A Survey on Users' Perspectives to Functionalities of Web-Based Construction Collaboration Extranets

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ABSTRACT

Construction collaboration extranets (CCEs) provide various functionalities depending on the vendors' origins, history, experiences, and financial status. Previous research has listed and described the functionalities that extranet systems can be capable of providing. However, no publication was found so far to systematically analyze users' perspectives to the provided functionalities. This article is to bridge this gap through a questionnaire survey to the users. It aims at examining user's attitude to functionalities of CCEs. The result may be useful to information system vendors, end-users and researchers involved in CCEs development and implementation.

KEYWORDS

Construction Collaboration Extranets, Functionality, Survey, User's Perception

1. INTRODUCTION

Web-based Construction collaboration extranets (CCEs), or sometimes called project extranets, have been adopted in improving the efficiency and effectiveness of information management, communication and collaboration in the construction industry (Becerik and Pollalis, 2006). CCEs make use of the advantages of the Internet for being a global network that is not restricted by location, time or different computer operating systems. The benefits gained from using CCEs include: no extra hardware and software investment (Zou and Roslan, 2005); application and location independent (Nitithamyong and Skibniewski, 2004); up-to-date information retrieval and improved communication (Zou and Roslan, 2005); cost and time effective (Tam, 1999, NCCTP, 2006); and some intangible benefits like few claims and greater flexibility (Wilkinson, 2005, Wilkinson, 2008).

To deliver these benefits to users, current CCEs have supplied a number of functions including document management tool, workflow management tool, collaborative tool, organizational tool, reporting and data exporting tool and maintenance tool (Zou and Roslan, 2005). The functionalities

supplied by a certain product vary greatly depending on the origins, history, and financial status of the vendors (Wilkinson, 2005), in the form of a single service to fully hosted service (CICA, 2003).

Previous studies have attempted to gather the functionalities of CCEs (Nitithamyong and Skibniewski, 2004, Wilkinson, 2005, Becerik, 2004), produce a features list or check list (CICA, 2003, Breetzke and Hawkins, 2002), and analyze their availability and distribution in some sample systems (Liu et al., 2011). These works were helpful to identify the available functionalities of CCEs but they were mainly from the system vendors and didn't reflect the users' perspectives. In this regard, Ruikar et al. (2005) had tried to gain an insight from the users' perspectives on the use of such systems. Lin et al (2013) studied the factors effecting on user satisfaction. But no publication was found to study the users' attitude or choices on the functionalities that CCEs are capable of providing. This is unsatisfactory as effective function management is particularly crucial for the end-users to understand the functionalities provided by the respective systems prior to adopting and implementing the technology, as selecting wrong system will surely result in time-wasting and other costly problems (Raol et al., 2002).

This paper is an attempt aiming to investigate from users perspectives based on a questionnaire survey. The results will provide an empirical evidence of user needs to functionalities of CCEs

2. FUNCTIONALITIES OF CCES

In CCEs, the main and purposeful function is to share project documents among project participants. Current systems are not only allowing sharing the documents through the network, but also enabling users to manage the files locally or remotely without installing any extra software. In addition, the latest CCEs provide many supporting or additional functions to facilitate the information transfer and communication tasks, to streamline the workflow and to collaborate with the other partners during construction process, with some customized environments. Some extra functional modules, e.g. e-tendering service, are introduced to the systems and provide additional functionalities to the end-users.

In this research, the authors use the categorization given in Liu et al. (2011), which grouped all functionalities into 4 categories: System administration, Document management, Workflow management and Communication tools plus add-ons. The hierarchical and interrelated structure of CCE, functions and features can be illustrated as Figure 1. More details about the functions and features can be found in Liu et al. (2011) and Charalambous et al. (2012).

3. RESEARCH METHODOLOGIES

3.1. The Questionnaire Survey

Survey is a commonly used method for behavioural research (Sommer and Sommer, 2002), via a lot of methods, such as interviewing, questionnaires, or by observation (Zowghi and Coulin, 2005). In this research, the authors adopted questionnaire survey to capture users' perspectives to CCEs functionalities.

The questionnaire of this research was divided into three main sections. Section one (title and introduction) aims to explain what this research is for and how this survey is undertaken. It also encourages the respondents to continue completing this questionnaire survey. Section 2 (general information) is concerned with the collection of general information of the respondents and their organizations. Section 3 (user attitude elicitation) is the major part and is aiming at the actual goal of this survey. The question asked and all items in questions in line with the functions and associated features given in Figure 1. In addition, a thank-you part and returned methods are attached to the last part of the questionnaire.

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