

Identifying Construction Problem-Solving Patterns of Lessons Learned with Text Mining Method

張佩倫, 余文德, Lee, S. M.

Construction Management

Architecture

wenderyu@chu.edu.tw

Abstract

Many engineering consulting firms have adopted knowledge management systems (KMSs) as a tool to record the knowledge and experiences of their engineers and staffs. It was found from previous research that similar construction problems were encountered and resolved by the same firm. The most commonly adopted form of such kind of knowledge and experiences is historical lesson-learned files (LLFs). It is very beneficial to identify the underlying patterns of historical LLFs, so that the retrievals and reuses of such knowledge and experiences can be more efficient and effective.

This paper presents a text mining method that expedites the identification of construction problem-solving patterns from 908 historical LLFs recorded in the KMS of the case engineering consulting firm. Various text mining algorithms are tested to find out the appropriate ones that are most effective in the mining of problem-solving patterns. Domain experts are consulted to verify the results of text mining. The reapplication of the identified problem-solving patterns is demonstrated to compare the proposed method with the existing method both in efficiency and effectiveness of construction problem solving.

The results of the present research show that the text mining and data mining methods have the potential to provide a solution for identifying the patterns of construction problem solving. With such patterns, the construction engineers and managers are better equipped and supported as they are encountered with the numerous emergent problems in their daily works.

Keyword : problem solving, knowledge management, lessons-learned, text mining, data mining.