A Pilot Study on the Application of TRIZ to Problem-Solving of Engineering Consultants

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Abstract

Consulting engineers are dealing with emergent problems in their daily works using different approaches such as face-to-face meetings, expert consulting, and information retrieval via information systems, etc. The advancement of information technologies has made possible the accumulation and retrieval of the historical lesson-learned file (LLF) from previous experiences of problem solving. Using of LLF has been proven to be very beneficial for the construction organizations in time-saving, cost reduction, and quality improvement of the performed project. According to previous study, the LLF provides valuable knowledge that can be applied to solve similar problems in different engineering domains. Such an approach highly assimilates a different alternative for problem-solving called TRIZ (the Russian acronym for Theory of Inventive Problem Solving). As a result, the present research aims at investigating the applicability of TRIZ to the LLFs of a local leading engineering consulting firm. After screening, 64 most suitable LLFs were identified from 908 samples. The systematic process of TRIZ was applied to analyze the 64 identified LLFs to identify the most frequent patterns and rules of engineering problem-solving. The analysis results show that "Prior action" was the most recommended inventive principle. However, "information retrieval", which is not included in TRIZ, was found to be most frequently adopted method for engineering problem-solving. The study also summarizes the most commonly encountered improved and worsened engineering parameters and the associated most adopted inventive principles for engineering problems, so that they can be adopted apply to solve specific types of construction problems more efficiently and effectively.

Keyword：lessons-learned, construction problem solving, TRIZ.