# PROJECT COMMUNICATIONS MANAGEMENT - A WEB BASED CONSTRUCTION MANAGEMENT APPROACH

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## ABSTRACT

The term Project Communication Management Process is a set of steps that needs to be adopted for proper communication in every project of an organization.The effectiveness and efficiency of construction process strongly depends on the project communications. Due to lack of proper communication among various stakeholders the construction industry is fragmented. It is need of the hour to get new tool for communication in order to change the fragmented nature of construction industry. Further improvement in the communication within stakeholders could reduce the project failure. People in various industries around the world are finding that Information Technology (IT) provide highly effective tool for communication, co-ordination, and collaboration across and among enterprise and people. Deployment of IT tools is playing vital role in various industries to improve communication. Some attempts have been made to use these IT tools for various applications in construction industry also. But the construction industry is lagging far behind in adapting IT tools as compared to other industries. This is true especially for small and medium scale industries. The increasing usage of web based system can brought about changes in the construction industry regarding project communications in order to improve quality, competitiveness, profitability and better relation with project stakeholders. This proposed paper discusses the use of dedicated web based tools that can be used in construction industry for project communications management process.

*Keywords --Communication, IT in Construction, Web Based, ERP, Project Management*

## I.        INTRODUCTION

Today communication has developed to such an extent that project managers, contractors, design team all can keep in touch during project life cycle. People at site can receive instruction, layout, working drawings, structural details etc. and go about their work. People at the office can keep track of development at the site too. Project communication is the exchange of project specific information with the emphasis on creating understanding between project stakeholders. Communication is essential for the purpose of information distribution and human understanding of the project. Project communication in general is the responsibility of

everyone on the project team. However in particular, projectmanager is responsible for the development of project communication management plan.

Construction industry sources suggest that 85% of the project manager's time is spent on communication and 70% project documentation is paper based which delays the project activities and create hurdles to project delivery[1]. Further improvement in the communication within stakeholders could reduce the project failure. Open communication at all the levels could lead to innovation and better technical solution.

The recently developed web based models can provide the ability to exchange documents and share construction data among the participants.Such documents can be easily created, received, dispatched, stored and removed through the web. There are number of web sites and IT consultant firms who offer construction informatics services in the developed countries. In India, internet based project management methodology has not yet become popular [2].
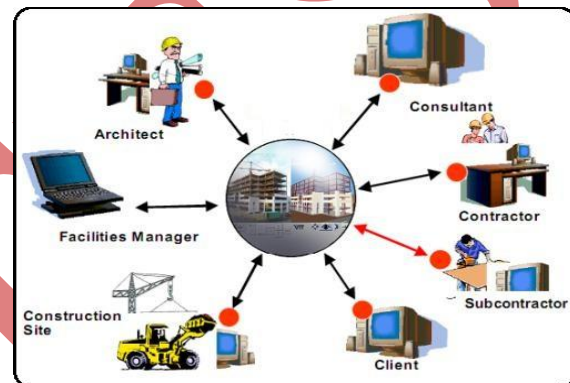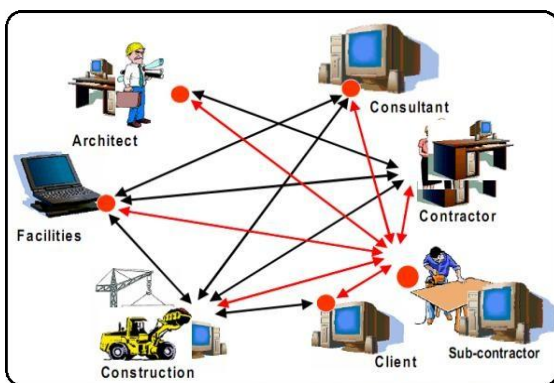


Fig 1.1Fragmented Nature of Construction Industry [3]     Fig 1.2Centralized Nature of Construction Industry.[3]

Many industries in India use the internet as a channel to communicate or to exchange information more effectively but construction industry lagging behind others. The increasing usage  of internet and the web based system can brought about change in the construction industry also by improved quality, competitiveness, profitability and better relation with project stakeholders. This development in project communications management can change the nature of construction industry from fragmented nature (Fig 1.1) to the centralized one (Fig 1.2).

Therefore, there is need to study various tools and techniques employed for the project communication management.

## II.          PROJECT MANAGEMENT TERMINOLOGY

### 2.1 Project:

A project is a temporary endeavor undertaken to create a unique product or service. Temporary means that every project has definite beginning and a definite end, unique means that the product or service is different in some distinguishing way from all similar products or services. Temporary does not means short in duration many projects lasts for several years.

### 2.2 Project Management:

Project management is the application of the knowledge, skill, tools and techniques to project activities in order to meet or exceed stockholders needs and expectations from the project. Project management sometimes used to describe on organizational approach to the management of ongoing operations.

### 2.3 Project Stakeholders:

Project stakeholders are the individual or the organizations who are actively involved in the project, or whose interest may be positively or negatively affected as a result of project execution or successful project completion.

The project key stakeholders on every project include:

2.3.1    Project Manager: The individual responsible for managing the project

2.3.2    Customer: who use the project product

2.3.3    Performing organization: the Enterprise.

2.3.4    Sponsor: Who provides financial resource

### 2.4  Key General Management Skill:

Management is broad subject dealing with every aspect of managing an ongoing enterprise among other topics, it includes.

2.4.1    Finance and accounting, sales and marketing, research and development, manufacturing and distribution.

2.4.2    Strategic planning, tactical planning, and operational planning.

2.4.3    Organizational structure, organizational behavior, personal administration, compensation, benefits and career paths.

2.4.4    Managing work relationship through motivation, delegation, supervision, team building, conflict management, and other techniques.

2.4.5    Managing oneself through personal time management, stress management, and other techniques.

General management skills provide much of the foundation of the building project management skills. They are often essential for the project manager. On any given project, skill in any number of general management areas may be required.

Following are the skill which highly likely to affect the most projects.Leading, Communicating, Negotiating and Problem solving.

Communicating is involves the exchange of the project information. Project communication is most important for the timely and successful project completion. Communication model is required for any type of communication viz. written, oral, formal or informal between the sender and receiver as shown below (Fig.2.1).
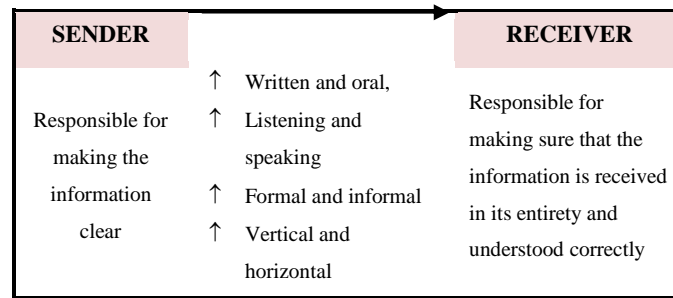
| SENDER | | RECEIVER |
|---|---|---|
| Responsible for making the information clear | ↑ Written and oral,<br>↑ Listening and speaking<br>↑ Formal and informal<br>↑ Vertical and horizontal | Responsible for making sure that the information is received in its entirety and understood correctly |

Fig 2.1:Communication Model [3]

## III. PROJECT COMMUNICATIONS MANAGEMENT

### 3.1  General

Project Communication Management is the knowledge area that employs the processes required to ensure timely and appropriate generation, collection, distribution, storage, retrieval and ultimate disposition of project information. Communication Management is a fundamental part of any organization and needs to be treated with care. It is investigated that Communication Management Process is a set of steps that needs to be adopted for every project in an organization. Using this Communication Process, we can communicate effectively at all times.

Communication process helps to undertake communication management for the team through step-by-step process. To keep the right people informed with the right information, at the right time, and then this process come in help.

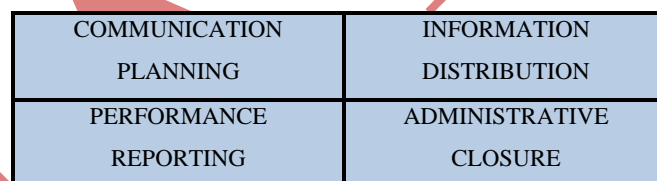| COMMUNICATION PLANNING | INFORMATION DISTRIBUTION |
|---|---|
| PERFORMANCE REPORTING | ADMINISTRATIVE CLOSURE |

Fig 3.1 Communication Management Process. [8]

The communication processes are, Identify Stakeholders, Plan Communications, Distribute Information, Manage Stakeholder, Expectations and Report Performance. Theseprocesses interact with each other and with processes in the other Knowledge Areas such as Project Integration Management, Project Scope Management, Project Time Management, Project Cost Management, Project Quality Management, Project Risk Management, Project Human Resource Management and Project Procurement Management.

### 3.2  Communication management process:

Communication management process is set of four steps viz. Communication planning, information distribution, performance reporting and administrative closure (fig 3.1). This paper focused with case study on one of step of project communication management i.e. - Information distribution. Remaining three steps are explained briefly.

### 3.2.1 Communication Planning:

Plan Communication is the process of determining the project stakeholder, information needs and defining a communication approach. The Plan Communication process responds to the information and communications needs of the stakeholders; for example, who needs what information, when they will need it, how it will be given to them, and by whom. While all projects share the need to communicate project information, the informational needs and methods of distribution vary widely. The important factors for project success is identifying the information needs of the stakeholders and determining a suitable means of meeting those needs.

Effective communication means that the information is provided in the right format, at the right time, and with the right impact. Efficient communication means providing only the information that is needed. On most projects, the communication planning is done very early, such as during project management plan development.

### 3.2.2  Information Distribution:

Information distribution involves making needed information available to project stakeholders in timely manner. It includes implementing the communication management plan as well as responding to unexpected requests for information. The information distribution process is described in detailed in three steps below (fig. 3.2).
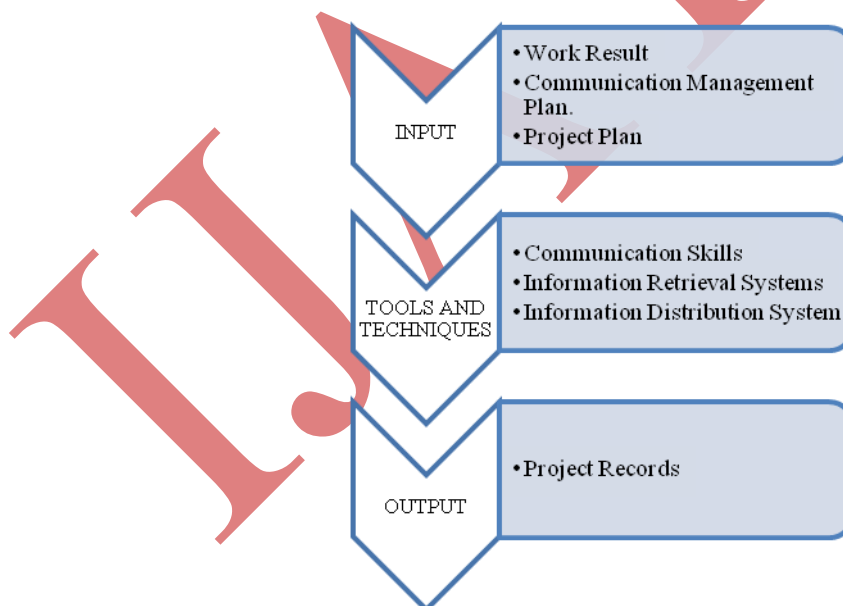


Fig3.2: Information Distribution in Communication Management Process. [8]

a)   Input for Information Distribution:

Work result is the outcomes of the activities performed to accomplish the project. It shows which deliverable have been completed and which have not, to extent quality standards are met, what costs have been

incurred or committed etc. is collected as part of project plan execution and it also useful into performance reporting.The project plan is a formal, approved document used to manage and control project plan execution.

Communication management plan may be formal or informal, highly detailed or broadly framed based on needs of  the project.it is distributed structure which details to whom information will flow, and what methods will be used to distributed various types of information. These must be compatible with the reporting relationship described by the project organization chart.

   b)   Tools and Techniques for Information Distribution:

*Communication skills:*

Communication skills are used to exchange information. The sender is responsible for making the information clear, unambiguous, and complete so that the receiver can receive it correctly and for conforming that it is properly understood. The receiver responsible for the making sure that the information is received in its entirety and understood correctly. Communications have many dimensions:

- Written and oral, listening and speaking.
- Internal (within project) and external (to the customer, the media, the public etc.)
- Vertical (up and down the organization) and horizontal (with peers)

*Information retrieval system:*

Information can be shared by the team members through variety of methods including manual feeling systems, electronic text data bases, project management software, and systems which allow access to technical documentation such as engineering drawings.

*Information distribution system:*

Project information may be distributed using a variety of methods including project meetings, hard copy document distribution, and shared access to networked databases, fax, electronic mail, voice mail, and video conferencing.

   c)   Output from Information Distribution:

Project records may be including correspondence, memos, reports, and documents describing the project. This information should, to the extent possible and appropriate, be maintained in an organized fashion. Project team members may often maintain personal records in a project notebook.

## IV. CURRENT STATUS OF IT IN CONSTRUCTION INDUSTRY

The today's world is in transition from industrial age to information age. The information technology (IT) revolution is making tremendous impact on the industry and trade by persistent technology innovation, massive growth in computer power & worldwide networking. There has been tremendous growth of activities in

Indian Construction & expansion over past years. Computers are widely used in construction industry for complete architectural planning, structural design, quality assurance, quality control & project management. Enterprise Resource Planning (ERP) has recently been   the   best   known   IT   offer   for   construction industry.

4.1 The    following   tendencies    can  be observed in Indian construction industry:

a.  Now, CAD facilities are available for detail engineering. Computer-aided stress analysis is widely used for optimization of design of structures. Much more project management software is used for managing project besides the designing and drafting tools.

b.  MS Office system 2007 with MS project and EPM (Enterprise project management family) project management element gives unified communications solution for communication.

c.  In Indian scenario integrated management have already appeared viz. ERP Hiserise, e-Site, Impuls 5. Microsoft offers dynamics AX software tool, SAP –PS (Project System) module.

d.  Additional internal windows SharePoint services website makes building site status reporting more precise.[2]

e.  Management  of  the  building  site  through web which makes it possible to acquire information from the  internet  (for  example,  tender  announcements,  supplier  price  lists  and  workflow).

f.  Some where the Construction activities are carried out with traditional system i.e. without help of IT. But it results the project delay, less productivity and uneconomic project phases.

These entireERP, SAP Module and MS Dynamix tool are suitable for the large scale construction industry by considering the factor itsimplementation and maintenance cost.

## V. CASE STUDY

### 5.1  General:

This case is selected for study the dedicated web based tools used for project communication process. Tools used for communication management viz. information distribution system and information retrieval system by web technology are focused in the study. Information is collected through discussion with the project crew at PandheInfracons Pvt. Ltd. Solapur at head office. Following is the summarized information of questionnaire discussed with the Sr. Project Engineer of PIPL. He works for billing and execution team under CE tech Team. They handle two projects billing related work for head office by adopting IT in their organization. Company inspires to move from traditional techniques to the modern one for timely completion and delivering projects to the client with desired quality.

They used web technology for the online measurement book and developed one web based tool for feeding the quantities of work done by sub-contractor for billing purpose. They use this technology in their organization to get user friendly platform rather than conventional clumsy paperwork documentation. The projects stakeholders are also collaborate by means of blackberry messenger to tech support and other works.

### 5.2  About Dedicated Web based Tool:

Company worked for many projects as contractor in the past. Most of the activities were carried out manually.For changing towards web based management companyidentified various phases like initiation, analysis, development, operation, monitoring and maintenance of the project.

Previously traditional billing system in which all entries in measurement book were made manually in L×B×D format was used. To minimize this laborious hand writing and payment problem,companymade 13 models like M1 to M13 after analysis of labour, material and other charges for one activity by team of experienced technical staff. Company finds out various activities for single model and their respective rates. After generation of model; in development phase, all the process of measurement book is linked to each other by web scripting language. One single platform is ready to handle four construction sites and even various models. Hencereduction in time required to perform measurement book process is possible. Development phase takes one and half month to develop web based tool.

A authorize person is only key person to customize the tool with secured authentication. The person in the head office able to add, view, edit and remove the new user, able to add new activity. Billing engineercan easily view and print the billing report and work done status report. Site persons have only permitted to data entry and preview the entered data with other disabled functions. Vendor coding system is also provided.

So, by this user friendly platform company will get information within short time, correct and productive. In maintenance there is only yearly subscription fees for domain space to the server is required because company haven't dedicated server for this tool. Only disadvantages factor is that company can't link this tool to the Tally ERP software for their accounts team.

### 5.3  Discussion:

PIPL is fastest growing construction company, specialized in mass housing projects. Organization enrolledits name in LIMCA book of record for fastest construction of sugar factory in 6 months and 6 days.

For its success, PIPL used IT in organization for various functional uses. Company used this tool basically for the billing purpose. Companydeveloped portal (Web Based Tool) by using web technology. The web based tool is yet to handle billing related data of various models of different sites, different geography. This web based tool can easily collaborate stakeholder for billing function with user friendly platform.

Projects of this firm are65% depends on this tool and remaining 35% is the department billing. This tool reduces the working time of any billing task from45 minutes to 11 minutes. Further time required for site visit is eliminated.

## VI. CONCLUSION

Project communications management is the process to release project information to project team members at right time, to right person to achieve the project goals. The project goals and the client requirementscan be achieved in better way by using IT and Web enabled technologies of fast communication.

Web technology can improve the construction management   techniques in Indian condition. Study analyze that use of information technology (IT) has a positive impact on construction firm performance.Project specific websites or tools are very helpful but it requires own IT infrastructure for better results and security. Better management of information and the knowledge gained from web based tool will enhance a company's potential to deliver project on or before project scheduled time with the expected profits and also nature of construction industry get changes from fragmented to the centralized.

Following are the advantages listed by company on the web based tool -

- Fast communication.
- Easy for documentation.
- User friendly interface.
- Team building and collaboration.
- Error minimization.
- It reduces paperwork.
- It reduces overheads.
- Easy updating of data.

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