Chapter 7

Web Enabled Design Collaboration in India

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ABSTRACT

Designing large scale real estate projects often requires collaboration between consultants and agencies that are located in different geographical areas. The added constraint of geographical distance to a design approach that already involves multiple participants makes design collaboration a particularly challenging task. This study hypothesizes that design collaboration could benefit from harnessing web technologies. Organizational Risk Analyzer (ORA) software was used to identify the key factors of a collaboration network in a design project located in Kolkata, India. The web enabled internet forum system used was compared with the more traditional system of collaboration using mail. The collaborative network factors like connectedness, density, diffusion, centralization degree, and the node level factors like closeness centrality, eigenvector, betweenness and Burt constraint indicate that internet forums provide a more efficient tool of collaboration than traditional mail network systems. A simulation shows that the forum network operated even in an adverse condition, for example, when the project manager, a key member of the collaboration team, was unavailable.

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INTRODUCTION

Issues

The building construction industry has been recognized as a project-based business that delivers a one-of-a-kind product. Despite superficial similarity in the end product and the design approach, the detailed engineering of most building projects are uniquely different. The information supplied by the architect and the consultants provide the knowledge based on which the builders and contractors deliver the product.

Jerrard et al. (2002) found that architectural design is a creative service that requires a unique solution and unlike consumer products, it cannot be tried and tested before use. Since it delivers a high value product, stakeholders tend to concentrate more on the quality of the end product rather than the quality of the service. Yet, the construction industry is a knowledge intensive industry and efficient delivery of knowledge among the stakeholders is one of the key factors for success of a project. In fact, Fedorowicz, Ballesteros, and Meléndez (2008) studied the opinions of numerous researchers about the tools for collaboration as a part of evaluation of research articles and found it imperative to use only tested tools for creativity and innovation in collaboration. Large building projects in the present globalized business scenario, often deals with multiple consultants, contractors and suppliers from different continents. Proper tools for knowledge management and information technology (IT) play a critical role in managing such projects.

However, small and medium businesses have not yet picked up e-collaboration as a major mode of communication and innovation. Cerdán, Acosta, and Nicolás (2008) found that only 37% out of the 310 numbers surveyed firms had only one type of communication technology within their intranet. Additionally, the web-based knowledge management has found to be dependent upon the role of culture in an organization (Leidner, Alavi, & Kayworth, 2006) and the construction industry has particularly been reluctant to pick up on new management paradigms. Insiders usually see these as complex forms of established business principles that offer little added business value. Nikas and Poulymenakou (2008) investigated the difficulties of adapting web-based collaboration support in the context of Greek construction industry. They found it impossible to leave the technology intact if the performance goals were to be achieved. The complexity of the construction practice and the lack of established standards and protocols make adoption of new IT tools difficult. It is sometimes argued that the building industry is highly fragmented and smaller firms can not afford to invest adequately for successful implementation of new systems. Shen et al. (2009) found that despite the emergence of IT to assist construction management the industry’s productivity has remained low in USA. In the context of the Indian construction industry, the adoption rates of IT tools is even lower. Ahuja et al. (2009) reported a survey of IT use in building project management across India. It was found that external collaborative use of IT was more than the internal use only in about 3% of the surveyed organizations. In fact, comprehensive web based PM solution had not been adopted by any of the respondents.

There is unfortunately no fixed or even widely used tool for knowledge sharing in construction industry. Leiden, Loeh, and Katzy (2010) conducted case studies and compared a project management case with two other types of collaboration. They found extensive additional tool support for project management issues are necessary for effective management. Kittowski and Siegeris (2010) suggested integrated support for different types of collaboration environment in contrast to several individual applications for a seamless transformation of a group from one type to another in a consistent user interface. Fernandez, Alto, and Stewart (2006) studied a web based collaborative decision support tool used by NASA.