Chapter 14

A New Approach for Reinforcement of Project

DEMATEL–FMCDM–TODIM Fuzzy Approach

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ABSTRACT

This chapter describes how an effective work towards software project risk plays a vital role in determining the accomplishment of any project. In this chapter, the aim is to associate fuzzy criteria decision-making based on the approaches for the development of an assessment framework. This framework will be helpful in terms of identification and ranking the software risk according to its characteristics which will be helpful in decision-making of a software lifecycle. For the assessment for the risk of a project, there is an integration of fuzzy decision-making trial, evaluation laboratory trial and fuzzy multi-criteria decision. This new method proposed will be effective in terms of ranking and as well as to measure the software risk factors.

INTRODUCTION

In order to handle any software project and make it successful it goes to through various processes such as documentation, application maintenance, debugging and testing. As a result of acute research attention, several works were proposed...
to improve software project management techniques. To measure any software product for designing any software the factors which are considered are scope of the project, the technology used, team development and quality of the products (Boehm et al., 1978). While working in the software development life cycle several unavoidable risks like business, technical and project risk occur so there is urgent requirement of project management in a project. Now, the challenging situation which arises is to manage the risk factor and performance of the software product throughout the development of software project life cycle (Kahneman et al., 1979).

The new approach which is introduced in this chapter is based on statistical based predictive techniques. Further many approaches were designed but where having some limitations. To overcome this problem (MCDM) multi-criteria decision-making technique is introduced (Arshadi et al., 2014). MCDM techniques such as Fuzzy Multi-Criteria Decision Making (FMCDM), Decision Making Trial and Evaluation Laboratory (DEMATEL) approaches have combined for project risk evaluation. Earlier in the study fuzzy TOPSIS and fuzzy DEMATEL approach were used for evaluating risk factors which are based on global software development project outcome (Heitkotter et al., 2013). In the recent study hybrid based technique such as TODIM and fuzzy DEMATEL were used for the evaluation of risks in supply chain projects (Mahmoodi et al., 2014). TODIM technique is never been integrated with FMCDM and DEMATEL to address the problem of bounded reality in software project risk evaluation. In this chapter, the proposed multi-technique approach “DEMATEL-FMCDM-TODIM "gives focus on providing an assessment scheme which can be used to classify risk on the basis of software project performances. The variables used for fuzzy linguistic are computed on the scale of [0, 1] by using the technique triangular fuzzy numbers. By using this approach, risk can be controlled at an early stage in any project which will be helpful to improve the performance of the software.

**STUDY**

**Fuzzy DEMATEL Method**

Having an accurate value in a complex system is very difficult during the preceding of decision making. The main objective of using this method is to evaluate the interrelationship among numerous criteria, multiple attributes, handling uncertainty and having subjective ambiguity with the decision-making process.

DEMATEL approach had achieved success in various contexts namely in the cases of knowledge management strategies, global managers competencies,
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