1. Introdaction

While most professions have been quick to embrace the information age, the construction industry has fallen behind in using new technology. However, web-based systems, designed specifically with public works professionals in mind, are emerging to help improve project management and overall efficiency.

Time is among the precious commodities on construction sites. Rarely is there enough time to complete all facets of a project on deadline. Under constant pressure to complete projects on time and on (or even under) budget, construction managers also face difficulties communicating with all of their contractors, subcontractors and managers. Technology can aid the process by providing construction managers with communications tools, Web-based systems and other time- and money-saving devices.

2. Web –based construction

A web-based management system creates a "paperless" environment where electronic files are transferred from one person to another. The project team can access specific project information in an accurate, timely manner from practically anywhere at anytime. These systems significantly reduce the reproduction and paper cost consumed throughout the lifetime of a project by eliminating the need for most hard copy documents.

Software developers have focused on creating web-based project management applications that are tailored to the construction industry. It is important to distinguish between web-enabled and web-based applications.

Web-enabled applications are primarily client-server software that has web publishing capabilities. These software applications are loaded onto your computer server and utilize

the server space to store project information. Since the "factory floor" of the construction industry (jobsites) are many and temporary, the short term hassles of deploying the hardware infrastructure and on-site software configurations are amplified. Web-enabled project management solutions are becoming more obsolete as software vendors dedicate more of their resources to developing web-based software applications.

Web-based applications provide a platform for better project communication and collaboration without being tied to a specific network or software application. A standard web browser (ie. Internet Explorer) is the interface for project information. These applications provide instantaneous communication, collaboration, and secure access for project participants. Buzzsaw, Constructw@re, and e-Builder are just some examples of web-based systems available today. Each application develops their own set of standards and procedures for managing project documents.

The alternative to buying a web-based project management application is to hire a web developer to create a customized management system for your organization. A customized system can be tailored to follow pre-existing organizational structure and procedures, collecting specific data for company reports and forms.

3. Use of web in construction industry

From the numerous Web-based construction project management applications the most commonly used are:

On-line Design Studios

The virtual design studios allow designers and experts from different places to interact

using audio and video conferencing. They can also share the same screen and same program thereby entering the same virtual reality space. This allows discussing virtually any matter without the need to travel.

On-Line Bidding Systems

One-way electronic bidding systems already are in wide use. These allow bid packages to be downloaded from a Web site with bids returned on paper, sometimes with a requirement that files on disks accompany them. However, recently some companies have developed on-line systems to facilitate Two-way bidding, i.e. bid documents can be submitted as well as edited on-line before the bid-closing date. This will reduce lot of paper work resulting in time and cost savings.

On-line Project Administration Systems

The on-line project administration systems can provide round the clock information about the project such as project status; directory of contractors, consultants, vendors and suppliers; project drawings and specifications; project control reports and the facility to submit on-line change orders. A number of construction companies are adopting such systems to facilitate better communication between the head office and the remote project sites, which could result in both time and cost-savings. One excellent example of the use of this technology is the “Ohio School Facilities Commission (OSFC), Columbus, has been using a web-based management tool to develop communications web sites for construction projects at local schools since1998. OSFC provides funding, management oversight and technical assistance to local school districts for construction and renovation

of school facilities throughout the state. The commission now requires each construction manager with whom it works to communicate and report information via the Web.

OSFC uses the web site to: * manage financial information; * maintain and archive digital photos of the construction; * communicate with all team members through document file storage of meeting minutes, drawings and safety notices; * manage and advertise procurement opportunities with bid calendars; * update contacts for each project; and * keep the public informed of progress." (www.cmw.osfc.state.oh.us.)

On-line Building Products Catalogues

On-line building product catalogues, also known as Web-based catalogues have become major building product information sources on the web. The content of information in these catalogues include performance data, standards and specifications, installation instructions and the facility to place on-line orders. Most on-line catalogues organize and present product information in a format and detail that is useful is construction documentation thereby saving time and effort Moreover, they allows CAD users to call up graphical directories of elements used in their current design project and examine product descriptions and specifications that are available on the WWW.

Project Monitoring and Control Through Web Cams

Using dedicated video cameras to remotely monitor construction sites through the Internet may seem like a small jump from ordinary security surveillance, but the Web-cam's unblinking eye may be key to a project management revolution. Among other things, the round-the-clock digital views and archives of project progress are serving as

impartial dispute arbiters. The Web cams provide continuous pictures regardless of weather and safety conditions and save hours or even days of travel time. Moreover, all images are recorded for archiving and have date and time stamps. Web cams could become more popular as project participants recognize their importance in project monitoring and dispute resolution. Web cams typically can help resolve critical-path delays caused parties or by an Act of God such as floods. They can also be used to stop workers' compensation fraud.

4. Conclusion

As technology continues to evolve, making tasks easier and faster, the transition to an Internet-based standard is becoming more appealing to companies. Companies are realizing that the web can provide a productive and competitive advantage. The sooner a firm implements a web-based system, the better prepared the firm will be to take advantage of future technological advancements.

5. References

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