

Communication in a distributed team

Tanzila Moiz¹, Raj Shree² & R. K. Srivastava³

Research scholar, Department of IT, BBAU Lucknow¹

Assistant Professor, Department of IT, BBAU Lucknow²

Professor, Faculty of Computer & Information Technology, Dr. Shakti Misra National
Rehabilitation University, Lucknow³

Received: April 08, 2018

Accepted: May 14, 2018

ABSTRACT

In the globe, time and even organizational boundaries over the last few years distributed teams have been set up to work together, to increase the availability of limited skills, minimize travel costs, and increase worker job satisfaction through minimum relocations. This has been due to globalization, software development cycles are too short and scarce human expert resources allocating additional pressure onto project teams. Technological developments, such as various communication technologies, have helped and support the distributed teams. The communication technologies include the phone call, video conferencing and web chat, help team members to handle project tasks in a distributed team project environment. This research paper provides an analysis of the communication culture and communication tools of the distributed teams of a global IT firm. The distributed team working together in different location analyse communication behaviours and tools. The leader and member of a distributed team have gathered the advantages and disadvantages of distributed work location and technologies used via questionnaire and interviews. The variety of communication tools are available but the face to face meeting and phone calls play the important role in distributed team communication. It is also observed in the research, like non distributed team, an important need of element like common rules, shared meaning or social context are also key elements for the communications within a distributed team. create a proper understanding between distributed teams the Face-to-face meetings are still important. the distributed team is also affected by social context when we perform any complex task. The team leader complains that his resources are being misused and communication is not done properly regarding the various communication tools. The research shows, the team success, and satisfaction are totally dependent on distributed team setting and communication culture.

Keywords: distributed teams, communication technology, change management, communication culture, communication pattern.

1. Introduction

Agile practice in these days become popular in major software development companies, But still, there are many software firms not adopted Agile mainly because of managing a team that is located at different locations termed as the distributed team.

In same premises, a team can easily communicate to each other and perfectly implement the core Agile Practices and Methodologies. "The best communication is face to face, with communications occurring through facial expression, body language, fluctuation of voice and words [24].

As the project start and the team start working about its design in a group, communication becomes very exciting or passionate." Knowing that while delivering software the essential part is communication between the team especially in distributed teams (SowmyaKarunakaran 2013) [25].

But handling defects in software and managing proper assets made necessity to the software firms to adopt distributed team environment. The primary goal of the software business is to reduced development cost, skilled developers on minimum perks and incentives and to take this benefit software firms seek solutions across the national boundaries and it referred as Global Software Development (GSD) [26].

So in this research, we are focusing the challenges that distributed team faces in an Agile environment, And figure out the best practices to manage the team in this environment [27].

Distributed team:

1.1 Different Team Structure

We focus on how the distributed teamwork in an Agile environment. So we first analyze how the team works.

The distributed teams are divided into three areas.

1. Co-located
2. Distributed
3. Dispersed

Co-Located team : Co-located teams are those teams, which are sitting in the same room, same office and same building or different building but closely related to each other. Collocated teams preferred modes of communication like face to face communication decision room or war room, Scrum Board, wall display, shared table and so on[1]. In the collocated team, the interaction between the teams is formal and informal [28].

Distributed team: The distributed team members that are not in the same location when working on a project. It is an innovative way to get things done with remote talent around the world. They're helping companies of all sizes fill skills gaps, scale up quickly, and improve productivity[2]. The distributed team are spread in different cities and different countries.it is also called remote teams [29].

Disperse team: The several team members are sitting in the same building or in the same room and then the one or two team members that they are joining the rest of the team from a different location [30].

If we observe Disperse and Fully Disperse team are a kind of Distributed team. So broadly team are either Co-Located or Distributed. Below table explain the difference between the two.

Table 1.Difference between co-located and distributed teams

Co-Located	Distributed
<ul style="list-style-type: none"> The team member only work for 8-10 hours Easier to build up the team culture. 	<ul style="list-style-type: none"> With the help of timezone the team member could be available for 24 hours a day.
<ul style="list-style-type: none"> Easier to have good Collaboration and Good communication 	<ul style="list-style-type: none"> Increase the availability of talent. More diversity could be a source of new ideas
<ul style="list-style-type: none"> Less Availability of Talents 	<ul style="list-style-type: none"> Could be economically and strategically more convenient
	<ul style="list-style-type: none"> Easier to fall into individual work
	<ul style="list-style-type: none"> Misunderstanding and misinterpretations can take longer to solved
	<ul style="list-style-type: none"> More challenging to run Agile Ceremonies

1.2 Pros and Cons of Distributed Teams

The following table 2 we describe the pros and cons of a distributed team with the help of these literature reviews (Bergiel&Balsmeier 2008) and (Furumo& De Pillis2007).

Table 2.Pros and Cons of Distributed Teams

Pros	Cons
Feedback response time is minimise.	Unstructured nature of a distributed team.
You can easily find the right person for your project	Lack of experience in technology.
The team member are satisfied with their job because location changes are not much.	Network problem between communications.
Due to Timezone, distributed team can work 24 hours on project. By which the productivity of the project increases.	

2. Communication Challenges in Distributed team

Communication is an important part of the success of any distributed team. The distributed team frequently communicates with each other (Galegher & Kraut 1994). Research results show the distributed team have increased the communication pattern to the predictable level (Jarvenpaa, Knoll, & Leidner (1998) and Jarvenpaa and Leidner (1999)). Connaughton and Shuffler (2007) prove that Due face to face communication, the distributed team is constantly emerging. The identity of the distributed team is shared due to continuous communication, Because of which the interpersonal conflicts are reduced (Hinds and Mortensen (2005)) Frequent communication is a great way to share your experience with the team or easily manage the incomplete or imperfect communication. Research shows, the confidence of consistent communication distributed team increases (Jarvenpaa, Knoll, and Leidner (1998) and Jarvenpaa and Leidner (1999)).

Further conclusions are that the estimated communication with regular feedback is linked to better team performance ((Jarvenpaa & Leidner 1999); (Jarvenpaa & Leidner, Knoll 1998); (Kayworth & Leidner 2000) and (Maznevski & Chudoba 2000)). Some research paper considers essential communication in order to promote trust (Oertig & Buegri 2006), minimize work conflict (Hinds & Mortensen 2005), enhance team dynamics and in turn increase team effectiveness ((Maznevski & Chudoba 2000) and (Grosse 2002)).

2.1 Technology used for communication

It is necessary to use technology for communication in a distributed environment. Media Richness theory that is widely used to describe a communication medium, the media richness theory introduced by Richard L. Daft and Robert H. Lengel (1984 and 1986). Which can be used to describe the ability of communication medium and transfer the information. The Media Richness Theory suggests that the media differ in the level of prosperity they provide. The media can be different in the number of those signals they are able to express, Timeliness of feedback, and the ability of natural expression. Most of these factors are rich in one medium (Schiller & Mandviwalla (2007)).

Therefore face to face is the richest medium. It allows much communication such as body language, facial expression, voice tone, conveys a message as well as communication. The level of richness medium shown in table 3.

Table 3. Level of richness medium

Richness medium	Body language	Voice tone	Facial expression	Convey message
Face to face	✓	✓	✓	✓
Video call	✓	✓	✓	✓
Telephone		✓		✓
2-way Radio				✓
address documents(email, letters)				✓
Unaddressed document(bulk mail)				✓

The requirement are matched to the caliber of a medium, the performance of the task will improve.

Richard L. Daft and Robert H. Lengel (1984) found that in the organization the media is used for some better work than the other media. He specifically concluded that written media has been given priority for a clear message, whereas media is given preference for face-to-face messages for equality messages. In some study, medium richness theory not support in the impact of satisfaction and execution ((Dennis & Kinney, 1998) and (Suh, 1999)). Many new theories have been developed based on Robert H. Lengel and Richard L. Daft. One of them is MRT. It is used to understand the user's behavior because it is a psychological model. This theory introduces by Ned Kock in 2004. It can be considered as the Darwinian theory of behavior in relation to various types of communication media Kock et al. (2008). They argue that the evolutionary process of the last thousand years has given birth to the development of our brain, which has resulted in a

face to face communication. The new form of communication to impact our brain development. In the face to face communication the electronic communication tools to overcome the key elements and create cognitive difficulties in the communication. This is particularly important for complex tasks because they demand more intensive communication than simple tasks.

2.2 Social Impact on Communication

According to Connaughton& Shuffler (2007), the forms of communication are frequency and face-to-face. Constant communication enhances team identity and controls distance conflict relations(Hinds & Mortensen 2005). There is some more research are predictable research and the regular feedback improve the communication quality (e.g., (Jarvenpaa&Leidner 1999) and (Maznevski&Chudoba 2000)).

The face to face and frequency are the forms of communication but they don't cover the complexity of communication alone. the teamwork is dependent (Suchman (1987) &Weick (1993)) then how the team members are socialized in the organizational context. The suspicion is that the virtual team can reach the level of performance similar to the face-to-face teams due to the shortcomings of communication and visibility of team members.

Distributed teams are less efficient and so the transaction cost has increased and time has increased by completing its project(de Pillis and Furumo (2007)).

2.3 Communication Practices

In a distributed environment, the team success depends on communication, The issues of many distributed teams such as conflict management, trust or team gathering are contained in team communication practices and procedures. Therefore proper communication is an essential tool for distributed teamwork. Proper communication in a distributed team is dependent on the approach of building shared values and mutual understanding.According to Campton (2001), failure to establish and maintain this common ground may be a result of the breakdown of teamwork. The risk of breaking the communication, especially in new distributed teams increases (Hinds & Mortensen 2005).The communication practice comes in many forms of working culture, national culture,organizational culture(Dube and Pare 2001).

The above comments have been emphasized that the communication culture of a team created by the organizational structure of the company describes its collective communication behavior.And process which help organisation to create communication plan are used in our research approach.

3. Research Approach

In this research we are used to evaluate communication technology and culture in an IT firm.

The data collected from various people in Managerial and Lead position. The participants had a experience in working and leading distributed project team.The data collection and sampling is summarized in below Table 4.

Table 4.Data collection and sampling

Specialist:	Participant A	Participant B	Participant C
Designation	Project manager	Team lead	Project manager
Work experience	11 yrs' experience managing distributed team	7 yrs' experience leading distributed team	Managing distributed team last 9 yrs
Qualification	M.Tech	MCA	B.tech

The information is gathered via email and telephonic conversation.

4. Results

During our discussion, we came to know many issues and a problem that Project Managers and Lead found during the project in a distributed environment. Below i will explain the common challenges point by point for better understanding of the research outcome.

The challenges we found during discussion are as follows

1. Distance and lack of face-to-face communication

Project Managers informed that on a long distance team face to face communication is lacking because they are situated in different time zone, continents and cities and it is not possible to the company to send

Managers and all the leads to the other location because of expensive transportation cost. And such meetings are reserved to only Project Manager level. Which results in very rare opportunity to meet team members in person and it very difficult that written information is understood correctly.

So their team used an advanced tool like GoToMeeting or Google Meetup to arrange face to face communication. Also for message sending, they are used Vmoso tool which maintains the delivery status of the team communication flow by maintaining various threads of each and every communication.

Also, team follow up for sending information and report problems or its details frequently and precisely so that it is better understood by the team members in the virtual team to understand their task is very challenging stuff.

Another lead elaborates the problem in more details that virtual teams information loss when they are communicating with each other and because of network one party out in video conferencing or quick chat discussion. Although video conferencing is a good tool it is not having the same experience with the team in the same premises.

2. Difficulties with building trust and relationships

Trust build up is also one of the major challenges in a virtual team. During an interview, Managers focus that to make a relationship between the differences between the peoples who have never met is quite difficult. When they are a part of the team and they communicate only for a purpose means for task-related queries or info. So no casual talk which quite happens in the team members who are sitting next to each other [35].

4. Cultural differences and lack of common rules

Understanding and misunderstanding of team members due to cultural differences like same word different meaning are common management challenges [31]. Managers and lead also reported there is a lacking in common rules occur due to difference in culture create a negative impact in communication for e.g two teams are working on the same project one is from Bangalore and another is from Dubai [32]. In Bangalore team, Technical Lead level associate is also involved in the day to day programming with the team. But in Dubai Technical Lead level associate are not involved in programming and they are mainly involved in client interactions [33]. So Bangalore technical lead is not available in client call to answer his query. So it is very much needed that both sides team needs to aware of the set of rules following in other team locations [34].

5. Misinterpretation of written text

I also get to know that written communication also have many challenges in them which leads a lot of misinterpretations. One of the team lead informed me because of strict timelines team member do not revise the written emails and send it. This can cause a misinterpretation of information to the recipient.

6. Ignoring communication and lack of communication expectations

It is also reported by Project Managers that ignoring messages lacking the communication follow up and its importance. When virtual team members are not met with a person physically the chances to avoid communication becomes higher. So its important task to follow up all team communication and request.

5. Conclusion

We will conclude this paper, the distributed team build a communication pattern for the use of better communication. the offspring show the different forms of communication tools are available but the richest medium of the communication is face to face. with the use of proper communication techniques and plan, we will reduce the communication gap in a distributed team. In future, we will work on the methodology of the distributed team.

6. References

1. Bergiel, B.J. Bergiel, E.B. & Balsmeier, P.W. (2008) Nature of Virtual Teams: A Summary of Their Advantages and Disadvantages. *Management Research News*, Vol 31, No. 2, pp99-110.
2. Connaughton, S.L., & Shuffler, M. (2007) Multinational and Multicultural Distributed Teams: A Review and Future Agenda. *Small Group Research*, Vol 38, No. 3, pp 387-412.
3. Cramton, C.D. (2001) The Mutual Knowledge Problem and its Consequences for Dispersed Collaboration. *Organization Science*, Vol 12, No. 3, pp 346-371.
4. Cockburn, A. (2006) *Agile Software Development*, Second edition, Addison-Wesley Professional. Daft, R.L., & Lengel, R.H. (1984) Information Richness: A New Approach to Managerial Behavior and Organizational Design. In L.L. Cummings, & B.M. Staw (Eds.), *Research in Organizational Behavior* (pp 191-233). Homewood, IL: JAI Press.
5. Daft, R.L., & Lengel, R.H. (1986) Organizational Information Requirements, Media Richness and Structural Design. *Management Science*, Vol 32, No. 5, pp 554-571.

6. dePillis, E., &Furumo, K. (2007) Counting the Costs of Virtual Teams. *Communication of the ACM*, Vol 50, No.12, pp 93-95.
7. dePillis, E., &Furumo, K. (2006) Virtual vs. Face-to-Face Teams: Deadbeats, Deserters, and Other Considerations. *SIGMIS-CPR'06* (pp 318-320). Claremont, CA: ACM.DeSanctis, G., &Monge, P. (1999) Introduction to the Special Issue: Communication Processes for Virtual Organizations. *Organization Science*, Vol 10, No. 6, pp 693-703.
8. Galegher, J., & Kraut, R. E. (1994) Computer-mediated Communication of Intellectual Teamwork: An Experiment on Group Writing. *Information Systems Research*, Vol 5, No. 2, pp 110-138.
9. Goodhue, D. L. (1995). Task-Technology Fit and Individual Performance. *MIS Quarterly*, Vol 19, No. 2, pp 213-236.
11. Grosse, C.U. (2002) Managing Communication Within Virtual Intercultural Teams. *Business Communication Quarterly*, Vol. 65, pp 22-38.
12. Hinds, P.J., & Mortensen, M. (2005) Understanding Conflict in Geographically Distributed Teams: The Moderating Effects of Shared Identity, Shared context, and Spontaneous Communication. *Organization Science*, Vol 16, No. 3, pp 290-307.
13. Jarvenpaa, S., &Leidner, D. (1999) Communication and Trust in Global Virtual Teams. *Organization Science*, Vol 10, No. 6, pp 791-815.
14. Jarvenpaa, S., Knoll, K., &Leidner, D. (1998) Is Anybody out There? Antecedents of Trust in Global Virtual Teams. *Journal of Management Information Systems*, Vol 14, No. 4, pp 29-64.
15. Kayworth, T., &Leidner, D. (2000) The Global Virtual Manager: A Prescription for Success. *European Management Journal*, Vol 18, No. 2, pp 183-194.
16. Kock, N. (2004). The Psychobiological Model: Towards a New Theory of Computer-Mediated Communication Based on Darwinian Evolution. *Organization Science*, Vol. 15, No. 3, pp 327-348.
18. Maznevski, M.L., &Chudoba, K.M. (2000) Bridging Space Over Time: Global Virtual Team Dynamics and Effectiveness. *Organization Science*, Vol 11, No. 5, pp 473-492.
19. Oertig, M., &Buegri, T. (2006) The Challenges of Managing Cross-Cultural Virtual Project Teams. *Team Performance Management*, Vol 12, No. 1-2, pp 23-30.
20. Schiller, S.Z., &Mandviwalla, M. (2007) Virtual Team Research: An Analysis of Theory Use and a Framework for Theory Appropriation. *Small Group Research*, Vol 38, No. 12, pp 12-59.
21. Suchman, L. (1987). *Plans and Situated Actions. The Problem of Human Machine Communication*. Cambridge, UK: Cambridge University Press. Townsend, A.M., DeMarie, S.M., & Hendrickson, A.R. (1998) Virtual Teams: Technology and the Workplace of the Future. *The Academy of Management Executive*, Vol 12, No. 3, pp 17-29.
22. Weick, K. (1993). The Collapse of Sensemaking in Organizations: The Mann Gulch Disaster. *Administrative Science Quarterly*, Vol 38, pp 628-652.
23. RAJ Shree, RA Khan. Wormhole attack in wireless sensor network. 2014/1, *Journal Int. J. Comput. Netw. Commun. Secur*, Volume 2, Issue 1, Pages 22-26.
24. Prabhishkek Singh, Raj Shree, "Statistical Quality Analysis of Wavelet Based SAR Images in Despeckling Process", *Asian Journal of Electrical Sciences (AJES)*, Volume 6 No.2 July-December 2017 pp 1-18.
25. Prabhishkek Singh, Raj Shree, A new homomorphic and method noise thresholding based despeckling of SAR image using anisotropic diffusion. *Journal of King Saud University - Computer and Information Sciences* (2017), <http://dx.doi.org/10.1016/j.jksuci.2017.06.006>
26. Prabhishkek Singh, Raj Shree, Manoj Diwakar, A new SAR image despeckling using correlation based fusion and method noise thresholding. *Journal of King Saud University - Computer and Information Sciences* (2018), <https://doi.org/10.1016/j.jksuci.2018.03.009>
27. Prabhishkek Singh, Raj Shree, "Importance Of DWT In Despeckling SAR Images And Experimentally Analyzing The Wavelet Based Thresholding Techniques", in *International Journal Of Engineering Sciences & Research Technology*, 5(10): October, 2016.
28. Prabhishkek Singh, Raj Shree, Quantitative Dual Nature Analysis of Mean Square Error in SAR Image Despeckling, in *International Journal on Computer Science and Engineering (IJCSE)*, Volume 9 Number 11 Nov, Page: 619-622. (2017)
29. Prabhishkek Singh, Raj Shree, "A Comparative Study to Noise Models and Image Restoration Techniques", in *International Journal of Computer Applications*, Volume 149 - Number 1, Year: 2016.
30. Prabhishkek Singh, Raj Shree, Statistical Modelling of Log Transformed Speckled Image, 380 Vol. 14 No. 8 AUGUST 2016 *International Journal of Computer Science and Information Security*, (pp. 426-431).
31. Prabhishkek Singh, Raj Shree, A New Computationally Improved Homomorphic Despeckling Technique of SAR Images, *International Journal of Advanced Research in Computer Science*, Volume 8, No. 3, March April 2017.
32. Prabhishkek Singh, Raj Shree, Analysis and effects of speckle noise in SAR images, *IEEE International Conference on Advances in Computing, Communication, Automation (ICACCA) 2016*.
33. Shashi Kant, Prabhishkek Singh, MadanKushwaha, "A New Image Enhancement Technique using Local-Correlation based Fusion using Wavelet Transform", 2018/5/3 *International Journal of Current Trends in Science and Technology* Volume 8 Issue 05 Pages20601-20610
34. Shashi Kant, Prabhishkek Singh, MadanKushwaha, "Wavelet based Image Enhancement using Fusion", 2018/4/11, *GADL Journal of Inventions in Computer Science and Communication Technology* Volume4Issue2Pages43-53.