

COMMUNICATION MANAGEMENT IN CONSTRUCTION A STATE OF LITERATURE REVIEW

Ms. Priyadharshini N S¹, Ms. Sashara P²

*^{1,2}Assistant Professor, Department of Civil Engineering, P.A. College of Engineering and Technology,
(India)*

ABSTRACT

In construction industry, project communication is the soul of project management. The role and importance of communication can be determined by taking a closer look at initiation, execution and close down, the three main phases of construction projects. Statistics shows that 74% of construction projects are unsuccessful. One among the many factors that contribute to the failure of these projects is insufficient & improper communication among the project participants. This paper provides the results of a literature study of the extent to which poor communication management influences impact on organization performance and project success. It focuses on the particular factors within the categories of culture, human resource management, leadership, technology and communication skills. In addition, it highlights the practical experience of the experts that form the source of personal beliefs; the perceived relative importance for each of the factors in contributing to performance and the aspects of communication skills and strategies that are employed within construction projects. It also investigates the communication strategies employed by project managers and their effectiveness in communicating within an organizational circumstance.

Keywords: communication strategies, effectiveness, performance, success, project management

I. INTRODUCTION

1.1 General

Construction industries play an important role in economic growth of developing countries and it is long-familiar combating with numerous uncertainties. The expansion of construction sector widely spreads out with an increased complexity of management of construction projects. Communication is the soul of project management. In the world of project management today, it has become more important to turn the efforts toward more effective means of communication. As breathing is necessary for all the time to sustain life likewise, communication is the livelihood of projects and organizations performance.

1.2 Project Communication

Project communication is the exchange of project-specific information with the emphasis on creating understanding between the sender and the receiver. Project communication is the responsibility of everyone on the project team.

1.3 Effective Communication

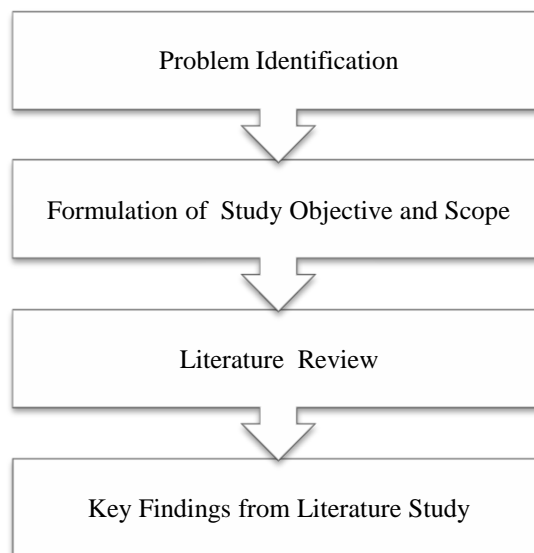
Effective communication means that the information is provided at the right time, in the precise format, and with the right impact. Effective communication is one of the most important factors contributing to the success of a project.

1.4 Efficient Communication

Efficient communication means to provide the project participants only the information that is needed.

II. METHODOLOGY

This study involves data collection on barriers of communication and problems resulting from inefficient communication in construction projects through "Literature Study" and "Interview Survey". Analysis of data helped in developing the questionnaires based on relationships amongst the identified key problem statement with the focus on the project stakeholders. The questionnaire has been designed for quantitative analysis by statistical analysis tools and contains structured questions. To this end, a pilot study has been conducted to test the effectiveness of the questionnaires and it was finalized.



III. PROBLEM STATEMENT

Ineffective communication management system in construction project delivery is the major cause of failures associated with construction projects. As such, the problems of communication in construction project delivery are enormous. As the project unfolds and the design is comprehended, information in the form of drawings, specifications and construction techniques must be communicated from one expert to another and communication feebly managed will lead to de-motivated labor force, design errors, decelerated in the entire job and failure in production. Therefore, using an appropriate communication management system to resolve construction and design problems is essential.

One of the most serious barriers that any company faces is to resolve the problem of information is use of appropriate communication and communication means. To resolve construction and design problems proper communication medium is essential. In order to fully understand the problem of communication in the construction industry, the following questions have been generated for the study:

- (1) How much significance do constructional project professionals place on communication?
- (2) How have project professionals managed communication on construction projects in present scenario?
- (3) What is the origin of communication barriers on construction projects?
- (4) What are the various communication channels used by project professionals on a project?
- (5) Does construction project communication affect project delivery?

IV. STUDY OBJECTIVE AND SCOPE

The objective of this study is to review the past studies related to inefficiencies in construction communication, their rankings and related communication management models application to develop a communication management for Indian construction industry. The study aim is to critically assess project communication among the project stakeholders however; the specific objectives of the study are as follows:

- (1) To determine the applicability of the past studies in Indian scenario
- (2) To find out the problem of poor communication in construction projects
- (3) To find out the important factors responsible for ineffective communication (contractual barriers, cultural barriers, technology barriers, or human personality barriers)
- (4) To study the existing effective communication methods and its inefficiency and
- (5) To find out the need of advancement of communication tool/protocol in future.

The study scope is to critically improve project communication among the project stakeholders however, the specific scope of the study are as follows:

- (1) To improve the performance and profit of an organization.
- (2) To ensure timely completion and success of the project.
- (3) To standardize the communication system in construction to avoid improper and miscommunication.
- (4) To minimize information related time delay and cost overrun in a project.

V. LITERATURE REVIEW

A systematic literature review on project communication management and problems of delivering effective communication of construction project was carried out. The articles on risks curtailed with ineffective communication in construction project were searched from various sources (Journals, Proceedings, Web). A much larger number of papers were examined. The papers related to communication in construction project, articles identifying factors for ineffective communication and assessing better communication protocol for construction project were selected. The editorial published on tools and techniques used for communication management in current trend and future research needed were also selected. The literature review is classified into three; first section focuses on communication problems (both barriers of communication and effects of inefficient communication) in the construction industry, section two focuses on the concepts of communication management in construction and section three focuses on the researches in improving communication in construction.

5.1 Section I - Communication Problems

Mei Yuen Foong (2014), addressed that in the recent PMI's 2013 Pulse of the Profession report, it has revealed that the most decisive success factor in project management is effective communication to all stakeholders. The research also finds effective communication leads to more successful projects and hence allowing organizations to become high performers. In the same report, it revealed that not all projects will succeed. Typically, two in five projects do not meet the project's original goal or intent and one- half of those unsuccessful projects are related to ineffective communication. Communication is one key element which has to be applied effectively throughout a project's life cycle from the beginning till the end. The article provides certain guidance to project manager to develop a formal communication plan during project planning. In conclusion, effective communication is indeed important for a successful project and in order to achieve effective communication in a project, planning communication is indispensable and using tools and putting processes in place to ensure daily effective communication during project execution will overcome the challenges and contribute to a more successful project.

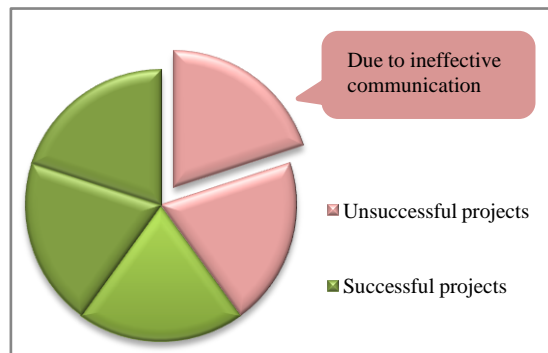


Fig. 1 - One out of five Projects is Unsuccessful Due to Ineffective Communication

Savita Sharma & Pradeep K. Goyal (2014), presents a state of the art review of major and frequently occurred cost overrun factors and project cost risk assessment models in construction projects. Recently it has witnessed that a large number of projects are facing the problem of cost overrun due to some factors. Those factors are associated with some sort of risk and uncertainty of the project. Jackson (2002) carried out a study on building erection projects in UK. It was seen that the most imperative factors causing cost overrun were identified as poor project planning and management, unforeseen ground condition, design development, lack of information.

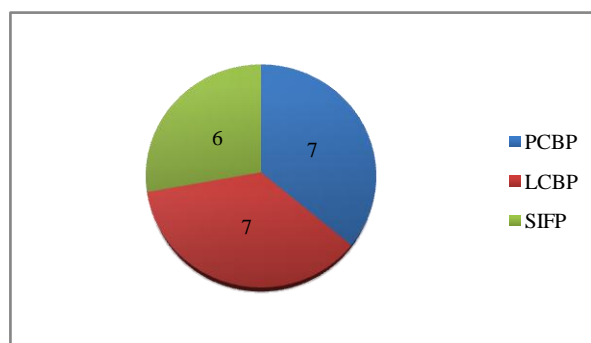


Fig. 2 - Frequency of occurrence of Communication Related Factor in Cost Overrun

Luka Goji Tipili, Patricia Oyiza Ojeba, et al., (2014), evidenced that ineffective communication management system in Nigeria is the major cause of failures associated with construction projects delivery. Many of the professional respondents agreed that site meetings are an important channel of communication between the consultants and contractors thus, has a significant effect on project delivery. Further, all the players within the industry agreed that lack of proper communication management has a great effects on delivery of construction project. The communication plan reviewed regularly and adjusted becomes necessary for project successes. In the Nigerian construction industry, there is a strong positive reception for the importance of project communication management and its effects within the industry. In fact, various levels and channels of communications have been established within the construction industry. This research has shown that, the project communication strongly affect the performance of professionals in the construction industry. Therefore, clearly establishing and managing the structures of communication on project must always be on the agenda of team leaders and management before the commencement of every project.

J. Von Meding and J. Bruen (2010), states that the fifth barrier to attaining quality in construction in Brunei (80%) was found to be a lack of management's communication commitment. A very important tool is communication that assists in the flow of any projects information being conveyed from one party to another and hopes to avoid misunderstanding and misleading. The consequences of miscommunication include conflicts arising (Low and Goh, 1992) that could thwart the project to be completed and delivered on time, or at a worse case become a failure.

Ambsisi Ambituuni (2009)

➤ Design errors

Achievement of error free design should entail excellent communication with the entire design team and integrating a design process that is properly planned, giving enough time for corrections, extensive investigation and reviews.

➤ Scope change

It is important to seek approval for changes from sponsor and communicate changes in a timely way to keep away from disputes.

➤ Complexity of a project

Project complexity could also be defined in term of the diversity of stakeholders with different interest and long chain of communication channel with slow feedbacks (Cerpa and Verner 2009).

➤ Slow closeout

Stakeholder satisfaction is achieved by providing all necessary information required by them and also to avoid conflicts and doubt. The information can include a timeline showing the progress of the project from the beginning until the end, the objectives that were met or missed, the tribulations encountered and a concise financial presentation.

It was concluded in the study that the top five potential problems contributing to project delay and cost overrun involve communication to some extent.

K.N JHA and K.C. IYER (2006), briefly sets out the reasons for the underperformance of the quality of Indian construction projects and possible remedial measures was suggested. Project manager's competence; top management support and their competence; interaction between project participants; owners' competence; and monitoring and feedback by project participants are the factors having positive contributions to achieving the desired quality. The other two factors that have a significant contribution in improving the project quality are found to be 'top management support' and 'interaction between project participants'. The essential factors to achieve good quality are the 'human element rather than machinery' and 'good communication among people'.

BRE guidance on construction site communication (Anon.2011), states that every year defects in the UK construction industry cost at least £20 billion to repair or re-establish. Some of the flaws will be the result of poor communication. For instance, a defectively detailed drawing, operatives being given erroneous instructions or technical information not being available. This guidance provides advice on how communication can be improved to and around a construction site. Perfection in communication should result in an increase in the quality of the build and a reduction in the level of defect occurrence. The communication issues in different phases of typical construction project are illustrated and issues to be agreed include method issues and people issues.

M.E.L. Hoezen, I.M.M.J. Reymen, et al., states that the communication is an important topic in the construction industry. Often troubles in construction are referred to as communication problems [Emmerson 1962]; [Higgin and Jessop 1965]; [Latham 1994]; [DETR 1998]. This is due to its specific characteristics; the industry forms a multifaceted communication environment. Construction is a fragmented and lively sector with a project based nature. It turned out that most problems were reported in the communication between demand side and supply side stakeholders. The strong interaction in construction projects between stakeholders on the demand side and on the supply side seems to make construction projects very vulnerable to communication problems.

5.2 Section II - Communication Management in Construction

Benita Zulch (2014), identified that an important characteristics that a construction Project Manager should possess to ensure successful communication. In this paper the difference between the leadership as a communication and communication as a leadership skill is defined. To manage a project effectively three types of communication (vertical, horizontal & diagonal or lateral communication) is needed. Barrett (2006b) emphasizes that as manager progresses to higher levels in the organization, the more complex communication demands become. The leadership communication can be of core, managerial & corporate communication. Finally from the research study the characteristic that a construction project manager should possess to ensure successful communication ranked the highest is developing trust, collaboration and teamwork; ranked second is allowing team members to take responsibility of their work; third is sharing the vision of the project with the project team; fourth task orientation and fifth people orientation.

Harry Tomi Davies (2013), mainly focuses on what communication is all about in managing a construction project. It covenants with

- When communication fails
- How to plan communication

- How to communicate within the project team
- Communicating with the managers and other project participants
- Communicating with the supplementary stakeholders
- Using right medium and how communication is said to be secret weapon

Vasanthi R. Perumal and Abu Hassan Abu Bakar (2011), implies that communication is not only sharing of information but of providing what actually required. In this literature, the importance of communication instruments (estimation , cost plan, payment advice, cost report, escalation costing presentation, final account, standard system documents, drawings, contract condition and preliminary documents) used by the professionals (Architect, Project Manager, Engineer & Quantity Surveyor) is identified through questionnaire survey. The survey result in this literature indicates that the three communication skills, namely verbal, written and contractual, have almost the same importance in construction industry. It also emphasis on the importance & benefits of standardization of communication instruments, plans, structures and flows in construction project.

Ksenija Culo (2010), implies that the communication process is essential in Project Management. A communication plan allows the project manager to approach effective and efficient communication. The analysis of communication requirements determines the information (organization chart, project organization responsibility & relationships, disciplines, departments, logistics of how many persons will be involved with project, internal & external information needs) needs of the project stakeholders. The factors affecting the management of project communications are mentioned as urgency of need for information, accessibility of technology, anticipated project staffing, duration of the project, project milieu. The identification of the number of potential communication channels is critical as it is an indicator of the complexity of a project's communication. The total number of potential communication channels is determined using the formula $n(n-1)/2$. The obstacles to project communications are identified as political, cultural, linguistic factors. This literature also emphasis on importance to understand what information is needed and the level at which they need to receive it.

Mustafa Alshawi (2013), briefly sets out the problems and challenges facing the current project management practices. The limitations of the current project management practices are

➤ Lack of adequate communication

The limitation of the current project management practices highlights lack of communication in construction industry which often resulted in

- Additional disbursement due to reworking
- Lack of incorporation with the supply chain

5.3 Section III - Researches in Improving Construction Communication

Ballan and El-Diraby (2011), summarizes the results of a survey that aimed at testing the usability of major communication tools and future mobile communication systems in the construction industry. In addition to documenting regarding the utility of communication tools, the main issues that could hinder the use of communication systems in the industry was tried to address in the survey. Three elementary issues limit the

usability of more advanced ICT tools. First software, second weak process structure and finally culture. Three values- generating components are key to overcoming such barriers. First content, second access and finally usability. The initial model of three dimensional matrix that includes identification of contexts of communication, the information needed/exchanged and the tools of communication.

➤ Context for communication

The construction sector includes Residential (single and multi-unit), Industrial Commercial Institutional (ICI), and Heavy Civil (Infrastructure & Roads). It was determined that since the Residential and ICI sectors involve the same type of construction activities, they can be combined and considered as one context. On the other hand, the Heavy Civil sector involves the construction of infrastructure and roads. The information requirements on projects of this nature are specific and unique to the type of construction. The communication stakeholders include Contractor (General contractor, Design builder, Construction manager); Developer; Sub-contractor; Owner/Client (Public, Private); Labour (Unionized, Non-unionized). When analyzing the various contractor types, it was determined that all have similar characteristics and information requirements. Working for a public owner does not change the information requirements or needs of contractors. The type of labor involved on a project does not change the information requirements and needs of the contractor.

➤ Information needs/requirements

In the pre-project phase, information exchanged is generally communicated between the owner, contractor's project manager and the design team. This is different from the erection and turnover phase, where the bulk of the information is predominantly communicated to the project manager, site superintendent/foreman and design consultants. The categories used for information needs and requirements of the construction industry are Request for information; Material management; Equipment management; Cost management; Site, schedule and construction information; QC/QA management and Safety.

➤ Communication tools

Five modes of communication listed are face to face, phone (land line or mobile), fax machine, hard copy (courier/delivery/pick-up) and e-mail.

E.G.Ochieng and A.D.F.Price (2009), addresses the increasing global nature of construction projects and there has been no empirical work that quantifies explicitly the extent to which communication determines the success of multicultural projects. The study examines the literary factors that influence communication and explores how communication can be made effective in multicultural project environments. The data from 20 interviews, the result shows that communications within multicultural project environments can be effective when project managers demonstrate an awareness of cultural variation. This study reveals that participants acknowledged that effective communication on project is aided by the early establishment of clear lines of responsibility and clear robust issue resolution process within the integrated team.

Orjan Wikforss and Alexander Lofgren (2007), addressed that in recent years it has been identified that some of the fundamental components contributing to the construction industry's poor performance are its ineffective



communication practices, its organizational disintegration and lack of integration between design and production processes (Dainty et al., 2006). This paper introduces the subject field of Project Communication Management, which considers the enhancement of organization, group processes, work procedures, in addition to the sharing and transfer of knowledge between different professional domains in projects and corporations. The subject area has a special focal point on the concept of the integration of project organizations and the creation of an effective platform for collaboration through shared ICT business tools. One right way of research in this area is the problematic issue of creating true efficacy, user acceptance and organizational approval of ICT in project team work. This paper describes some of the fundamental collaborative communication issues in planning, design and production phases of construction projects based on four indicative feasibility studies in the Swedish construction sector. The paper introduces the perception of project communication research and outlines an initial conceptual framework for developing communication practices combined with supportive ICT as a facilitator for improved organization and management of future construction projects.

Jay Yang and Vanita Ahuja state that building projects require the interaction and coordination of various stakeholders during all stages of the project life. In current scenarios, the project team members are often geographically separated and their successful management can be enhanced by effective communication management. In the construction industry, 97% of the companies employ less than 20 persons, and can be classified as Small and Medium enterprises (SMEs) (Katranuschkov et al. 2001). Therefore any communication management research for the building construction industry needs to address management characteristics and communication processes suited for SMEs, in order for the strategies developed to become industry standards. Numerous studies have highlighted the importance of effective communications for project success (Biggs 1997 and Tam 1999). It was accomplished in a study that the top 30 potential problems contributing to poor project performance could be classified under five categories, out of which communication problems are listed as the third category and all five categories involve communications to some extent (Thomas et al. 1998). For paradigm, time delays and amplified cost in construction projects can be traced back to poor coordination caused by inadequate, insufficient, inappropriate, inaccurate, inconsistent, belated information or a combination of them all (Tam 1999).

John A. Kuprenas states that information and communication are an integral part of any construction effort. Often times relevant information may not be available when needed leading to a constant re-inventing of the wheel (Veshosky 1998). Even if information is available and distributed, the meaning of the message may not be correctly interpreted or understood (Pietroforte 1997). The future for the construction engineering and management industry holds the promise of integrated development of design by all project parties, instant access to all information by all participants in all phases; virtual smart models guide design and construction process, no division between the participants, and an emphasis on the program pretty than the project. Unless research needs with respect to communication are identified and addressed, the information technology tools and the product and process development tools being developed today will be of appreciably less value. Communication is essential to construction industry it must not be neglected in our future.

SECTION	KEY FINDINGS
I	<ul style="list-style-type: none"> - Time delay - Cost overrun - Poor quality - Poor supply chain management - Issues in project delivery - Risk initiation - Project failure - Poor organization performance
II	<ul style="list-style-type: none"> - The total number of prospective communication channels is determined by the formula $n(n-1)/2$. - Communication plan development and its importance - Communication tools, items and methods commonly used. - Barriers of effective communication in construction - Potential problems of communication in different phases of project (initiation, execution and closure phase)
III	<ul style="list-style-type: none"> - Focused problem definition, - Main study objective and scope, - Possible study methodology to tackle the problem and - Questionnaire for improving communication in construction

VII. CONCLUSION

Since there has been no empirical work that quantifies the extent to which communication determines the success of construction projects and an attempt to study is made through literature review. In-order to understand communication in construction in a better way, concepts of communication instruments, items, tools, requirements, types, methods and plan is studied in detail through literature study and interaction with project stakeholders. This literature study examines the underlying factors that influence communication and to prove the past studies practically, a questionnaire is developed. Through questionnaire survey among the project stakeholders it can be examined how communication can be made effective in construction project environments by overcoming the existing barriers.

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REFERENCES

- [1] Ballan and El-Diraby (November 2011), "A value map for communication systems in construction" *Journal of Information Technology in Construction*, November 2011, Vol. 16, pg. 745-760.
- [2] Benita Zulch (2014), "Leadership communication in project management", *Journal of Social and Behavioral Sciences*, 27th IPMA World Congress Procedia - Social and Behavioral Sciences 119(2014), pp. 172 – 181.
- [3] E.G.Ochieng and A.D.F.Price (August 2009), "Managing cross-cultural communication in multicultural construction project teams: The case of Kenya and UK" *International Journal of Project Management*.
- [4] E.O. Aiyewalehinmi, " Factor Analysis of Communication in the Construction Industry," *The International Journal of Engineering And Science (IJES)*, vol 2, Issue 10, pp. 49-57, 2013.
- [5] Jay Yang and Vanita Ahuja, "Communication protocol for building project management - ICT enhanced approaches for the Indian building practice". 9) John A. Kuprenas, "Communication growth and research needs in the future of construction engineering and management".
- [6] Karel de Bakker, Albert Boonstra and Hans Wortmann (2014), "The communicative effect of risk identification on project success", *International Journal of Project Organisation and Management*.
- [7] Ksenija Culo (2010), "Communication management is critical for project success" *International Journal for Project Management*.
- [8] Luka Goji Tipili, Patricia Oyiza Ojeba and Muhammad Saadiya Ilyasu (June 2014) "Evaluating the effects of communication in construction project delivery in Nigeria" *Global Journal of Environmental Science and Technology*.
- [9] Nuruddeen Usman and Ilias Said, "Impact of Technological Devices on Information and Communication Technology Acceptance for Construction Site Management in Nigeria," *Journal of Emerging Trends in Computing and Information Sciences*, vol. 3, March 2012.
- [10] Örjan Wikforss and Alexander Löfgren "Rethinking Communication In Construction" Research Paper published on May 2007.
- [11] Savita Sharma & Pradeep K. Goyal , "Cost overrun factors and project cost risk assessment in construction industry - A State of the Art Review," *International Journal of Civil Engineering (IJCE)*, vol. 3, Issue 3, May 2014, pp. 139-154
- [12] Vasanthi R. Perumal and Abu Hassan Abu Bakar (2011), "The needs for standardization of document towards an efficient communication in the construction industry", *World Applied Sciences Journal*.
- [13] Yuan Chen and John Kamara (June 2008), "The mechanisms of information communication on construction sites" *FORUM Ejournal*.
- [14] Ambisi Ambituuni (2009), "Five causes of project delay and cost overrun and their mitigation measures", An article presented to The Robert Gordon University.
- [15] Harry Tomi Davies (2013), "The Secret Weapon", an article by the African project manager.
- [16] Mei Yuen Foong (April 2014), "Effective communication : A challenge to Project Managers" in *Project Times Article*.

- [17] K.N JHA and K.C. IYER (2006), “Critical factors affecting quality performance in construction projects” Total Quality Management.
- [18] J. Von Meding and J. Bruen (2010), “Critical success factors of construction project quality in Brunei Darussalam” ,The International Conference on Sustainable Built Environment for now and the Future.
- [19] M.E.L. Hoezen, I.M.M.J. Reymen, G.P.M.R. Dewulf "The problem of communication in construction".
- [20] Mustafa Alshawi (2013), “Web-enabled project management: an emerging paradigm in construction” Automation in Construction.