

EXPLORING UNDERLYING PATTERNS OF EMERGENT PROBLEM-SOLVING IN CONSTRUCTION WITH TRIZ

張佩倫, 余文德, 鄭紹材, 李順敏

Construction Management

Architecture

shaotsai@chu.edu.tw

Abstract

Construction engineers and managers are dealing with emergent problems in their daily works. The problem-solving experiences, usually recorded as historical Lessons-Learned Files (LLFs), accumulated from previous projects are applied repeatedly in similar problems encountered. Such methodology is very similar to the Theory of Inventive Problem Solving (TRIZ) widely adopted in technology innovation fields. The similarity inspires the authors of this paper to develop a preliminary Model of Engineering Problem Solver (MEPS) based on the similar methodology of TRIZ adopted by Altshuller to explore the underlying patterns of problem solving for emergent construction problems. 908 historical LLFs were collected through the Knowledge Management System (KMS) of a top ranked engineering consulting firm in Taiwan. The collected LLFs record the problem descriptions, problem classification, solution description, and the evaluation of the implemented solution, which store the underlying rules or patterns of problem solving that they are ready-for-use by the engineers/managers. By applying the same procedure of TRIZ, a preliminary MEPS is developed with 15 identified management parameters, a contradiction matrix, and 16 problem-solving principles. Two real world problem-solving cases are selected to test the preliminary MEPS. The testing results show great potentials of the proposed MEPS in automated engineering problem-solving. Moreover, the proposed MEPS provides a systematic method for efficient knowledge acquisition and accumulation in engineering consultants.

Keyword : Problem-solving, Knowledge management, TRIZ.