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A Study on the Necessity for the Standardization of Information Classification System about Construction Products

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Abstract: The widespread dissemination of the green building certification system has led to the ongoing development of information management technologies with the aim to effectively utilize construction product information. Among them, a data crawling technology enables to collect the data conveniently and to manage large volumes of construction product information in Korea and overseas. However, without a standardized classification system, it is difficult to efficiently utilize information, and problems such as an additional work for classifying information or information-sharing errors. Therefore, this study suggests to present a necessity for the standardization of the information classification system through expert interviews, and to compare construction product classification systems in Korea and overseas. This study is expected to present a necessity for the effective management of construction product information and the standardization of information-sharing with regard to various construction certifications.

Key words: standardization, information classification, construction products data, data crawling

1. INTRODUCTION

The beginning of the Fourth Industrial Revolution has led to the development of various technologies. Among them, big data is particularly emphasized as a technology with a potential to provide various information and convenience by analyzing unstructured data, which had not been used as subjects of analysis in the past. In addition, data crawling technology, which collects and stores web-based data, allows the automatic management of information that requires regular updates. In the case of construction product information, expiration dates are imposed on eco-friendly material certification and new products are continuously being developed. Thus, the establishment of a web-based database using the aforementioned technologies will allow the utilization of a much larger volume of information for the certification process than was previously available. However, as the information classification systems used in Korea and overseas are not standardized, it is difficult to effectively utilize and manage the collected information.

Interviewing five experts who have worked in construction-related positions for over ten years presented three potential improvements in order to utilize the information collected using data crawling technology in actual operations. First, in Korea, there is no standardized construction classification system controlled by the government, and therefore, it was suggested that a new classification system was necessary in order to systematically store the collected information. However, no actual plan for improvement has been determined, since the development and establishment of a new classification system requires a large amount of expenses and labor. Second, it was suggested that utilizing the collected information for certification purposes requires the definition of the information required for certification prior to the collection of information, and the collection of information in uniform formats. Lastly, as more interested parties become involved in a project as it progresses, it was suggested that

there is a need for a standardized information-sharing process to share the collected and generated information.

Therefore, this study aims to examine and compare the situations in Korea and overseas with regard to the construction information classification system, among the potential improvements suggested by experts. Moreover, it suggests the problems that may arise as a result, and presents a research direction to improve such problems.

2. CONSTRUCTION INFORMATION CLASSIFICATION SYSTEMS IN KOREA AND OVERSEAS

Construction information classification systems in Korea and overseas can be largely divided into two types. The first consists of classification systems according to construction implementation activities, such as the Construction Information Classification System developed by the Korea Institute of Civil Engineering and Building Technology. The Construction Information Classification System classifies information based on subjects into Facilities (F), Spaces (S), Elements (E), Works (W), and Resources (R). Among these, resources are subdivided into Materials (M), Equipment (Q), and Labor (L). The standard classification of materials follows the 11 digit system under the product list system of the Public Procurement Service. The said classification system recommends its usage in accordance with the provisions stipulated under Article 29 Paragraph 3 and Article 55 Paragraph 3 of the Enforcement Decree for the Construction Technology Management Act, although it is not currently being used as the standard.

Next, North America uses the Master Format, which is a type of SCI format. The Master Format has been selected as the industrial standards guideline of the Department of Defense in the United States and as the national standard specifications in Canada, which led to its usage as a common system and writing standard for the classification of data on materials, as well as writing estimates and specifications[2]. Currently, its latest version is MasterFormat® 2016, which is structured into Group, Subgroup, and Division levels. It is largely divided into Procurement and Specification, and Specification is comprised of 48 divisions in the subgroups of General Requirements, Facility Construction, Facility Service, Site and Infrastructure, and Process Equipment. Although the two classification systems have the identical structure of upper, middle, and lower categories, each classification system was formed in reflection of the construction implementation activities in each country, and therefore differ in the specific content of each code and subdivisions.

Another type is the classification system based on materials, and the Korean version uses the product list system of the Public Procurement Service. As of January 2006, the classification has been amended based on the United Nations Standards Products and Services Code (UNSPSC). The new classification code consists of an eight-digit product list number comprised of a four-tier structure with a two-digit code for each tier, as well as an eight-digit unique item number (Public Procurement Service, 2017). It uses the same product list number as the UNSPSC, and reserved codes can be assigned below the product list number in consideration of the circumstances in Korea.

Next is the United Nations Standards Products and Services Code (UNSPSC). Developed by the United Nations Development Program to facilitate electronic commerce, this classification code is the most widely-used standardized classification system in the world. It is divided into a four-tier structure consisting of Segment, Family, Class, and Commodity, as well as Business codes under Commodity in accordance with the characteristics of each product. However, the subordinate code under Commodity may be autonomously determined, and therefore, the code may differ according to the country, which may result in disputes.

The Harmonized Commodity Description and Coding System, which is used to ensure the consistent information-sharing between countries that have signed a Free Trade Agreement, has resulted in disputes due to the same aforementioned problem. As countries may autonomously determine the remaining code other than the six-tier code structure in the said system, there has been an increasing number of disputes and losses as each country has designated different product codes for the same product[3]. Therefore, it is predicted that the failure to introduce a plan to standardize classification systems for data management with regard to construction product information may result in enormous losses and an unnecessary increase in work due to information-sharing errors.

3. CONCLUSION

This study proposed the standardization of construction information classification systems, standardization of collected information items, and standardization of information-sharing processes, as potential improvements for the certification process to utilize construction product information collected using data crawling technology through expert interviews, and presented the necessity for the standardization of classification systems by comparing the construction information classification systems used as standard in Korea and overseas. In addition, this study examined preceding research that resolved the discrepancies in international unified product classification systems through the ontological method, and presented the problems expected from the failure to standardize construction information classification systems. Follow-up research will analyze specific problems incurred through cases of construction information classification systems and propose relevant solutions. This study is valuable as basic research that suggests the necessity of the development of techniques to standardize classification systems for construction products, as well as to standardize construction products used for certification purposes.

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