Quantitative Evaluation on Organizational Knowledge Implementation in the Construction Industry

S. B. Kim*

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Abstract

One way of improving organizations is by implementing knowledge which can be obtained from research products. Although there are many valuable research products available which have tremendous potential to improve the organization from research, many of them have not been implemented to a significant extent on real world projects. This study is initiated by the willingness to validate the importance of knowledge implementation in the context of knowledge management. Developing a quantitative evaluation index of knowledge implementation is the main objective of this study. In developing the index, the Construction Industry Institute (CII) sponsored research products and its member companies were used as main data sources. The index, named as CII Knowledge Implementation Index (CKII), was used to evaluate the organizational knowledge implementation level among U.S. based firms in the construction industry. Analysis results show that there is a wide range of implementation levels among survey respondents. Relationships between research participation and knowledge implementation are also examined in this study but the analyses results failed to show statistical significances between the two factors. This study is one of the first attempts to quantify the knowledge implementation at the organizational level in the construction industry.

Keywords: knowledge implementation, knowledge management, organizational implementation, construction industry institute

1. Introduction

The nature of the construction industry has become increasingly more competitive and organizations need to continuously improve in order to remain successful (Kale and Karaman, 2012). One way of improving organizations is by implementing knowledge or new practices which can be obtained from research products typically developed by various universities and research institutes such as the Construction Industry Institute (CII). Although there are many valuable research products available which have tremendous potential to improve construction project performance, as well as the organization’s business processes, many of them have not been implemented to a significant extent on real world projects (Smith, 1995).

Despite the importance of the implementation effort, there is little research focused on the implementation of existing research products or measuring the degree of the implementation effort. CII has identified the importance of implementation and instituted the Implementation Strategy Committee (ISC), which concentrates on the implementation of CII knowledge. CII also has conducted some research to increase the level of implementation of knowledge from CII research products. A majority of research on knowledge implementation in the construction industry focuses on a single system or project such as an IT system (Yu, 2012) and economic model (Kwon et al., 2012). However, this study concentrates on the organizational level of the knowledge implementation.

2. Research Objectives and Methodology

The primary objective of this research is to assess the organizational implementation process and the impact of knowledge implementation at the organizational level. In order to archive the objective, this study attempts to develop a survey to assess the knowledge implementation level within an organization. Based on the survey data, an index, named as CII Knowledge Implementation Index (CKII) was developed to quantify the level of organizational knowledge implementation. This study uses the CKII to assess the level of organizational knowledge implementation level among U.S. based construction contractors and owners. In evaluating organizational knowledge implementation, difference between owners and contractors is analyzed from the viewpoint of statistical differences. In addition, this study attempts to identify relationships between the level of research participation and organizational knowledge implementation. The level of research participation is derived from the organization’s CII participation since CII is a primarily research institute. The number of years with CII membership and the number of

*Member, Associate Professor, Dept. of Civil & Environmental Engineering, Dongguk University, Seoul 100-715, Korea (Corresponding Author, E-mail: kay95@dgu.edu)
voluntary participation in CII research activities were used as variables representing the level of research participation.

Survey questionnaires and statistical analyses are the main tools for this research in analyzing the survey data. SPSS® and Microsoft Excel® were used as the analysis software packages for this study. Analyses applied to this study include summary statistics with normality tests, regressions tests, box plots, and independent samples t-tests.

2.1 Survey Questionnaire

The survey questionnaire was a fundamental part of this study in measuring organizational implementation level. The survey was intended to assess the organizational implementation effort and the survey contained 78 questions in eight categories, which correspond to the first eight implementation steps specified in the CII Implementation Model as described in section 3.2. Each category had a different number of questions focusing on the specific issues related to corresponding implementation step. Most questions had a Likerts’ one-to-five scale while the others were yes/no questions. Participants also had a choice of not answering the question by selecting a ‘Not Applicable’ option. The survey was distributed to 88 organizations in the construction industry and their composition is summarized in Fig. 1. Among 88 contacted samples, 41 organizations completed the survey. In Fig. 1, IC represents ‘Implementation Champion and it is explained in section 3.2.

3. Literature Review

3.1 Construction Industry Institute (CII)

CII, which sponsored this study in data collection, is a research organization that was formed in October 1983 with the mission of improving the competitiveness of the construction industry (CII, 2013). The 28 charter members were responding to the recommendations from a study by The Business Roundtable entitled the Construction Industry Cost Effectiveness (CICE) Project. That five-year study of the industry and its problems specifically recommended that an organization be created to take a leadership role in construction research. The CICE participants included more than 250 industry leaders, practitioners, and academicians. They recognized this particular recommendation as an opportunity for companies and academia to work together for the improvement of the industry (CII, 1998).

As a unique consortium of owners, contractors, and academia, CII has produced many research products to help its member organizations find better ways of planning and executing capital facility projects. Member organizations staff CII research teams to provide guidance for specific research activities which are conducted in conjunction with different universities.

CII has established over 100 research teams working in collaboration with over 30 research universities since its initiation at The University of Texas at Austin in 1983 and its effort has resulted in over 250 publications. The publications are offered to the construction industry to benefit the CII member companies and the industry itself by disseminating findings from various research activities.

CII has also identified the importance of implementation of this research and has organized the Implementation Strategy Committee (ISC) which concentrates on the implementation of CII knowledge. To start off the implementation process, CII recommends that all CII research teams write an implementation resource which provides a summary of how to implement their research product in the real world. However, each implementation resource typically focuses on only one process, and it has been difficult to measure the implementation effort at the organization level. There are many critical factors that affect the success of construction projects and each research product typically focuses on only one of them. In order to gain maximum benefit from research products, it would be beneficial for organizations to have a method to assess their knowledge implementation levels by identifying areas in which they are excelling, or on which they need to put more emphasis, and on ways to improve those areas.

3.2 CII Implementation Model

The CII ISC supports comprehensive, effective use of proven CII products by member organizations and the industry in general. Implementation of CII Best Practices is driven by the member organizations and supported by CII. Upon joining CII, each member organization makes a strong commitment to improve its business performance through the adaptive use of CII