

A Study of reinventing IT expenditure and sourcing strategies

Dr Hitesh Keserwani

Assistant Professor, Amity Business School, Amity University, Lucknow , India.

Received: January 10, 2019

Accepted: February 13, 2019

ABSTRACT: With the development of computerization, information processing has been transformed from mainframes to PC's to server-based computing to the Web. Now a days, most of the organizations are sincerely considering adoption of cloud computing, the next major target in technology development and business integration and tie-ups. Cloud computing is hosted service from managed service provider's, which enables industry & enterprise businesses to focus on their key objectives, it relieves them of forming information technology strategy, and takes care to fulfill their infrastructure, platform and application requirements, delivering quality service level agreements to their employees for better efficiency & productivity. By migrating to the cloud, business organizations will be able to cut down IT expenditure for reinvestment in mission-enabling works or achieving organizational objectives, such as minimization in scarcity of resources. With more responsive systems and quicker deployment times, they will be more efficient in supporting core business activities and facilitating customers in a better way. However to one side not just the benefits but there are also various challenges that must be dealt with to achieve the main objective of deploying cloud computing. In today's scenario the investment in various tools, techniques, and processes required to overcome the obstruction to cloud resettlement is likely to generate a significant return in the long term. Organizations that pursue a laid down process to develop a business-oriented sourcing strategy are more likely to attain the expected cost, efficiency and organizational objectives, and also take benefits of opportunities for modernization and reduced-cost information technology from outsourcing, as per Gartner, Inc. The sourcing strategy process is multifaceted and repeated in nature, involving many steps, each with deliverables. As an output, effective implementation of the sourcing strategy phase incurred cost in setting up processes, people and tools. The paper highlights the key deliverables that suggests the direction to minimize various risks and cost associated in the sourcing cycle and subsequently suggests the ways to select appropriate providers, and negotiate for a sound contract and effective deal.

Key Words: Information technology, TCO, Computing, ROI, IT Strategies

INTRODUCTION

Cloud computing is a new way of computing over the web. The word cloud is a symbol for Internet. It is a new approach to deliver of IT services over the web. Cloud computing is a simplified term for anything that includes deploying hosted services over the web. It is the utilization of computing resources (hardware, software and network) that are offered as a service over the internet. The name has been derived from the usage of a cloud-structure symbol as a concept for the multifaceted infrastructure that contains in system diagrams. Cloud computing commends remote services with data, software and high end computation. With the speedy development of processing and storage infrastructure and the increasing use of the Internet, computing resources have become affordable, more robust and available all over the world than ever before. This technological arena has have made possible the realization of a new computing power called cloud computing, in which computation capabilities (e.g., CPU and storage) are made available as general utilities that can be rented and released by users through the Internet as per their demand pattern. In a cloud computing infrastructure, the conventional role of service provider is categorised into two: the hardware/software providers who administer cloud platforms and rent resources according to a usage-based pricing model, and service providers, who rent resources from multiple infrastructure providers to serve the end users. The introduction of cloud computing has made a remarkable impact on the Information Technology (IT) industry in recent years, where large companies such as Google, Apple, and Amazon including Microsoft struggle to provide more robust, trustworthy and cost-effective cloud platforms, and business corporations seek to realign their business models to achieve benefit from this new transformation.

Objective of the research/case

- To eliminate the misconceptions in outsourcing and removal of confusion among entrepreneurs in using wide-ranging services with higher cost.

- The idea is to make them realize the real potential of outsourcing where businesses focal point in what they do, while outsourcing experts can work on the day-to-day of aligning software and managing the dynamic IT infrastructure.
- To make the best utilization of technology investments and of outsourcing prospects for small- and mid-sized business holders and show them a clear picture at where they can free themselves from the external assistance and can save a huge cost of hiring consultants.

Current state of the research area

In today's economic scenario, while companies are struggling with dynamic market scenario and ever-imposing regulations, Business owners are dealing with a pressure of increased expectations in business efficiency along with reduction in IT budgeting. Business owners are facing tremendous pressure to deploy cost-effective strategies that increases business efficiency i.e. to achieve high with less. With the adoption of cloud computing strategies it is expected that it will open up new vistas and will increase business boundaries.

In current scenario when there is a need for huge IT investments with increasing operating cost. The cheaper access of cloud computing solutions have made it possible through the use of a virtual outsourcing environment, and have attracted the majority of business to the Cloud. The Cloud facilitates with a robust business model which is flexible and suitable for different types of businesses. This is why the Cloud is a gripping even for those industries which were not traditionally using IT to operate its core business activities such as the Government departments.

The cloud is a new business model for Facebook and Twitter too, as well as IT powerhouses such as IBM and Microsoft. Instead of buying hardware and developing applications, companies can now access software and infrastructure-based cloud services on a pay-as-you-go basis from Google, Sales force and Canadian providers such as TELUS and Bell. What makes cloud services unique is that it introduces best-in-class technologies and processes that, in the past, have been cost prohibitive to an entire class of businesses. With the cloud, these investments are primarily designed for the benefit of all companies. The cloud not just lowers but eliminates barriers to entry for enterprise-class IT services. This has tangential business benefits for the companies to become more agile, cost-effective and ultimately more competitive over time.

CLOUD COMPUTING ARCHITECHTURE

In a general terminology, the construction of a cloud computing atmosphere can be divided into four layers: first hardware data centre layer, second infrastructure layer, third platform layer and forth application layer.

The platform layer: placed on top of the infrastructure layer, the platform layer comprising of operating systems and application framework. The objective of the platform layer is to reduce the load of arranging applications immediate into VM containers.

The application layer: To the top level of the hierarchy, the application layer comprises of the real cloud applications unlike from conventional applications, cloud applications can facilitate the automatic-scaling option to achieve increased performance, availability and reduced operating cost.

As compared to conventional service hosting atmosphere such as dedicated server farms, the techniques of cloud computing is more robust. Each layer is loosely coupled with the layers up and down, allowing each layer to develop independently.

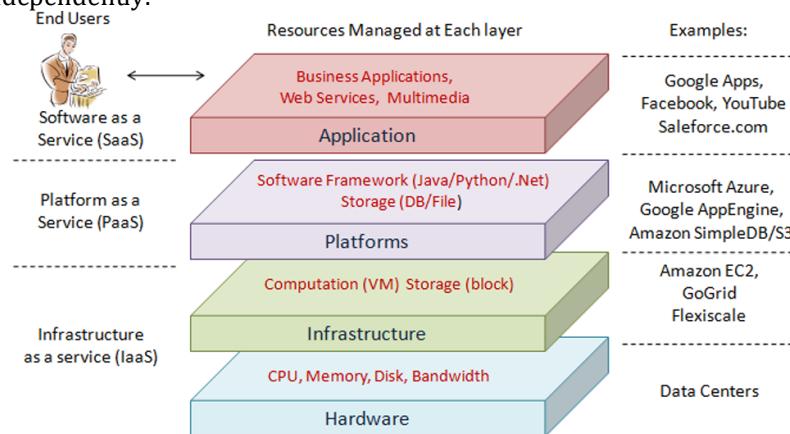


Figure: 1 Cloud Computing Framework

CLOUD COMPUTING SERVICE MODULES

Infrastructure as a server (IaaS)

In a cloud service model, cloud service facilitator provides computers, as physical or more often as virtual computers, and other essential computation capabilities. The virtual machines are executes as outsider by a hypervisor. Management of group of hypervisors by the cloud operational support system develops the ability to scale to facilitate a huge number of virtual machines. Other resources in Internet as a service clouds uses images to a virtual machine image library, blocks and file-based storage, firewalls checks including IP addresses, and virtual local area networks (VLANs), and also variety of software's.

Platform as a service (PaaS)

Talking about PaaS model, cloud providers provides a computing platform usually including OS, various programming languages, multiple databases, and web servers. Software developers can create and execute their software products on a cloud platform without investing any cost and worrying of purchasing and managing the required hardware and software components. Some of the PaaS offers, the fundamental computer and storage functionalities which automatically matches application requirement. For example cloud user do not need to allocate resources manually. Examples of PaaS include: Amazon Google App Engine, and Microsoft Azure

Software as a service (SaaS)

In SaaS model, cloud facilitators configure and execute application software packages in the cloud platform and cloud user's retrieves the software packages from cloud clients. The cloud users need not manage the cloud framework and platform under which the application is executing. This eradicates the requirement to install and execute the application on the cloud user's own terminals simplifying maintenance and technical support. The basic difference between cloud applications and other applications is its elasticity. This can be done by developing replica into multiple virtual machines at run-time to meet the varying user demands.

Break up of Cloud Service Elements

Cloud computing technology has been widely accepted and appreciated by the companies, still few are not very willing to shift from internally owned and established IT systems to cloud computing functionalities due to the threat of security and theft or losing the control over their company's systems and data. With its increasing popularity, a huge amount of firms have started facilitating with such service.

Across the world the market for cloud services is expected to increase from \$46.4 billion in 2017 to reach \$150.1 billion in 2018 with a CAGR of 26.5%. Out of different cloud services, business process services have individually contributed 84% of the total revenue generated in 2016.

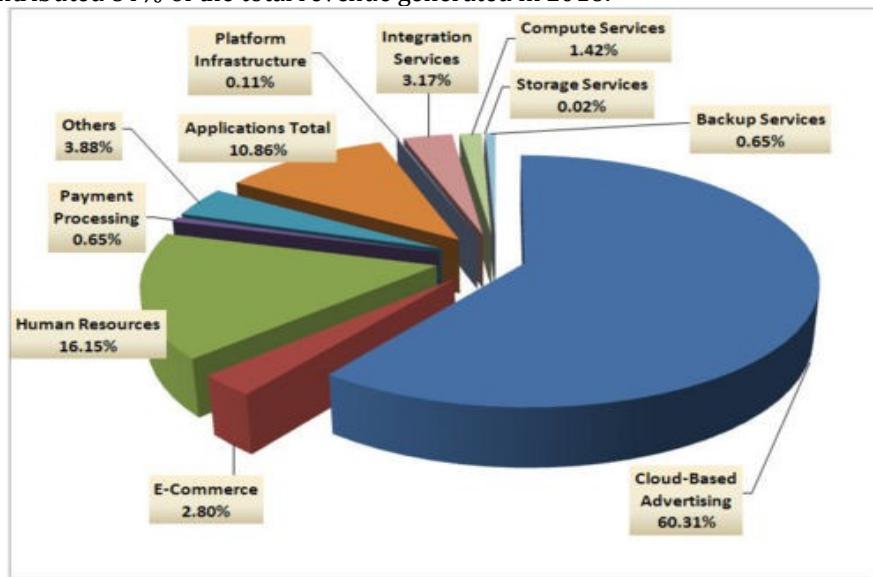


Figure 2: Break up of Cloud Service Elements

CURRENT STANDING

Cloud computing spend to touch \$150bn by 2018.

According to IDC, the IT spending across the world on cloud services will increase almost three times, reaching US\$150 billion, by 2018. The cloud computing solutions offers a much reduced way for businesses to obtain and use information technology, IDC believes its acceptance to be augmented by the reduced cost of most organizations today.

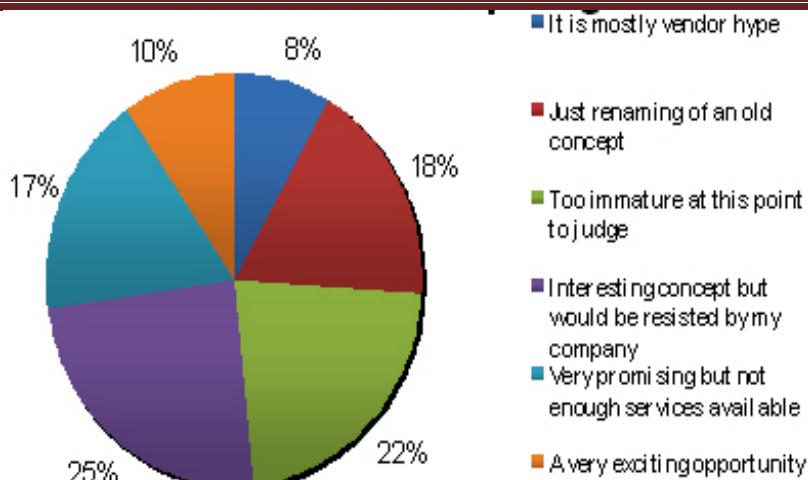


Figure 3: Current standing of cloud Infrastructure

TOP five (Platform as a Service) providers:

- 1: Amazon web services: Programmer upload the app and Elastic Beanstalk manages the usage details, capability provisioning, load balancing, automatic-scaling and app performance monitoring.
- 2: Appistry : This platform facilitates developers to deliver scalable, trustworthy and low maintenance applications on public, private and hybrid cloud mechanism. This app aims on reducing app supply time by 60 percent, with increased management effectiveness by 20 times and reducing costs by 80 percent.
- 3: App Scale: This platform facilitates programme developers the strength to deploy and analyse their app engine applications in an open-source situation by providing capability to debug and profile applications as desired.
- 4: CA Technologies: It allows users to turn an apps and the infrastructure facilitates it into a single identified object called a business virtual service.
- 5: Engine Yard: Engine Yard's platform is offering a simplified, automated Rails consumption which makes easier app migration during computation process.

KEY DRIVERS OF CLOUD COMPUTING

- Increased competition and down trending economy pushing companies to reduce fixed cost.
- Lesser funding opportunities for start up companies have made it necessary for them to find a way to reduce infrastructure cost.
- More focus on reduce execution time.
- Increased requirement to store and retrieve real time data instantaneously.
- Rapid increase in volume of business data giving boost to storage requirements.

ADVANTAGES OF CLOUD COMPUTING

Cost Effective

With the help of cloud computing users are able to save their time and money as compared to using complicated stand alone servers. It is an economical way to maintain software as the software developer is able to update and maintain programs while it is being used by the users, thus saving time. The need for replacing capital expenditure is also minimised. Moreover cloud resources such as centralised, real estate, bandwidth and power find it economical. The users will be able to save money on costs levied on management and data storage or software updating activities.

Speed & Scales: The cloud computing method discards the need for purchasing and setting up hardware manually. User can scale up or scale down easily as and when required.

Innovation: As the manual management is no more required the user can focus on innovation process. Cloud computing helps in swift development of prototypes and test phases. The biggest advantage is to the users who have to keep an eye over projects on regular basis.

Convenient: the convenience of cloud computing can be felt while sharing the infrastructure as the services are available at low overheads. The billing of services is done for the time it is utilised. One can easily cross check the bill cost as it is provided online by the service provider.

Location: due to cloud computing the regions having lower overheads use the service and take advantages of the benefits also. Moreover various different websites are established at the time of disaster recovery and thus cut costs.

Multiple Users at one time: it can be said that not only Cloud computing is cost effective but also reduces global wastes. Its environmental friendly aspect can not be ignored as is used by multiple users. The down time is reduced to half while the resources are being stretched.

Flexible: the flexibility of cloud computing can be confirmed by the feature of opting out of it whenever the user wants to. This feature is making it the most loved method. In this case the service level agreement covers the cost. The penalty cost has to be paid in case quality is not up to the mark.

Device Diversity: another feature of cloud computing is the access through other electronic devices. The devices like iPad, laptop, smartphones, desktops only need to be connected to the internet.

Lots of Storage Space: cloud services combined with internet provide lots of space to store files and data.

LIMITATIONS OF CLOUD COMPUTING

Network connection

The cloud computing relies on internet. If client has connectivity problem the concept is bound to suffer. Thus performance of cloud application is directly related to performance of network at clients' end. Also the upload and download speeds cannot match the high speed of local servers.

Control of data security

Data security is a basic problem in public cloud. As the client doesn't have any control the data is prone to hacking or phishing. Moreover due to interconnected servers malware is easy to spread.

An additional cost

It seems that cloud computing is economical but it carries some hidden costs as clients have to pay extra amount for data transfer and various services. Initially the service is offered at higher price so that with time economies of scale occur.

Possible downtime:

Cloud application is completely dependent upon internet. So business is dependent upon connectivity. If it's offline whole business is offline!

Peripheral:

Many peripheral devices like printers and scanners require locally installed software which might not sync with cloud. While networked peripherals pose lesser problems

Integration:

Integration of internal applications with cloud application is a complex process.

Inflexibility:

One has to be careful while choosing cloud computing service provider as no one wants to lock one's business into proprietary formats. Proper care should be taken to ensure addition or subtraction of cloud users based on business needs.

Generic

Not all organisations are comfortable with public cloud offerings which are usually very generic and provide multi-tenancy services. Even more implementing in-house cloud service would be complex and burdensome if organisation is small. Cloud service providers are well aware about the above mentioned problems and are continuously striving for solutions. Some organisations are embracing it without a second thought; some are opting for non-critical applications while others are waiting for the technology to evolve before taking any decision.

CHALLENGES

Industries now days proactively adopting cloud computing. Although, the research on cloud computing is still at a very early stage. New challenges continue to be emerging from industry applications and existing issues have been fully addressed and resolved

Automated service provisioning

Automated service provisioning is a common problem. The provisioning of resources dynamically for internet application has been an interesting area of studies in the past.

The approaches which are involved are as follows:

1. In the area of cloud computing. To achieve a satisfactory QoS performance, it is required to construct a performance model application that can find hidden pattern and number of application instances required to effectively manage the demand at a particular level.

2. Analysis of future demand periodically and accordingly. Determining the requirements of resources by using the performance model.

3. Automatically and dynamically allocating resources using the anticipated resources requirements.

Energy management

The energy management is directly related to operational cost in cloud computing. Therefore improving energy efficiency is a major issue. The estimated cost of powering and cooling accounts for 53% of the total operational expenditure of the data centre. In 2006, data centres in the US consumed more than 15% of the total energy generated in that year.

Traffic management and analysis

Proper analysis of data traffic is important for today's data centres for efficient 24*7 real time service. In order to increase efficiency, many of the management and planning decisions , network operators also need to know how traffic flows through the network. Although the traffic measurement and analysis method having several challenges which is expected to reduce in coming times through continuous R&D practices.

Data security

Data security occupies important place in research in cloud computing. It is a well known fact that service providers depend on the infrastructure providers to attain complete data security as they do not have any access to the physical security system of data centres. The service provider can only specify the security setting remotely for Virtual private cloud without confirming if it is fully implemented or not.

Novel cloud architectures

Currently, majority of the commercial clouds are employed in huge data centres and managed in a centralized fashion. however this method achieves economy-of-scale and increased manageability, but also their is a limitation of high energy expense and huge initial expenditure for developing data centres. current work discusses that small size data centres can be more beneficial than big data centres

SUGGESTIONS

Cloud computing for first must be used only if it is required. Yes there are benefits but one should also not forget the risks associated with this technology. Cloud computing should be used to that extend which can enhance your business and not backfire on your business. For companies who are providing the service should always keep in mind the risk trade off that they would have to face with profitability .Establishing a cloud service requires large amount of financial commitment and any lapse in service could cost you plenty. The problems of managing power to data centres and service centres and also cooling mechanism plays major in the cost (53%) and thus should be taken tare off well in advance . For a new company it is better to establish small data centres in different locations Because of the various benefits associated with it like low cost in cooling mechanism, easier maintenance of data centres, low energy expense etc. Companies should also be aware of the challenges face in cloud computing which are mentioned above and always be ready to face them in every circumstance.

CONCLUSION

Cloud computing is an emerging opportunity for majority of small businesses to reduce the annoying situations and costs of their IT infrastructure. Security concerns relating to their business data on the Internet seems to be a major concern for almost all the small business CEO's. Another approach could be applying cloud services gradually; a portion of business can be taken to see how it performs. The main aim should be to capitalize on this concept as much as much as keeping in mind the limitations at the same time. And the most important this never use cloud computing in your core business completely no matter what but it is what that determines your identity as well as brand and any slightest of mishap can cost your business plenty. However, cloud computing offers a wide variety of services but still it is not fulfilling all the dynamic requirements and diverse needs of business organisations. Many issues in this area, which includes automatic resource provisioning, power balancing and security concerns. Therefore, to my understanding there are still enormous opportunities for researchers to explore this area of cloud computing.

References

1. Brunette, G. & Mogull, R. (2009). Security Guidance for Critical Areas of Focus in Cloud Computing V2.1. Cloud Security Alliance. <http://www.cloudsecurityalliance.org/guidance/csaguide.v2.1.pdf>.
2. Bhargava, H. K. & Sundaresan, S. (2004). Contingent Bids in Auctions: Availability, Commitment and Pricing of Computing as Utility. Proceedings of the 37th Hawaii International Conference on System Sciences, pp. 1–10.
3. Zhang, Q., Cheng, L. & Boutaba, R. (2010). Cloud computing: state-of-the-art and research challenges. Journal of Internet Services and Applications, Vol. 1, No. 1, pp. 7–18.

4. Cloud Computing on Wikipedia, en.wikipedia.org/wiki/Cloudcomputing, 20 Dec 2009.
5. Cloud Hosting, Cloud Computing and Hybrid Infrastructure from GoGrid, <http://www.gogrid.com>
6. Dedicated Server, Managed Hosting, Web Hosting by Rackspace Hosting, <http://www.rackspace.com>
7. Ananthanarayanan R, Gupta K et al (2009) Cloud analytics: do we really need to reinvent the storage stack? In: Proc of Hot Cloud
8. Padala P, Hou K-Y et al (2009) Automated control of multiple virtualized resources. In: Proc of EuroSys