International Journal of Emerging Technology and Advanced Engineering
Website: www.ijetae.com (ISSN 2250-2459, ISO 9001:2008 Certified Journal, Volume 6, Issue 9, September 2016)

Evaluation of Communication Pattern and Issues in Construction Industry

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***Abstract* — Construction industry is ever evolving. Each project is unique in its nature. But undoubtedly every project creates vast amount of information which may be technical or non-technical. As large number of stakeholders including Engineers, Clients, and Contractors etc. are involved in the projects; it is of prime most significance that this information is communicated in the best possible manner. Communication essentially improves the co-ordination amongst the members, which in turn improves the overall efficiency of project. Even though Information and Communication Technology and various protocols of communication have been implemented with bulk monetary investment, many of the construction works still report numerous communication issues. Improper or untimely communication can lead to accidents, time delays and cost over runs. This paper critically reviews the significant channels of communication among the stakeholders, identification and quantification of communication issues and pattern of communication among different stakeholders, aiming to suggest improvement in interaction among stakeholders.**

***Keywords*— communication channels; communication pattern; construction industry; information and communication technology; online survey.**

I. Introduction

Each construction project is unique and ever evolving, which makes it difficult to attribute any particular feature to projects as such. But everyone do concur to the fact that substantial amount of data is involved in the construction projects, which needs to be dispersed amongst a wide spread of stakeholders including clients, contractors, engineers, architects, labours, bureaucrats and so on. All of them play a critical part in a complex communication network. It is of utmost significance that these stakeholders communicate in effective manner so as to avoid potential issues like time and cost over runs.

On an average, design revision tends to increase the schedule by 1.9 days per month. Increased number of RFI (Request for Information) may evince blurry technical specifications, guidelines or drawings. A private survey by Navigant Construction Forum in 2013 revealed Average RFIs/Project in Asia is 1053 compared to 887 & 791 in America and Europe respectively. This reinforces the fact there is lack of proper dissemination of information across various departments and parties in the projects.

So as to improve the communication, the basic studies need to be conducted are identification of communication channels used by the actors, communication patterns for each category including proportion of communication with other categories, significant communication issues prevailing in the industry and quantitative measure of these issues.

II. Objective And Scope

The study is intended to identify the communication issues in construction industry in particular. The outcomes may effectively cut down the current communication problems at various levels of the project. Improved communication amongst the stake holders may improve the overall efficiency of the projects, because of improved co-ordination among the members.

III. Communication Issues

A survey on communication issues in construction industry by Xie, Thorpe, and Baldwin [1] revealed most respondents experience communication problems, which appear frequently in both internal and external communication processes. These problems could seriously impact on the construction design, and occur more often at certain stages of the design and construction processes. Inaccurate information, late information and information under load are prevalent in construction design. The probable causes have been identified for some of major communication problems. The research suggests that a lot of inaccurate information in construction design arise from poor co-ordination, conflicting and poor communication skills.

A study primarily focused on the Indian construction industry by Kirti [2] revealed characteristically distinct features dominant in the country. Construction projects in India at present are far more complicated than ever before. The research revealed a culture which shows a reality of conflicts and lack of mutual respect and trust among the stakeholders. It was concluded in a study that the top 30 potential problems contributing to poor project performance could be classified into five categories, out of which communication problems are listed as the third most significant category and all five categories involve communications to some extent.

Directly or indirectly public is always involved with construction projects. Many of the infrastructure programs suggested by the government gets black balled due to lack of co-operation from the public. Many a times, the reason for these concerns are improper communication. Lapsansky, Morris, Roseberry and Serrat [3] conducted a study on behalf of ADB, analysed recent civil society concerns to identify trends. It covered more than 200 projects with a total value around $10 billion, two-thirds of which belong in the transport and energy infrastructure sectors. The study revealed that 55% of issues, arise due to inadequate interaction and participation, highlighting the importance of improving these areas.

IV. Language Barriers

The economics' rapidity especially in the southern states has attracted workers from North India to work in the regions that needed work force. Lately Hindi is becoming the official language for construction across the whole country. The sites are packed with immigrant labours, and Hindi has become the communication language for connecting to the labours. As on July 12, 2014, the number of labours enrolled under Welfare Boards setup by the Tamil Nadu Manual Worker Act, 1982 is 23 lakhs. The larger part of which comes from Bihar, West Bengal, Orissa and Andhra Pradesh.

To study the impact of language barriers in the industry Salleh, Nordin, and Rashid [4] observed the patterns in Malaysian Construction Industry. Surveys have showed that about 13.9% of the respondent said that language is the barrier to effective implementation of work safety and health in the construction industry. Language barrier has posed problems at site all over the world. Research also proved that around 50% of the foreign labours are unable to conceive the instruction that was presented because of the lack of understanding for the English whereby 2 out of 3 foreign workers make mistakes in their work as they do not understand the orders. Accidents or death of workers at site will for sure a loss to all parties involved in the construction project.

V. Communication Channel And Patterns

Shohet and Frydman [5] in their studies observe that construction processes are becoming highly complex in nature and involves multiple disciplines and electromechanical systems, demanding better communication. Studies indicate bidirectional communication improves quality in construction. A construction manager typically communicates with the users, owner, designers, project engineers, contractors, suppliers and superintends, in writing, face-to-face or via electronic means. Almost half the communication is informal.

The modes of communication were generally classified into Written Technical Communication (e.g. design drawings, letters, specifications, e-mails), Verbal Communication (face to face meeting, group discussions), Verbal Communication by electronic means (tele-conferencing, telephone). Statistical analyses revealed that informal communications continue to be highly important in ensuring the efficiency of the construction manager. Forty-eight percent of the communications at the construction manager level were carried out via verbal means. The comparative analysis showed that the construction manager's capability to communicate effectively with the design team is crucial in overcoming information gaps between the design and construction phases. Thorpe and Mead [6] also identified the communication patterns among the different categories by deploying a Communication Frequency Matrix, which depicts the frequency of interaction

Alsamadani, Hallowell, Will and Cabello [7] in their research tried to quantify the usage of various channels of communication prevalent in the industry, which included Formal communications, Written communication, Training, Informal discussions and Toolbox talk. Laufer, Shapira and Telem [8] further extended this list by including e-mail communication and unplanned meetings.

VI. Factors Affecting Communication

Tipili, Ojeba and Ilyasu [9] in their research made use of a 3-point ranking system in which low, moderate, and high were utilized by the respondents who were asked to indicate from a list of how communication is achieved currently on site, how much effect each has and how frequent those occurs. The study revealed out some of the major factors affecting communication in construction, which included

1. Inexperience
2. Delay
3. Site meetings
4. Late dissemination
5. Unclear channel
6. Language problem
7. Training operatives

Henesy [10] in his research observed multiple cases there is communication gap among the departments, arising due to lack of co-operation. The study also suggested need for developing guidelines and procedure for communicating the owner's objective to the whole crew involved. The many issues appear in the studies of Cheung, Yiu and Lam [11], where the author suggests information exchange is improper among various actors like client, advisers, construction team etc is hampered due to unclear channels, unclear objective, inadequate and insufficient information.

VII. CONCLUSIONS

From the rigorous literature reviews and preliminary consultation with experts in the industry, it may be drawn that communication plays a significant role as far as the construction projects are concerned. Research conducted on the theme suggests detailed study is required to identify the communication features in the field. The approach to be followed as per groundwork done is

1. Identify the Communication Channels and the preference and usage frequency by each category
2. Pattern of Communication (frequency with which different categories interact)
3. Factors causing communication issues and each one's magnitude

Major communication channels identified

1. Site Review Meeting
2. Project Reports
3. Formal Communications (E-Mails, Letters etc)
4. Organizational Breakdown Structure
5. Work Breakdown Structure
6. Resource Breakdown Structure
7. Record Management System
8. ERP tools
9. Team Meeting Discussions
10. Employee Suggestion Scheme
11. Informal Communication (may include social media apps)

Major stakeholders in Communication Matrix

1. Clients
2. Contractors
3. Consultants
4. Managers
5. Design Division
6. Architectural Division
7. Planning Division
8. Execution Division
9. Stores Division
10. Finance Division
11. Supervisors
12. Labors

Significant factors affecting communication

1. Late receipt of documents
2. Unclear communication channel
3. Inexperience in interpretation of documents
4. Faulty or irregular formats
5. Incorrect/ Not up to date documents
6. Language issues
7. Lack of dedicated communication channel
8. Unclear project objective
9. Power disparity, difficult in communicating to seniors

Investigating the mentioned elements, suggestions required to mitigate the communication issues may be formulated, as the user cognize the specific channel preferred, interaction pattern and prevalent issues faced for each community distinctly. Predicting the preference level for channels may also help to evaluate and justify investment in ICT. Communication is more strategic, now more than ever and has proved to be a global phenomenon, across all the human beings. From technical point of view, improved communication is to curtail the cost and time over run, but from holistic view, it is to foster better bond amongst humans.

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