a significant association with the type of green/eco-friendly product that they buy and use.

Hypothesis 2

Null: Reasons for which people buy sustainable/green/eco-friendly products have no significant relationship with the green issues promoted by companies for sustainable consumption.

Alternate: Reasons for which people buy sustainable/green/eco-friendly products have a significant relationship with the green issues promoted by companies for sustainable consumption.

Hypothesis 3

Null: Marketing strategies for promoting sustainable consumption have no significant impact on the environmental claims made by sustainable/green/eco-friendly products.

Alternate: Marketing strategies for promoting sustainable consumption have a significant impact on the environmental claims made by sustainable/green/eco-friendly products

Research Methodology: This study is an empirical research paper wherein data is collected from primary and secondary sources. Primary data has been collected from 170 customers in total from the state of Telangana. The respondents were administered a questionnaire which was tested for its reliability and Cronbach alpha’s score are presented in table 1.1 below. Secondary data has been collected from books, journals and white paper series and research undertaken by leading research institutions. Statistical tools such as regression, chi-square test are applied. Simple frequencies are also presented besides cross tabulation of data. Analysis is done using SPSS 22.0.

Table 1.1

Case Processing Summary

		N	%
Cases	Valid	167	98.2
	Excluded ^a	3	1.8
	Total	170	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.612	47

(Source: Author- Primary Data Analysis)

2.1 Findings: The findings of the study are presented by testing the hypotheses.

Table 1.2 Descriptive Statistics about the sample’s Demographics

Sample Demographic	Frequency	Percent
Gender		
Male	91	53.5
Female	79	46.5
Age		
Below 20 years	14	8.2
Between 21 to 30 years	89	52.4

Between 31 to 40 years	48	28.4
Between 41 to 50 years	15	8.8
Above 50 years	3	1.8
Occupation		
Self employed	25	14.7
Employee in a private organisation	77	45.3
Student	30	17.6
Employee in a government organisation	14	8.2
Retired Employee	13	7.6
Homemaker	8	4.7
Others	3	1.8
Annual Income		
Below Rs 1 Lakh	58	34.1
Between Rs 1 lakh to 5 lakhs	53	31.2
Between Rs 5 Lakhs to 10 Lakhs	37	21.8
Above Rs 10 Lakhs	18	10.6
	4	2.4
Education		
High School	8	4.7
Diploma	60	35.3
Bachelor’s Degree	69	40.6
Master’s Degree	30	17.6
Doctoral Degree	2	1.2
Number of members in Family		
One person	8	4.7
2-3 persons	60	40.6
4-5 persons	79	46.5
More than 5 persons	14	8.2

(Source: Author –Primary Data Analysis)

Testing Hypothesis 1

Null: Customer demographics have no significant association with the type of sustainable/green/eco-friendly product that they buy and use.

Alternate: Customer demographics have a significant association with the type of green/eco-friendly product that they buy and use.

This hypothesis is tested using one sample T-test. The following results are generated:

Table 1.3 One Sample Test

Variables	Test Value= 0.050000					
	Statistics			Mean Difference	95% Confidence Interval of the Difference	
	t	Df	Sig. (2-tailed)		Lower	Upper
Type of Product (Dependent)	18.560	169	0.000	2.4588	2.19	2.72
Independent						
Occupation	24.543	169	.000*	2.7000	2.48	2.91
Annual Income	25.958	169	.000*	2.1588	1.99	2.32
Age	37.809	168	.000*	2.4319	2.30	2.55
Education	16.852	169	.000*	2.9117	2.57	3.25
Family Members	47.379	169	.000*	2.5823	2.47	2.68

(Source: Author-Primary Data Analysis)

From Table 1.3, an examination of the mean value suggests that each of the demographic variables have a significant association with type of product bought. The mean difference of the demographic variables education is highest i.e. 2.9 followed by mean difference for the variables occupation which is 2.7. It can be seen that the significant value p as calculated in table 1.3 is 0.00 for all the demographic variables. Hence, it is concluded that null hypothesis is rejected as calculated p value is .000 which is less than .05. Therefore, it is suggested that companies need to keep in mind the consumer demographic while marketing their sustainable/green/eco-friendly products. The choice of the product is determined by these variables age, occupation, annual income, education and number of members in the family.

Hypothesis 2

Null: Reasons for which people buy sustainable/green/eco-friendly products have no significant relationship with the green issues promoted by companies for sustainable consumption.

Alternate: Reasons for which people buy sustainable/green/eco-friendly products have a significant relationship with the green issues promoted by companies for sustainable consumption.

Chi-square test is applied to test this hypothesis. The various reasons for buying sustainable/green/eco-friendly products that were found from respondents are

1. Concern for Health (27.1% respondents)
2. Concern for Status (37.1 % respondents)
3. Concern for Environment (24.1 % of respondents)
4. Concern for Future Generations (11.2 % of respondents)

The author attempts to find if there is any relationship between these reasons and the green issues as promoted by companies. The various green issues that were presented to the respondents were: a) Pollution control, b) Local production, c) Use of natural ingredients, d) Recycled packaging and e) shorter production cycle.

The test statistics reveal the following:

Table 1.4 Chi-Square Test Statistics

Test Statistics	Pollution Control	Shorter Cycle	Environment Friendly	Local Production	Natural Ingredients	Packaging
Pearson Chi-square	33.073	16.472	26.683	24.825	33.503	22.863
df	16	16	20	20	16	16
Asymp. Sig.	0.007*	0.420	0.144	0.208	0.006*	0.117
N	170	170	170	170	170	170

(Source: Author-Primary Data Analysis)

From the above table 1.4, it can be seen that the calculated value of p is greater than 0.05 for green issues such as shorter production cycle, environment friendly products, local production and recycled packaging. While the calculated value of p is less than 0.05 for green issues promoted by companies such as pollution control and use of natural ingredients. Thus, it is concluded calculated value of p is .0007 (pollution control) and 0.006 (use of natural ingredients), the result is significant at $p > 0.007$, $p > 0.006$ and meaning that the alternate hypothesis is rejected that the reasons for buying sustainable/green/eco-friendly products have no significant association with green issues of pollution control and use of natural ingredients. On the other hand, it can be seen that the calculated value of p is .0420 (shorter cycle), 0.144 (environment friendly), 0.208 (local production), 0.117 (recycled packaging) which means that the result is not significant at $p <$ the calculated values as above meaning that the alternate hypothesis is accepted and these four issues have a significant association with reasons for buying sustainable/green/eco-friendly products.

Hypothesis 3

Null: Marketing strategies for promoting sustainable consumption have no significant impact on the environmental claims made by sustainable/green/eco-friendly products.

Alternate: Marketing strategies for promoting sustainable consumption have a significant impact on the environmental claims made by sustainable/green/eco-friendly products

Regression is carried on to see if marketing strategies have an impact on environmental claims made by the companies.

$$Y = X_1 + X_2 + X_3 + X_4 + X_5 + X_6$$

The various marketing strategies for promoting sustainable consumption are

X₁ = Informative advertising about saving environment.

X₂ = Green Contents of the products

X₃ = Green Themes in the advertisements

X₄ = Educational Marketing Campaigns

X₅ = Environmental Audit

X₆ = Green Branding

Table 1.5 Regression for marketing strategies and environmental claims

R	R Square	Adjusted R Square	Std. Error of the estimate
.139	0.19	0.17	0.79

a- Predictors: (Constant), Channel Innovation (Source: Author-Primary Data Analysis)

Table 1.5.1 ANOVA Model Summary

	Sum of squares	Df	Mean Square	F	Sig.
Regression	10.184	6	1.697	.529	.786 ^a
Residual	520.195	162	3.211		
Total	530.379	168			

a. Predictors: (Constant), Marketing Strategies

b. Dependent variable: Environmental Claims (Source: Author-Primary Data Analysis)

The r^2 is 0.19 meaning that there is around 19% variation in the environmental claims that is explained by the marketing strategies. It is also seen that the p value as calculated above is .786 which is greater than .05 and therefore the alternate hypothesis is rejected and it can be said that marketing strategies do not have a direct impact on environmental claims. Nevertheless, the banks moderating effect of marketing strategies can be seen on environmental claims when companies use eco-labels and carry environmental audit create state of art systems to deliver green products.

3.1 Conclusions: The major conclusions of the study are drawn from the review of literature and analysis of the primary data.

It is seen that majority of the respondents prefer organic fruits and vegetables to conserve environment and surprisingly followed by construction material that is eco-friendly.

Respondents also preferred eco-friendly electrical appliances followed by clothing and apparel.

The main reasons for respondents opting to buy sustainable/green products are concern for health followed concern for future generations. 39.4 % of respondents felt that there is lack of awareness among people about green products while 40 % respondents said that green products are expensive to buy. Another 20% respondents felt that people lack belief that green products perform what they promise.

It is concluded that 55.9% of respondents who used green products are satisfied while another 54.1 % of respondents said that they would recommend the green products to others.

3.2 Suggestions: The study has implications for companies in terms of the marketing strategies used by them in promoting sustainable consumption. Consumers opined that recycled packaging, shorter production cycle and locally produced products are significant for convincing them about the greenness of a product. Therefore, companies can concentrate on incorporating these strategies in marketing their products.

It is also suggested that companies use eco-labels to create awareness about the green products.

It is recommended that educational marketing campaigns build consumer confidence on the greenness of the product; therefore companies can conduct such campaigns.

It is also seen through this study that the product that promote sustainable consumption are not widely available and therefore it is recommended that companies facilitate mass distribution of these products.

3.3 Scope for Future Research: There lies an abundant scope in conducting research in the area of sustainable consumption and marketing. The moderating effect of sustainable marketing on Attention, Interest, Desire and Action (AIDA) can be studied. Studies can also be taken up in the area of various factors that stimulate sustainable consumption.

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A TRENDING MODEL AT NETFLIX: BUSINESS MODEL INNOVATION

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Abstract : Innovation is the key to unlock the potentialities in today's business. The Business Model Innovation has gained momentum as a measure to evolve and upgrade the existing business scenario. It starts with the development of new unique concepts supporting an organization's financial viability, including its mission and the processes for bringing those concepts to fruition. BMI takes up a prominent role in the entertainment industry today. Netflix, has utilized this model and the present article is an example of BMI upending the traditional video rental market, the company has also leveraged new digital technology to gain an edge over its competitors in the streaming media business. Netflix as an organization, has made its presence felt in the global market, but the present study seeks to portray the concept of BMI in Indian Perspective and its applicability impacting the Netflix organization. The article compares movie goers and users of Netflix in order to gain an insight into the growing demand for Netflix as against visiting theatres. Collecting sufficient information to interpret the objectives under study, we used a combination of both primary and secondary data, limiting the scope of the study to the youth. To conclude, BMI of business health in the technology era compels an alignment of Information technology and business goals, with ultimatum being to enhance processes and the organization. Will the trend of watching movies at our houses (using Netflix) with our family and friends be the next generation of entertainment?

Key Words: Business Model Innovation, innovation, digital technology, Netflix.

Introduction

Traditional models of business have become outdated. Technology has broadened the mindset of people's thinking as new and innovative models have crept in, to make life easier and businesses more profitable. A recent technological innovation being used in organizations today is that of Business Model Innovation. It has revolutionized the way businesses operate. It has gained financial viability, improved processes and realized revenues, thereby creating value for the business organizations and ultimately benefitting its customers.

The digital era has aided the growth of the business model innovation as organizations have transformed themselves to operate and provide services in a better and improvised manner than usual, to its customers. Innovation has become the key to operational and financial aspect, as the digital disruption brought about by the Business model innovation has shortened business model lifecycles. Globally, the markets have found Business model innovation to forge ahead, make strategic moves and compete globally, fostering growth internationally.

Objectives of the study

The present objectives of the study are to

1. Understand the Business Model Innovation in the Indian Perspective.
2. Determine its applicability to Netflix organization.
3. Make a comparative study between the preferences of Netflix as against theatres.

An In-depth Insight into Business Model innovation

The business model is an analytical concept used to understand a series of decisions of what make up a business, by utilizing innovative methodologies. In this context, Business model Innovation is a conscious effort to systematically understand business using technology to satisfy customer needs more effectively and efficiently. A classic example of BMI is the introduction of iPod, iPhone and iTunes products by Apple, which enabled the company to race ahead over its competitors. Innovation and ability to adapt to changing technology, has made Apple have a leading edge over Nokia. Nokia once was the market leader whose sales in the mobile market across the world was 60% but it dropped to 10%, as Apple's trending technology in apps and good interface revolutionized the market for smartphones and Nokia which was number one company and felt that it could do nothing wrong, it faced bankruptcy and had to sell its \$50 million worth company for just 7 million to Microsoft, as it was reluctant to adapt to innovative technologies [Apps and interface], focusing only on hardware.

Business model innovation is transformational and technological. Improvements are constantly used in product updates. This results in enhancing performance and cost-cutting. It is very useful for large concerns and adding its innovation can be a boon for a business in long term survival. A startup company can also be at an advantage as they bring a change to enhance their performance.

The successful implementation of BMI in the digital era needs a blend of Information technology and business plans to execute processes and structures in an organization. Stakeholders in a company have an important role to play in selecting means to apply latest technology to maximize the Business innovation model successfully.

Thus Business Model Innovation model can aid in managing changes, evolve in customer offers, provide customized offers and improve value chain of consumers.

Crafting a Successful Business Model Innovation

The system of Business Model Innovation utilizes existing products using the current technologies for the real markets. The model entails knowledge of important decisions that together enable an organization to earn profits, expend its costs and grapple with risks. This implies that innovation is the key to unlock the potential in the organization, to improve a company's combination of revenue, expenses and risks.

There are several factors that add up to a company's value, as it utilizes the Business Model Innovation to leverage itself and prove reliable and effective. They are:

Figure 1: A Framework using BMI



Creating value for its product and service mix:

The first and foremost challenge that an organization faces is its Product and Service mix. Organizations need to constantly recalibrate their product and service mix and focus their business across products, product lines, promotional techniques, segments used, technological improvements, selecting common-sharing factors across products, choosing an assortment of products or markets to minimize risks of the Business Model Innovation. All these crucial dimensions are value-creating factors to enhance the credibility of products and services being offered by a company.

Taking strategic decisions at the opportune time.

To successfully implement the Business Model Innovation, a proper decision at the opportune time should be taken to benefit the company. An example of Apple Inc would explain this rightly.

Selecting the right team to decide.

A well informed and empowered team of decision makers, can carry an organization forward. Example- Google, Walmart.

Collaboration to Create Value.

The Business Model Innovation envisages decision makers to join and adjust their mission to create value without disrupting the value chain. They effectively change the revenue stream to align with the stakeholder's decision and build relevant metrics to improve performance standards. The key decision makers also synchronize time horizons to combine flexibility and craft enduring relationships to motivate and create long term value for managing relationships. This also helps a company to successfully integrate operations and develop contractual arrangements and system between the company and other parties, also a part of the system.

The above-mentioned framework can help to craft a successful business model to integrate people, processes and systems. Also, prepare to create better core competencies resulting in a sustainable competitive advantage.

Adoption of Business Model Innovation at Netflix.

A classic and practical model of Business model innovation is followed at Netflix. Netflix stands as a global leader in entertainment service with 109 million users over 190 countries enjoying more than 140 million hours of TV shows and movies per day, including original series, documentaries and feature films. Members can play, pause and resume watching, all without commercials. A mode to analyze the shift to the Internet Television from linear Television is Netflix. Linear television lacks personalized experience and availability on any screen which has made space for Internet Television to grow and Netflix exactly does this. Netflix has modified its business model from a linear rental video market to a novel, internet based video rental system to make the fullest of the flexibility and ubiquity of the internet around the world. Netflix is cashing in on the psychology of the consumers to conveniently view their preferences at the place of their choice. This entails a twin benefit to the consumers and the business organization. The choice of Internet television needs an improvising in its business model and adapts to the era of technology. It also projects the content people love, Netflix attracts a wide variant of users, having broad tastes, as internet offers individual users to watch their preference by making recommendations on their past moves. Netflix is a focused passion brand; it does not make use of pay-per-view or ad content. Netflix are a movie and TV series based entertainment network. On the note of their competition, they compete for a share of members time and spending for relaxation and stimulation, against linear networks, pay-per-view content, DVD watching, other internet networks, video gaming, web browsing, magazine reading, video piracy, and much more. More than anything, it is true to believe that video piracy stands to be the largest competitor for any source of entertainment, but inexpensive and reliable business model of Netflix can prevent the decline of such online video rental market in access to free and pirated video. Understanding that awareness of Netflix in Indian markets receives mixed responses and that there are cultural differences and some variances in content tastes around the country. There are also challenges with the

broadband and payment infrastructures in certain states. It is believed in the growing ubiquity of the internet and rapid technological progress, the refined storytelling and regional touch has universal appeal which will transcend borders.

The entertainment industry has witnessed different phases of transformations with the changes in technology. The year 1997 saw the DVD rental by mail, today after 20 years, we stand to witness the Business Model Innovation in operation as a successful innovation from emerging entertainment companies more specifically- Netflix.

A Need for a Paradigm shift in the Mindset:

The Indian urban educated population is towing the idea of utilizing Netflix as an entertainment alternative to the theatres. A lot of ground work has been initiated thanks to social media. Facebook with a million-user base has become the right platform for Netflix to advertise its presence. Facebook has been actively projecting pop-up ads about the positive viability of Netflix as a popular mode as compared to theatres, but there is a constraint and that is the people’s mindset has to be made in tune with this proposition.

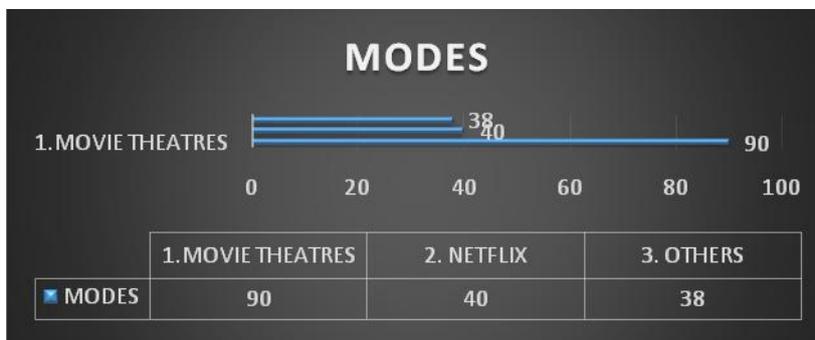
Data Analysis and Interpretation

In order to drive across our motives for the study, we have conducted a primary survey consisting of 150 active, educated respondents around the age group 16-25 to find out their perceptions towards the use of Netflix, as an alternative mode over theatres. This age group was selected on purpose as they are the future generation, who would be impacted by the changing technology. Secondary data have also been used. Online sources were mostly utilized, due to lack of time. We have covered a few factors such as their preferences, advantages of Netflix, change in the mindset of the people towards using Netflix and creating awareness about Netflix.

A detailed analysis of our study has been covered in the following pages. The various aspects covered include the modes of viewing movies and other forms of entertainment, advantages of Netflix and the need to create awareness among the people about the importance of having to select Netflix as a viable mode of entertainment (Table 1.1, 1.2 & 1.3 are viewed below).

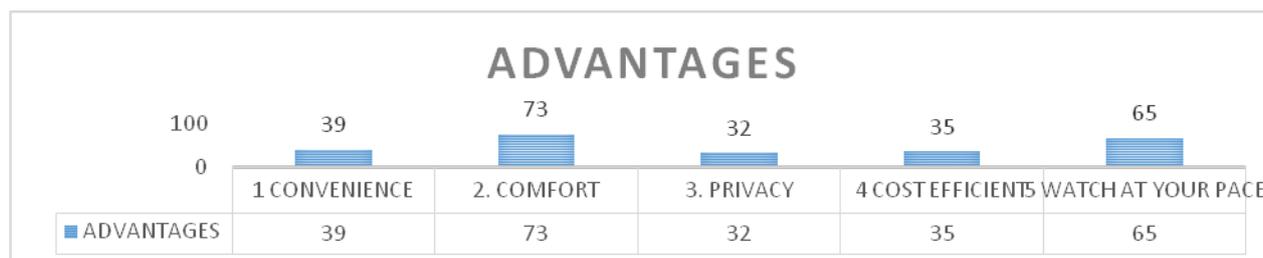
Table 1.1 depicts the mode preferred by Indian users if allowed to make a choice to watch a movie, as stated before, the mindset has been settled to a theatre ambience that dominates the choice, which is followed by Netflix, which clearly shows that delay is never a denial, the technology to pick up is slow paced but there is always a scope for acceptance.

Table 1.1



Watching movies always involves getting ready, travelling to distances to reach a theatre and dealing with the pollution while travelling, not to mention the traffic congestion in cities. Netflix as an alternate mode of entertainment could overcome all these problems, and as we can see from Table 1.2 the respondents find it convenient (39%), comfortable (73%), personalized (32%), Cost efficient (35%) and 65% of them find it convenient to watch at their pace.

Table 1.2



There are many benefits that Netflix can offer to the community of viewers. Table 1.2 indicates that there is already a positive change happening that can be seen. Netflix has to take an active role in nurturing change in people’s mindset as well

as trying to capture the market using various promotional techniques. To increase the visibility of its presence, it is important for Netflix to advertise in modes preferred by its target audience. It has already tapped an active mode through utilizing the services of Facebook.

Table 1.3 Educating the People about Netflix



Netflix is an innovation of its kind, using the internet as a strong base to provide 24/7 entertainment ranging from viewing documentaries, movies, T.V shows which can be viewed using a television screen, internet connected screen and mobiles. This is not an end to the improvisation, from theatres to online watching and linear television to Internet Television and many more ways like Virtual reality vision or 3D sound experience are yet to make their way again as Business Model Innovation offers services in a better way to gain acceptance by its target audience, moving with fast paced and upgraded times in context to technology. It also needs to innovate ways to deliver services in a better way to its customers, and create more awareness to increase its user base (Table 1.3 reveals that that 69% of the youth are already aware of the presence of Netflix, indicating their usage). Thus, it has to strike the right chord at the right places to make it the most happening mode of entertainment for the future generations.

Findings, Suggestions and Conclusions

The findings make a comparative study of movie goers and users of Netflix, to interpret the acceptance of emerging trends in entertainment. The emerging source of Netflix in the Indian market needs time to develop, as the population need to acclimatize themselves to the use of Netflix, as against viewing movies at the traditional theatres. Initially there would be resistance in the infancy stage to subscribe or become a user of such mode of entertainment, but eventually people will gain awareness and be benefited, and so the numbers grow.

The entertainment industry has seen revolutionary changes in its methodology of viewing content. Different forms of technology have made entertainment more proactive and personalized. Netflix is only projected in few national languages, it may be suggested that it can be telecasted in more regional languages and dialects to gain momentum. We have analyzed the impact of BMI on Netflix to know whether it can be considered as an option over theatres, but we have found that Netflix as a viable alternative has a long way to go, in order to become popular as a technological breakthrough. Netflix has imbibed the Business model innovation model to gain a competitive edge over the media businesses. Netflix customers can view original series, documentaries, films, shows, and TV directly on the internet connected screens, Televisions and Mobiles. We believe that the thinking pattern of the people towards Netflix is still underway, in spite of the fact that Facebook has been an active partner in promoting its usage. It has also been observed that Netflix is only viewed by a section of the urban population although it exists for quite some time. A “bottom of the pyramid approach” can be visualized to spread awareness in the hinterlands of India for making it popular and cost worthy. We have not reviewed its popularity across developed countries. There is still a wide scope for more studies that would throw light on the subject using BMI across the entertainment industry.

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FROM RURAL MARKETING TO DIGITAL MARKETING

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Abstract : This research was conducted with an intention of revealing the endless horizons of paradigm shifts in the marketing norms and routines that have been in existence since the time of serious business operations took chance and spread all over the whole world, as the most and best accepted means of conducting business activities. A lot has taken place so far in the world of business and more so, on the marketing. Since technology has paved its way through and safely secured a chance in the business world, it is now inevitable to consider the extent to which it has affected all the business operations so far. Right from the production process, all the way to the marketing strategies, technology has been heavily embraced with an intention of making things easier and the end products to be of more quality. Consequently, the research would wish to get a clear picture of this model that is used in technological marketing strategies. The research would find how the digital gadgets and platforms such as use of mobile phones and the internet is integrated to enhance the trusted ways and secure means of online business transactions. The paradigm should therefore give a clear picture and a 100% credible image that will make it possible for one to understand and hence be able to develop a vivid conceptual model pertaining to digital marketing. The research will therefore expound on how the technological influence on product marketing has so far led to various advanced and pleasing outcomes as a result of the ability to reach a wide range of customers of certain products.

Key Words: Digital marketing, rural marketing...

Introduction

Business can be a very interesting activity especially when it is running smoothly and is proving to be profitable to its operators. Many business people try to put in place various mechanisms and techniques that would consequently see them at a better position as compared to their competitors. But due to the advancement in the technological techniques that emphatically apply to the field of business, there have been so many benefits that have been accrued and hence giving birth to pleasant and reliable results hitherto.

Indeed, the trends in the business marketing environment have so far been able to mark a clear paradigm shift, right from the old way of doing product promotion to the fathomable technological way of doing so. Change is always inevitable, and thus every right-minded business person is nowadays creating decisive emphasis in the accommodation of technology as a way of surviving in the current business world. Companies have so far invested a lot of finances and unending focus to the proper and beneficial use of technology especially when it comes to the forms and means of marketing (Castellacci, 2008).

Digital marketing model is the current trend used as a means of marketing and selling of products, through the use of internet. Users can therefore be able to make use of mobile phones, computers and other electronic gadgets that can be able to access the applications and websites that are necessary for such transactions.

Important to note, transfer of money via the internet has made it possible for the parties involved due to the implementations of sophisticated systems that are capable of handling such technical transactions. Digital marketing involves programmatic buying and selling of products via such online systems. Marketers are able to make advertisements and be able to reach their target market group wherever they are in the whole world.

It is highly acceptable that the current generation is more into the media than ever before. A great percentage is using mobile phones to enhance communications and monetary transactions nowadays. A very big population is fully dipped into the current innovations related to social media and thus most of the mobile users may spend a lot of their time in the phone than any other activity. Thus, this kind of a scenario is taken as an advantage for the online marketers whose assurance is that they will be able to reach their clients in an easy way; via the use of their own gadgets (Chaffey et al., 2016).

This research paper will therefore major its focus on how technology has been embraced in the area of digital marketing, its paradigm and paradigm shift. In addition, the study of all possible challenges that are associated to this form of market, together with its possible solutions, will be keenly evaluated to the latter.

Review of Literature

The research on digital marketing will generally cover several themes that are directly related to the technological driven paradigms in marketing.

According to a research conducted by Belk based on consumer digital culture, is that, consumers or clients for online marketing consider themselves as possessing in different personas by which they are capable of possessing and accessing several or multiple online selves. Thus these customers can manifest themselves in multi-identities and thus be able to widen the market available for digital marketing (Belk, 2014).

McQuarrie et al. did a research on the "megaphone effect", that is, the capability of consumers being able to access a big range of audience via the use of the social media. He indeed elaborated on how bloggers enhance and create a culture related

to the good taste of the activities that are enabled through the social media (McQuarrie et. al. 2012). Bloggers are able to identify and note the environment in which they can capture their audience by providing what seems to be of good taste and hence capture the attention of the targeted customers in within the social groups such as Facebook. This kind of scenario explains the reasoning behind getting an extended reach of customers' in the today's digital marketing world.

Digital advertisement has of late become a very vital activity by which consumers behavior are taken into the account depending on how they get to react to the aspects of various digital ads. With respect to the study that was carried out by Lambrecht and Tucker on the consumers' responses through the visit of various websites is that consumers may give negative responses as a result of inadequacy when it comes to the meeting of consumer's preferences (Lambrecht & Tucker, 2013). It is therefore when these tastes and preferences are partially met, that the clients are not pleased or fully convinced that they will be satisfied by the product being offered.

According to Tucker 2016, is that, consumers feel more satisfied when they are making use of personalized websites that make it possible for the users of the system to be able to have security on their personal details. This leads to a positive review of a digital platform that is being used for online marketing (Tucker et, al., 2016). Customers will be in a better position to feel secure and hence end up trusting the advertisements ads that are available on such websites. This kind of setting is based on psychological reactance whereby the consumer digital privacy is supposed to be of high peaks for the trust to go even far much beyond the normally expected outcomes.

Moreover, Luo et, al. conducted a research on the numerous digital advertisements responses and thus investigated on the factors that influence the increased popularity for mass-buying ads and found that, the social influence to have been the major factor that acted as the driving force for popularity (Luo et, al., 2008). He also realized that, while customers use the search engine to find some important information, they prefer the use of few keywords since they find it more profitable.

Puncinelli et.al did the examination of the digital video advertisements such as in the YouTube and Hulu and also the TV shows. He realized that the advertisements had the effects on the emotions of the consumers with respect to the way they are programmed and appealing to the customers. It followed that, when a customer's emotions are deactivated or for example are driven to sadness or deep feelings, the energy to view other energetic advertisements is reduced respectively (Hamilton et, al., 2004). Moreover, Dinner et al, did the consideration with respect to how search the drivers that contains the advertisements and discovered that digital ads are far much effective as compared to the offline ones.

Paradigm Shifts

There have been so many changes that have taken place since last five or even ten years down the line, on the technological marketing strategies. Consumers have grown so many expectations than ever before. This has been so due to the access to the communication channels that enable them to get information and create the model that if satisfied, they can be very comfortable like never before. On the other side, it can be noted that marketers have also not been left behind of this golden chance to better their reach of the target customer scene. Marketers have therefore been able to access the relevant communication and assignation channels that they lacked for the last five or even ten years (Castellacci, 2008). Through this avenue, they are therefore able to meet their customers' expectations. The following are the marketing paradigms that are necessary for the digital marketing and whose embracement would see markets' competitors' offside of the game area.

Social Business

A social business will have the following attributes:

1. **An** executive high level support is of high significance so as embrace a clear and transparent approach in the marketing, with the full involvement of all categories of management.
2. A serious commitment of strategies that are content based and includes all the consumer-facing sectors with no reservations or exceptions.
3. A clear understanding is required so as to realize that the social media networks are just but means to end and hence have a very significant role to play when it come to the content delivery the allowance of interaction with the audience.
4. There should be intensified use of arsenals that are essential in the facilitation of the development of the content necessary for the social sharing and engagement alongside evaluation of outcome.
5. Very keen engagement for the data that is targeted to be accessed by the audience alongside the sentiment interaction with the target group and hence direct the intelligence with the inclusion of the closed loop marketing.

It was realized that, smaller companies/ business are at a better hand to engage and embrace on a social business as compared to the big ones.

Employee Branding

Companies should have so far realized the need to encourage their employees to construct their own brand. However, some have not yet come to the right-minded understanding of why such should happen. Some think that once employees are given the chance to come up with their own brand, it would be jeopardizing the organizational progress in one way or the other.

If a company puts on restrictions on its employees from developing such personal brands, it is doing so its own self. On the other side, it will be developing its own brand through allowing its employees to develop such personal brands that would at the end benefit the company when it comes to the digital marketing strategies. Alternatively, it is the responsibility of the organization to encourage the employees to develop such brands in a way that would be of mutual benefit. Thus, both would now begin to enjoy the benefits of such kind of social branding and hence it needs to be well and keenly planned so as bring the halo effect between the employer and the employee.

According to Michael Brenner of SAP is that, one of the ways by which an organization would encourage employees to develop their personal brands is to possess their own blog. Unfortunately, not all employees are well fitted to have their brand or blog and have a collaborative correspondence to the corporate brands. Thus, numerous ways do exist that can be used as an encouragement to the employees guidance on the construction of their own brand that would yield to a mutual benefit. It can therefore be deduced that, digital marketing would be greatly feel the impact associated to the organizations branding, which emanates from the employees personal branding. Finally it should be clear that social background created by the organization would greatly determine the perception of their brand to its audience.

Delivering Experiences

It deems very appropriate for the customers to have the feel of your brand, instead of just reading about it in the blogs. Thus, very powerful campaigns that are intended to touch the heart of a customer until he is convinced should be deeply embraced. They can be made possible through transmedia campaigns.

Data Driven Marketing

There should be the employment of the mechanisms by which the various measurement tools are used with an intention of determining the marketing plans of an organization. Thus, data measurement tools should be used to determine the reach, engagement and interaction between the organization and its customers. Systems such as the CRM systems should be integrated so as to make the whole exercise a success.

Findings

It can be deduced that, the technological driven paradigm marketing is shifting at a higher rate, than anyone can expect. This has been as a result of new discoveries in the technological world, and hence businesses taking an advantage so as to keep an updated track of operations that match the required standards of marketing. It was discovered that, most of the current business are/ have been digitized so as to meet the current digital marketing status.

With no reservations, it could be agreed that most of these digital marketing is founded on the social media background and thus there can be no exclusion of the social aspect while carrying out transactions that are online based. Moreover, use of digital gadgets has to a greater extent made it possible for such business to prevail. Use of mobile phones and personal computers has enhanced the online transactions to a higher rate than ever before. This is simply so because, majority of the people in the whole world have access to mobile phones and have the relevant knowledge and skills to go carry out such transactions.

Unfortunately, a lot of misery is currently taking place and the conmen who are a scaring ghost in the online business have increased proportionately. Thus the trust on whom, where or which platform/ blogger to trust is really in trouble.

Recommendations

It should be clearly noted that, the social and digital behaviors related to the customers is growing at a relatively higher rate. Thus, it is the responsibility for every company that would wish to compete fairly to its competitors, to start digitizing its marketing strategies.

As all this is put in place, it should be noted that, social media relationships between an organization and its clients would accrue a bigger advantage than ever before. Future researches should be made to focus on the approach of online WOM and reviews. Barasch and Berger did an examination of social transmission behavior while there is the broadcasting of consumers through various social media positing such as Facebook or Twitter social Medias and found that people would share information changes their final perception such as looking bad while broadcasting but instead would share information that is of good use to the receivers when narrowing (Correa, 2012).

Conclusion

Digital platforms make it possible for the most current business operations to prevail. It can hence be deduced that, for any business to be on the safe side, it should let its paradigm shifted toward what is of great benefit and hence can be converted match the current standards of marketing. Social media and online websites together with the search engines would turn an organization to a benevolent benefit if well utilized.

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Impact Of Gst On Handloom Sector In India

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Abstract : *GST is an indirect tax regime levied in India on the sale of goods and services. This GST replaces a number of central and sales tax and the impact on handloom industry is quite significant. In India, textile sector today comprises of four important segments as follows modern textile mills, independent power looms, handlooms and the garment sector. Handloom weavers are known for their knowledge, innovation and brilliance in design. The current impact of GST on Handloom Industry is negative, considering the fact that it is the second largest textile industry in the world after China. "Textile industry contributes around 4% of GDP, 9% of excise collections, 18% of employment in industrial sector and has 16% share in the country's export. India contributes for 12% of the world's production of textile fibers and yarn".*

Key Words: *GST, Indirect tax, Handloom Industry, Textile.*

1.1. Introduction:

The Goods and Services Tax (GST) is a value-added tax levied on the goods and services sold for domestic consumption. The GST is the tax paid by consumers, but it is collected by the government from the businesses selling the goods and services. In return, GST provides revenue for the government. It is referred as Value-Added Tax (VAT) in some countries. The main objective of implementing the GST is to eliminate tax on tax i.e. double taxation which cascades from the manufacturing level to the consumption level and to bring in transparency in the economy. Basically, GST is an indirect tax that imposes taxes on the goods and services, manufacture, sale and consumption of goods and services, under a single domain at the national level.

The impact of GST on the textile sector is quite significant as this industry provides employment to maximum people in India about 35 million people which is the second highest after the agrarian sector. GST will fundamentally change the way the textile sector is presently taxed in India.

1.1.1. Classification of Indian Textile Industry:

The textile industry can be broadly classified into two categories, they are as follow:

1. Organized sector

A) Spinning mills or composite mills

2. Unorganized decentralized sector

A) Power loom segment

B) Handloom segment

c) Hosiery segment

D) Khadi & Carpet manufacturing segment

1.1.2. Handloom sector:

Indian handloom is a part of India's heritage and its genius is known to the world through its handspun cloth. Indian handloom sector of the textile industry is ancient and has served the economy well in terms of employment providing direct and indirect employment to more than 45 lakh weavers & contributes nearly 23 % of total cloth production.

Handloom industry is the largest cottage industry in the country and uses agricultural products as raw materials and, therefore, provides an ever-ready market for agricultural produce. In the Indian economy majority of people rely on agrarian sector for their livelihood, hence the significance of handloom is well understood. It also gives employment to a lot of women and, thus, plays its role in women empowerment.

The per capita purchase of cotton textiles in handloom sector is 0.88 metres and aggregate consumption at all India level is estimated to be 989 million metres. National level consumption of pure silk textiles produced on handlooms was 116 million metres and 6 million metres in woollen in 2006. Handloom fabric production reached 6.9 billion square metres in 2011-12.

The GST rates for textile products and handlooms are majorly divided into:-

- Tax-Free textile goods
- 5% GST (fibers & yarns)
- 5% GST with no refund of ITC accumulation-apart from this, there are also textile materials, tyre cord fabric, woven fabric & rubbers thread etc., which are charged with 12% GST. But whereas, the tax-free textile goods will be more clean, the basic raw materials like raw silk, coconut fibers, coir, wool, jute-fibers raw which are processed but not spun.

As this sector, is considered one of the major in India right after agriculture, a moderate rate was announced for the cotton sector & several other natural fibers.

1.2. Review of Literature:

1. Dr. R. Vasanthagopal (2011) studied, "GST in India: A Big Leap in the Indirect Taxation System". He concluded that the new tax regime i.e. GST will take some time to get into the minds of the public because the present tax system is already so

much embedded in the minds of the people & he stated that the GST is the step towards positivity from that of current indirect tax system.

2. Government of India-Ministry of textiles (2015) have given a note on handloom sector. It has dealt with clear explanation of how the Steering Committee constituted under the Chairmanship of Secretary(Textiles) in the meeting held has decided that the major stakeholder of the handloom industry i.e. National Handloom Corporation will take up its role and give the guidance to the subsidiary companies which will be set up in the centre.

3. Tanushree Gupta (2016)-APS Rewa University, India has done a research work on Impact of GST on organized & unorganized sector. This study examines the implications of GST on the textile industry while a clear analysis of it's estimates of the revenue rates for the relevant textile segments under the GST. She have also given a clear view of the subsidies which are given by the government & the relating supporting policies will have an impact on GST.

1.3. Objectives:

1. To study the impact of GST on handloom industries.
2. To study the changes made by the industry due to the implementation on GST.

1.4. Importance of the study:

The study makes an analysis of how the new tax regime "GOODS AND SERVICE TAX" is creating its impact in particular sector called Handloom sector. And apart from it by this study we can understand the changes made by the industry and how well the public is in par with those laws.

So this is important to be made for the present scenario to understand well about "GST" and its implications.

1.5. Need for the study:

The review of literature revealed that very few studies are made on the topic "Impact of GST on handloom sector covering all the aspects of knowledge, involvement of public, interventions by the government and the change within the rules and regulations.

So there is a need for the comprehensive study like the present one.

1.6. Research Methodology:

The study is based on primary data generated by administering a questionnaire to the respondents residing in the city Hyderabad.

1.6.1. Analysis and Presentation of data:

The data obtained is analyzed with the help of simple percentages and presented in the form of pie charts.

1.6.2. The sample:

The sampling method adopted is the convenience sampling method.

1.7. Sources of Data

As explained earlier, the study is mainly based on primary data generated with the help of questionnaire using google docs. This is supplement by secondary data from various sources such as internet and already published papers.

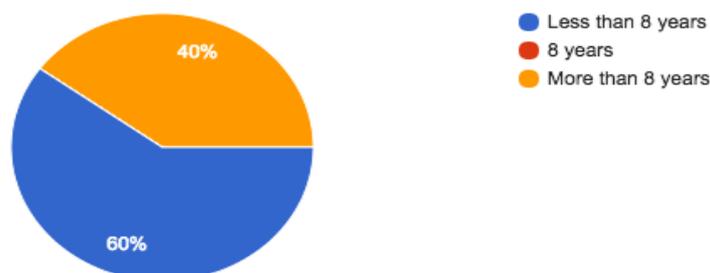
1.8. Limitations of the study:

1. The number of respondents are limited because of lack of time.
2. Greater number of respondents must have thrown a greater light on the study.
3. No tests of sampling and statistical tools are used because of short period of time.

1.9. Interpretation:

1. How long has your company been in the business?

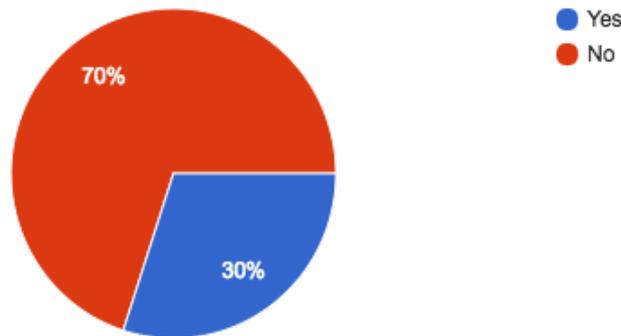
10 responses



The major percentage of respondents (60%) business in handloom sector is not more than 8 years that they have commenced their business.

2. Does your company do online business?

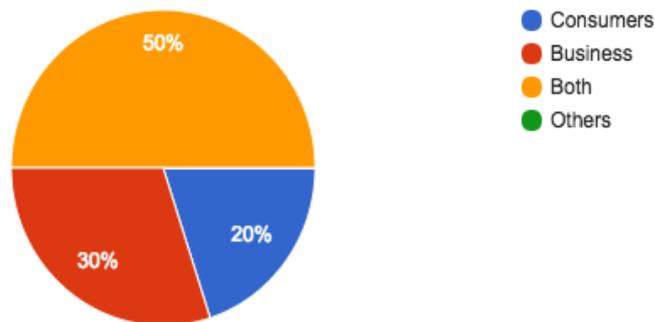
10 responses



In the above question we find that 70% of the respondents are not using online platform for their business as we still find handloom sector lagging behind with proper resources and knowledge about digital market and digital payments.

3. Does your company serve consumers, businesses or both?

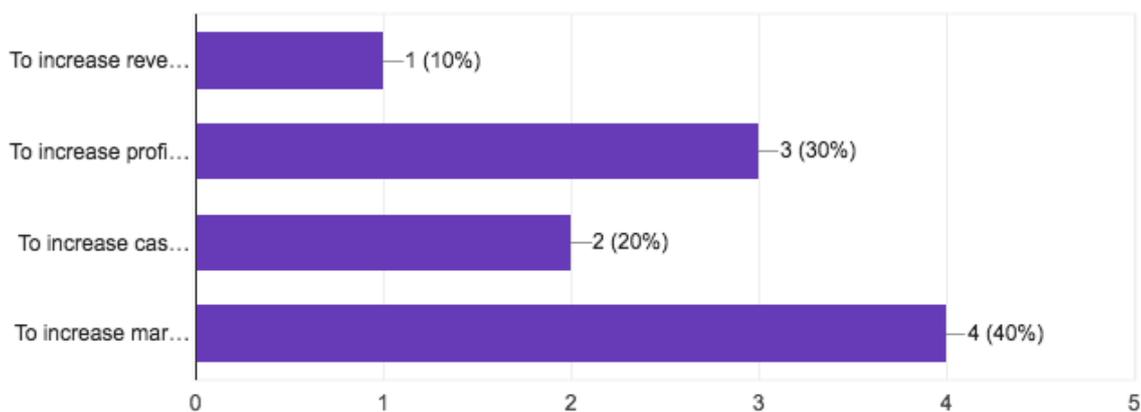
10 responses



In the above context the first priority when it comes to service provider or service receiver who serve only for consumers or business or both it is clear that the major market (50%) is showing their keen interest to act as a supplier as well as a retailer.

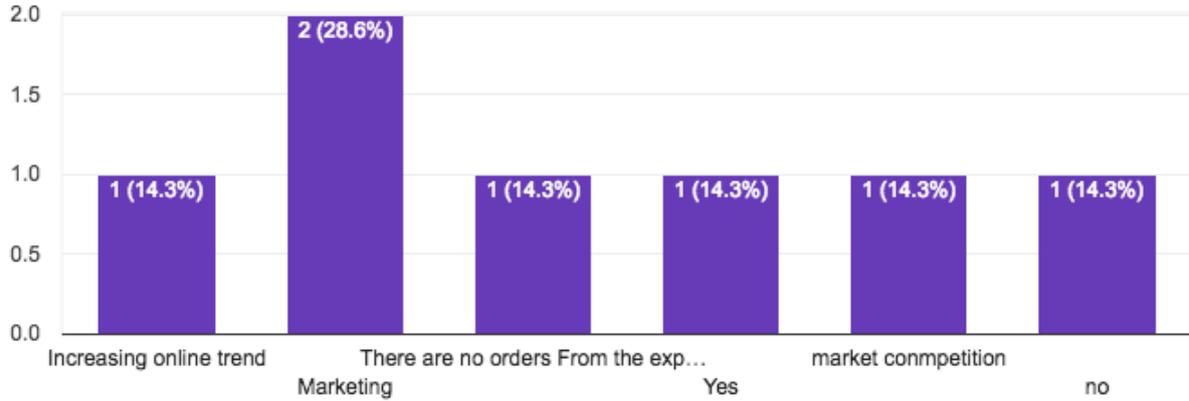
4. In the next three years, what is the most important aim for your company? Pick any 3

10 responses



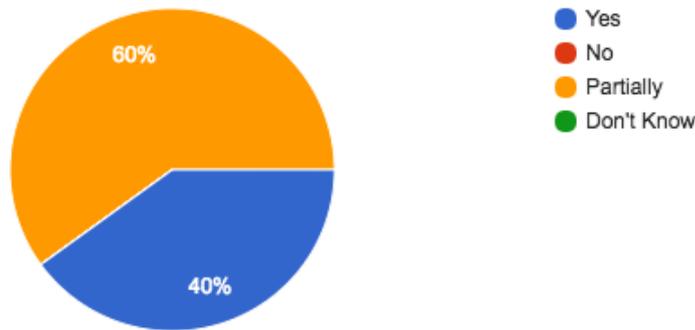
5. What factor(s) are the most challenging for your company presently in meeting with its revenue target?

7 responses



6. Are you aware of what GST is all about and its laws & different slab rates?

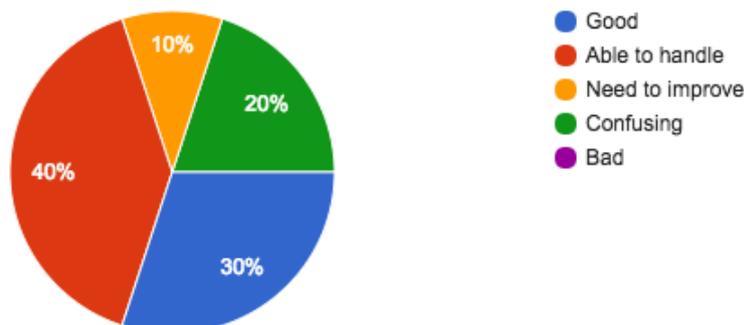
10 responses



As the laws related to GST are recently introduced into the country and still people are not completely acquainted with the whole of the regime, we find partial knowledge among the respondents related to GST and its laws and different slab rates.

7. How are you dealing with the implementation of GST?

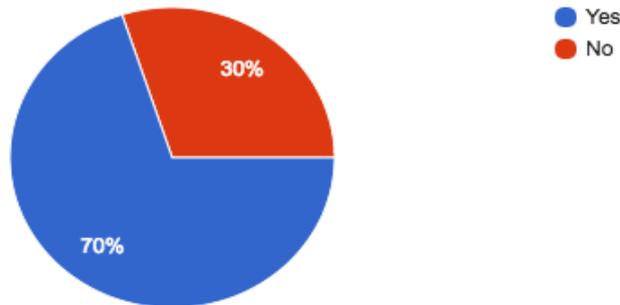
10 responses



The new concept which is above the past tax structure is still not functioning smoothly. So 40% of the respondents are managing and are in a position to handle, where 20%+10% are still confused as to how they should proceed with the new laws and changes.

8. Did the implementation of GST has cause a rise in the price of your goods?

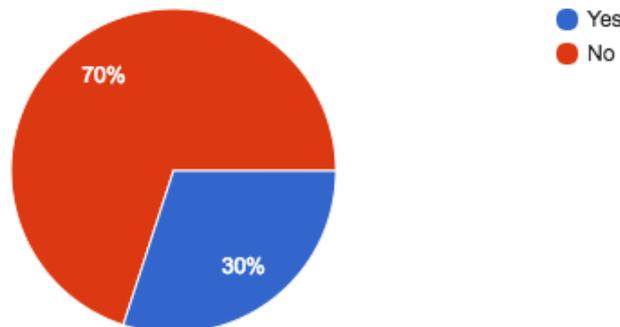
10 responses



The above data depicts us that in the present scenario because of GST there is a rise in the price of the goods (70%). This implies that it is creating a negative impact on view with the ultimate consumers.

9. Has GST hampered the rate of profitability of your company?

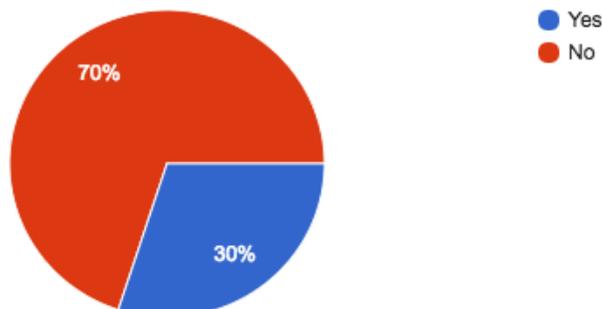
10 responses



It is obvious to know that the enhancement in rate of profitability of the business will be very low (70%) because still we find the business men are not completely educated about the changes made.

10. Do you feel GST slab rates are reasonable compared to CST?

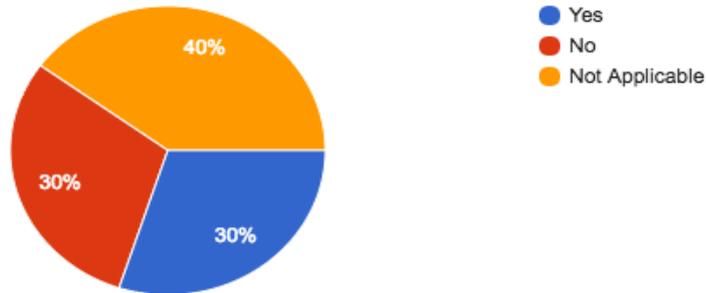
10 responses



Major respondents (70%) doesn't feel that the slab rates framed under GST are comparatively better to Central sales tax.

11. Do you see a rise in the demand for your services by clients after the GST implication?

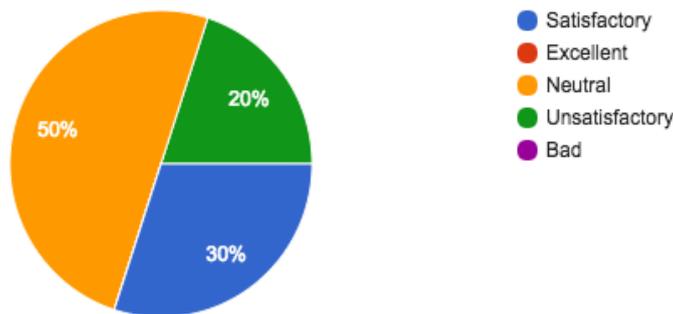
10 responses



It is observed that, the demand for the services of the respondents have been equally increased for few and decreased for few i.e. 30% and majority(40%) felt this question is invalid due to the frequent changes in the rates of the GST which was initially very high and then fell down to NIL.

12. What has been the turnover of the company after implementation of GST when compared to CST?

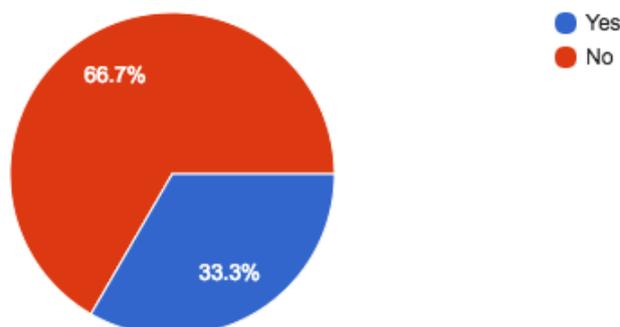
10 responses



Majority of respondents (50%) felt the turnover of the company was neutral & few(30%) satisfactory whereas, few (20%) unsatisfactory because of GST rates hampering the sales with higher rate of tax.

14. Did GST increase the working capital of the company?

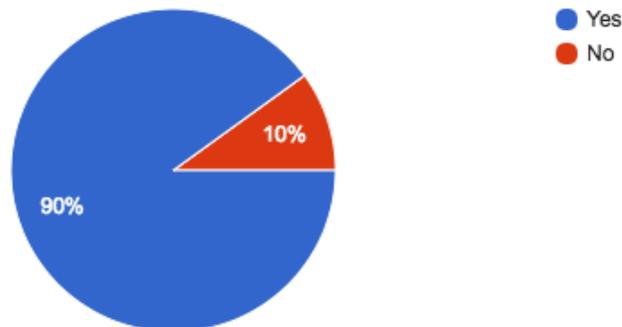
9 responses



From the respondents, the results show that there are no much of expenses incurred by the weavers (66.7%).

15. Do you think GST is a fair taxation policy?

10 responses



Public at large feel that GST is a fair taxation policy because this bring transparency in the economy and beneficial for long-run which removes the cascading effect.

1.10. Findings & Conclusions:

2. GST presently has a negative impact and the major factors effecting after implementation of GST are reduction in sales, impact on stock import & exports, increase in price levels, decrease in the demand for exports etc.,
3. GST is a fair taxation policy promoting transparency and removing the cascading effect through single taxation system.
4. Majority of handloom businesses are still not into digital marketing because of lack of education.

1.11. Suggestions & Recommendations:

2. A clear view of GST and its laws must be clearly given to the public so that they can get educated with that particular law.
3. A proper definition of Handlooms and all the products covered under the act must be given and propagated as handloom sector employees second highest right after agriculture sector.
4. GST is a fair taxation policy but there must be some relief to the weavers as they cover most of the unorganized sector working.

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Digital Technology(ICT) in Education: A Study

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Abstract: *This article discusses the Roles of ICT in education. Information communication technologies (ICT) at present are influencing every aspect of human life. They are playing salient roles in work places, business, education, and entertainment. Moreover, many people recognize ICTs as catalysts for change; change in working conditions, handling and exchanging information, teaching methods, learning approaches, scientific research, and in accessing information. This article also deals with two current trends in Educational Technology: distributed learning and electronic databases. Results indicated in this paper include: (1) distributed learning as a means of professional development; (2) emergence of blended learning and knowledge management as educational fields; (3) usage of distributed learning for educational purposes within other fields; (4) electronic databases and their effect on education; (5) distributed learning for content visualization; (6) issues in the implementation of educational technology; (7) future trends in distributed learning and electronic databases; (8) classroom applications of each technology; (9) future recommendations for the use of distributed learning and electronic databases. Further development and use of educational technology for both teachers and students should be pursued as a worthwhile investment for educational achievement.*

Key Words: DT, ICT

Technology can aid in educational achievement through two primary methods: the removal of physical barriers to learning and the transition of focus from the retention of knowledge to its utilization. Each of these methods must be examined in the context of their relation to both the student and the teacher in order to see their value and effect in educational settings. The removal of physical barriers has allowed teachers greater accessibility in regards to professional development and graduate education. Before the age of the internet and the advent of distance learning, engaging in a learning community, such as a workplace network or a school, required a close degree of physical proximity amongst community members. Presently, there are multiple examples of the use of distributed learning technology in the educational field. First, many graduate schools have begun transitioning into programs that allow for distance education. No longer is it a necessity that teachers have geographical proximity to a university in order to pursue higher education and certification. This trend towards online classes and educational opportunities has even become so prevalent that there are universities which consist of only online classes, allowing a teacher to complete an entire course of study through distance learning (Dempsey & Van Eck, 2007). Second, the use of distance learning is not limited to the university setting, but also found in school site, district, and state levels of professional development for teachers, with the emergence of web-based conferences and seminars.

In addition, internet based technology allows for teachers to form their own learning communities that are not confined to the local school site. For example, science teachers may use a wiki or content delivery system to network and share information with teachers at other schools both within and beyond their local school district. Even more exciting, is the premise that teachers can not only receive information and training from a central authority, such as district or state personnel, but that teachers may develop content and share their information amongst their peers. This leads to situations of reciprocal teaching and mentorship that are part of a larger informal learning community. In terms of design, online learning communities allow for a multitude discussions and socialization that adhere to a constructivist learning principle, in which people effectively learn information when experiencing and defining knowledge through social contexts (Dempsey & Van Eck, 2007). Second, the use of distance learning is not limited to the university setting, but also found in school site, district, and state levels of professional development for teachers, with the emergence of web-based conferences and seminars. In addition, internet based technology allows for teachers to form their own learning communities that are not confined to the local school site. For example, science teachers may use a wiki or content delivery system to network and share information with teachers at other schools both within and beyond their local school district. Even more exciting, is the premise that teachers can not only receive information and training from a central authority, such as district or state personnel, but that teachers may develop content and share their information amongst their peers. This leads to situations of reciprocal teaching and mentorship that are part of a larger informal learning community.

Students also benefit from the removal of physical barriers through distance learning technology. In contrast with their teachers, who are focused on professional development related to their job performance, students are often learning new content and that content is often removed from their daily lives. This separation between the content being disseminated and the students' daily interactions and prior knowledge is even more prevalent in lower grade levels. For example, students may learn the math necessary to balance a budget, before they even get their own checking account or have a checkbook. However, technology can assist students in the visualization of previously unfamiliar content in a manner which assists in learning. For example, multimedia presentations, which utilize multiple formats of media, such as images, narration, and text, can be used to assist students in concept visualization. Other formats, such as simulations and games can add an extra level of interactivity between the student and the content, which turns the educational process

from a passive to an active process. Proponents of multimedia adhere to a cognitive learning philosophy and view the primary advantage to multimedia learning as the usage of multiple learning channels, under the assumption that any one sensory channel can only process a limited amount of information at once (Driscoll, 2007).

Even more beneficial is the use of educational technology, in particular multimedia and simulations, to remove physical barriers such as location and financial limitations. For example, students can view images, which may even consist of videos, of distant landmarks and geographical locations, in lieu of physically traveling to the site. While it may be unfeasible to arrange a field trip for even a few students, all students with access to the internet can use three dimensional and geographic programs to figuratively walk through a distant area. The cost of this aforementioned geographical technology is one of its great advantages, as this technology can be readily accessed for no cost through technology provided by the corporation Google and their web based map tools.

Besides the visualization of content in which they have low prior knowledge, students can also benefit from distance learning, much like their counterparts in the teaching profession. Technology can be used for classes to communicate with other school sites and/or allow multiple classes to attend hosted web conferences and seminars. For example, students studying other cultures may have the opportunity to directly speak with individuals of another nation. Thus by removing physical barriers such as financial costs and geographical restraints, technology can allow more opportunities for both teachers and students to participate in learning scenarios or to explore content on a level that is inaccessible within their immediate environment. By not only increasing the amount of learning opportunities, but by providing even more enriching learning opportunities through simulation and multimedia we can increase the assimilation of knowledge. The second impact of technology is one with long lasting effects on the future of education. Technology, through the development of searchable databases that are now even accessible on remote handheld devices, will change the way we define learning objectives. Specifically there is a transition from the memorizing and recitation of facts and information to the utilization of skills and the development of skills that allow for improved research and the evaluation of other sources, such as online databases. The mass collection of knowledge leads to an evolving technological field known as knowledge management. Rosenberg (2007) defines knowledge management as “the creation, archiving, and sharing of valued information, expertise, and insight within and across communities of people and organizations with similar interests and needs, the goal of which is to build competitive advantage”(p.157). Knowledge management is the basis for an instructional method known as blended learning, where individuals are taught within traditional means such as the classroom, but also through technological means (Rosenberg, 2007). As we develop a greater reliance on technology and the advantages that come with its usage, we can expect traditional learning for both students and teachers, to achieve a blended status, with increased reliance on technological repositories of knowledge.

For teachers, technology, in accordance with knowledge management principles, can be used to develop databases that will alter professional development. One emerging database technology is known as the electronic performance support system (EPSS). An EPSS provides professional development and job related assistance whenever an individual may need such information (McKay & Wagner, 2007). An EPSS goes beyond the simple information storage functions of a database, and can also provide case studies, templates, and situational examples for use by the individuals (McKay & Wagner, 2007). For example, if a teacher has a question on how to write lesson plans in accordance with school district requirements, they could go to an EPSS provided by the district and find instructions and information on how to perform their task. This support system allows the teacher to receive help in a very time efficient manner, as the teacher is not required to find an individual who has the specific knowledge and the time required to instruct the teacher. In addition, the higher the sponsor of the EPSS, such as a federal government sponsored EPSS, the greater the numbers of individuals that can be served by a single database and adhere to the same standards of job performance. With the increasing prevalence of the EPSS and other such information databases that are focused on job performance, professional development will undoubtedly be changed. With information being readily available, there would be little need to mandate professional development that is primarily focused on content delivery. Cost saving methods can be utilized when a professional development activity, such as the delivery of new standards, laws, rules, or procedures, can be placed into an electronic database and a memorandum be sent regarding the updated information in lieu of the time and financial costs of requiring personnel to attend an off- site meeting. Ideally, online databases can be used to assist teachers with professional development that is primarily based on skill usage derived from content knowledge. Given that there is only so much time that is able to be devoted to professional development, this focus on the use of knowledge rather than simply its obtainment will ultimately increase the effectiveness of professional development sessions. With more time effective professional development and the ability for teachers to quickly receive job assistance, technology can increase student achievement through the development of a highly skilled teacher.

In terms of databases and their direct impact on students, changes can be expected, as educational standards begin to focus less on the memorization of knowledge, but more on how to find and evaluate knowledge. For example, an assignment that has students recite definitions from memory on an assessment could instead have students choose the correct definition for a certain context from an electronic source which may contain multiple definitions. Students may also be asked to perform tasks that require a high level of skill, such as setting up and running a complex experiment, by utilizing support from a database to assist in the process. Thus, content leaders can develop highly complex tasks for students, knowing that the students have information available to assist them if needed. These types of activities are much

more realistic, as outside of school, individuals such as engineers are not faulted if they need to reference a statistic or mathematical constant from a database. Given how expansive the world's knowledge has become, we as educators should not lead our students into inefficient endeavors aimed at creating human databases, but teach students the skills to utilize existing knowledge in their learning tasks.

Thus in regards to the effect of technology on the field of education, technology will continue to have an impact, in terms of both how we train our teachers and how those teachers instruct their students. Specifically, technology can remove physical barriers to learning, such as geographic proximity and financial costs, through technology that facilitates distance learning. In addition, the increasing prevalence of databases can be used for job performance assistance as well as changing the way we teach students, giving a new focus on skill based performance over knowledge retention.

In Watson's (2001) description, ICTs have revolutionized the way people work today and are now transforming education systems. As a result, if schools train children in yesterday's skills and technologies they may not be effective and fit in tomorrow's world. This is a sufficient reason for ICTs to win global recognition and attention. For instance, ICTs are dependable tools in facilitating the attainment of one of the Millennium Development Goals (MDGs), which is achievement of universal primary education by the year 2015. Kofi Anan, the former United Nations Secretary General, points out that in order to attain the goal of Universal Primary Education by the year 2015; we must ensure that information and communication technologies (ICTs) unlock the door of education systems. This indicates the growing demand and increasingly important place that (ICTs) could receive in education. Since ICTs provide greater opportunity for students and teachers to adjust learning and teaching to individual needs, society is, forcing schools to give appropriate response to this technical innovation. As further evidence of the educational effectiveness of technology implementation, other fields have adopted technology for their own educational and training programs. Corporations are integrating their training sessions with technology. The military has served a large role in advancing distance learning technology and delivering training to those far removed from the classroom setting. The healthcare field is using technology to prepare doctors for a future in an age of excessive information, where skills related to research and knowledge application are valued at a higher level. Each successful implementation of educational technology into other fields only serves the argument for integrating technology at every level of the traditional educational process. If technology is successful in assisting the continued development of our doctors, soldiers, and business leaders then it is certainly able to assist the development of more effective teachers and more skilled and knowledgeable students.

Thus from examining the present usage of technology, both within the educational field and in other fields, we arrive at a need for future recommendations. In regards to future action, we should continue to utilize the successful trends in education as a means to fulfill their developmental potential and see increased impacts on our field. In particular, we should continue the use of distance learning as a means of professional development for teachers, by providing more opportunities aimed at improving their job related performance. Distance learning for students should also be an area of focus by providing software that allows for increasing authenticity in simulations, multimedia content, and social connections. We should continue to focus on technology that allows students to interact with other students and environments located outside of their current environment, locality, and culture. Information systems are also in need of continual investment. Information systems perform two important roles for the educational system: performance support for teachers and knowledge support for students. Given the large amounts of information and continuing focus on problem based learning and assessment, an increased reliance on information systems to assist in tasks is justified as a means of assistive technology. Through continued usage and development, information systems may be accepted on the level of calculators, a technology tool designed to remove excessive memorization and lengthy calculations.

In conclusion, technology has already served an important role in education in multiple fields. Specifically, technology has been of great use to the educational field in terms of its focus on improving the effectiveness and efficiency of the educational experiences of both students and teachers. Continued use and development of technology can serve to further benefit the educational field and recommendations based on the development of existing trends in education should be pursued for great gains in educational achievement.

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