WEB BASED CONSTRUCTION PROJECT MANAGEMENT SYSTEM

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Abstract: *Information Technology (IT) is now routinely used in the construction industry as a tool to reduce some of the problems generated by fragmentation. The use of IT improves coordination and collaboration between firms participating in a construction project, leading to better communication practices. Its benefits include an increase in the quality of documents and the speed of the work, better financial control and communications, and simpler and faster access to common data as well as a decrease in documentation errors. The main goal of this paper is to study the different objectives and application of Web in construction management.*

Keywords: **Construction; Information Technology; Internet; Web Based Construction Project Management.**

I. INTRODUCTION

The construction industry is fragmented due to the many stakeholders and phases involved in a construction project. This fragmentation has led to well documented problems with communication and information processing and has contributed to the proliferation of adversarial relationships between the parties to a project. This fragmentation is also often seen as one of the major contributors to low productivity in construction. Information Technology (IT) is now routinely used in the construction industry as a tool to reduce some of the problems generated by fragmentation. The use of IT improves coordination and collaboration between firms participating in a construction project, leading to better communication practices. Its benefits include an increase in the quality of documents and the speed of the work, better financial control and communications, and simpler and faster access to common data as well as a decrease in documentation errors. IT spending in Architecture/ Engineering/ Construction (A/E/C) firms has increased significantly during the past few years, indicating that A/E/C firms are increasing their interests in IT applications to facilitate construction projects. Among all IT applications, the Internet is the technology that best facilitates a collaborative working environment in a construction project. Walker and Betts postulated that the Internet, and more specifically the World Wide Web (WWW), will be the key to a change in global construction business in the near future and will impact professions, collaboration, and the construction business structure.

Its use as a communication medium can help information transfer occur faster and more effectively and enable new opportunities for the development of distributed

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systems that can cross organization boundaries and provide a unique opportunity for teamwork and workflow automation.

II. WEB BASED PROJECT MANAGEMENT SYSTEMS

The Web can overcome the incompatibilities of data formats through smart browsers and servers. Therefore, independent project participants using different hardware platforms can share the same system over the Web. As described in Skibniewski and Abduh, the advantages of Web technologies in construction can be broadly categorized into three areas: the support of relevant information services, communication between project participants, and engineering and management computing.

Recently, a concept of how the Web and its associated technologies can be used to manage construction projects has been widely by practitioners. This concept is often referred to as a Web-based Project Management System (WPMS) and leads to enhance construction project documentation and control and to revolutionize the way in which a construction project team conducts work.

WPMS is an electronic project-management system conducted through the Extranet, which is a private network that uses Internet protocols to transmit information. The system is only accessible by a project team, but team members can be located in different organizations. It basically provides a centralized, commonly accessible, reliable means of transmitting and storing project information.

Project information is stored on the server and a standard Web browser is used as a gateway to exchange this information, Project information includes details about the project, such as project participants, project e-mail directory, project description, and a photo archive of the project's progress.

Design information includes any information generated by the design team, such as CAD drawings, specifications, clarifications and changes, and punch lists.

Management information is developed by the project manager and includes meeting minutes, submittals and shop drawings, change order status logs, as built drawings, requests for information, requests for quotation, contract status logs, safety information, daily logs, and project schedules.

Financial information is developed by the accounting staff responsible for the project and includes cash flow, projections, requisition status, general ledger, and contract status reports. As project information changes, the database on the server can be easily updated with new data.

Members of the project team can then access the updated information via a digital user ID and password from remote locations at any time, eliminating the problems that occur in linear communication schemes. Since a closed network is used where no one is allowed to access the system without permission and everyone is identified (through an individual user ID and password), the system can automatically track who has seen what, and what comments or changes if any, they made.

It is also possible to introduce a project hierarchy into the system, which allows documents or areas of the project to be restricted to only people at certain levels of responsibility, etc. Hence, the mistakes caused by poor communication and the delays due to the time it takes to move documents and people around for approvals and meetings would be minimized.

WPMS is predicted to significantly improve the speed and quality of communication among project participants and promotes collaboration and coordination in construction projects.

Currently, there are three options in regard to WPMS implementation. The first option is to develop a customized WPMS in-house by hiring either a consulting company or programmers to create a system. The second is to develop a WPMS by purchasing commercial web-enabled packaged software and installing it on a company's internal server. The third is to rent/lease a completely developed WPMS from an Application Service Provider (ASP) for a usage fee, which is normally charged per project, per the amount of computer storage space required, and/or per user.

III. DEVELOP CUSTOMIZED WPMS IN-HOUSE

The customize Web bases Project Management System can be developed by the Project management Consultancy according to its Required functions and the customised requirements.

IV. DEVELOP A WPMS BY PURCHASING COMMERCIAL WEB-ENABLED PACKAGED SOFTWARE

Examples of this software include Microsoft Project from Microsoft, P3e/ck and sureTrakk from Primavera, Prologk Project Pack from Meridian Project Systems, WebProjectk from Novient, and Teamflow from CFM.

V. DEVELOP A WPMS FROM AN APPLICATION SERVICE PROVIDER

''Project Management System-Application Service Provider (PM-ASP)'', is becoming popular because it requires minimal technical, financial, and human resources to develop and operate. Since PM-ASP is outsourced to an ASP, it requires no effort to develop and maintain the system in-house, involves comparatively low initial investment and overhead cost, and is convenient for keeping up with cutting-edge technology. Therefore, it is a viable solution for a small or mid-sized A/E/C firm that does not have enough resources to maintain an in-house IT department and/or a sophisticated networking infrastructure. In addition, PM-ASP is also capable of performing electronic commerce, such as online bidding and procurement, which are difficult to develop and conduct through an in-house WPMS.

A. Features of PM-ASP

PM-ASP has many features such as, Document management, Project workflow, Project directory, Central logs and revision control, Advanced searching, Conferencing and white-boarding, online threaded discussion, Schedule and calendar, Project camera, File conversion, Printing service, Website customization, Offline access, messaging outside the system, Wireless integration, Archiving of project information, Information service, Financial service, E-bidding and procurement.

B. Benefits of PM-ASP

PM-ASPs offer numerous advantages over the current inter-organizational information infrastructure by providing access to project data and communication that is platform and application-independent. All that is required is Internet access and a Web browser. PM-ASPs are also location-independent since the systems can be accessed wherever there is Internet access and a Web browser. Communication can be either synchronous or synchronous, and individuals can access project database anytime or multiple team members can collaborate in

real-time. In addition to enhancing communication and access to project information, PM-ASPs also provide several potential advantages over in-house WPMS. Following are some of the advantages are Cost advantage, Outsourcing advantage, Competition among IT professionals and ASP's competition.

C. Barriers to PM-ASP implementation

Besides the benefits that PM-ASPs may provide, some important barriers to implementation still exist and should not be overlooked. These barriers need to be addressed in order to increase public confidence in adopting PM-ASPs in construction projects. The literature shows that these barriers include a wide range of issues that can be summarized as follows.

Difficulties in quantifying costs and benefits, System reliability, System security, Legal issues of electronic transactions, Lack of software interoperability, Data ownership after project completion, Internet access and bandwidth problems, Resistance to change, Password barrier, Density of communication channels, Team tools and problems of something for Everyone and Collaborative maturity.

VI. CONCLUSION

- As for the developing country like India, the rapid intention on Project Management is concern of Construction Industry, so that Web Based Project Management System become most effective and Economical tool for Construction Management.
- The WPMS is also most important and Useful for large Infrastructural projects and for the Projects of Multinational Companies.
- It can be concluded that PM-ASPs present significant benefits to the construction industry, but their successful implementation is still hindered by barriers, for the most part nontechnical.
- Unlike other technologies, PM-ASPs are very much concerned with the exchange of information across the project life cycle, and their successful implementation therefore will not only require a state of readiness within one organization but also within all organizations involved in the construction processes, which makes the successful implementation of PM-ASPs difficult to be planned and managed.
- In order for the construction industry to successfully embrace PM-ASPs, many factors such as technology, process, people, procurement, legal issues, and knowledge management must be considered equally.

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