

PROJECT TIME, COST AND QUALITY CONSTRAINTS MANAGEMENT THROUGH STRUCTURED FUZZY MAPPING ON PSYCHOLOGICAL PHENOMENA

Yiyi MO¹, Chen WANG¹, Yutong TANG^{1*},
Jeffrey Boon Hui YAP², Lincoln C. WOOD³, Zhi Wee GUAZ⁴

¹*Intelligence and Automation in Construction Fujian Province Higher-educational Engineering Research Centre,
College of Civil Engineering, Huaqiao University, 361021 Xiamen, China*

²*Department of Surveying, Lee Kong Chian Faculty of Engineering and Science, Universiti Tunku Abdul Rahman
(UTAR), 43000 Kajang, Selangor, Malaysia*

³*Department of Business and Management, University of Otago, New Zealand*

⁴*Faculty of Built Environment, University of Malaya, 50603 Kuala Lumpur, Malaysia*

Received 4 July 2021; accepted 1 March 2023

Abstract. Construction business involves people from different employers who have to work together in one project, thus a project manager needs to apply scientific principles to understand and to utilize those common psychological phenomena such as Hedgehog Effect, Butterfly Effect, Pygmalion Effect, Boiled Frog Syndrome, Parkinson's Law, and Bandwagon Effect in completing work well and keeping people satisfied. The aim of this study is to develop a fuzzy mapping to assist project managers in implementing significant psychological phenomena in construction management through reflections on common psychological phenomena in the construction management. Through a structured interview survey among construction managers, the inferential association among gender, working experience, and the six psychological phenomena were plotted based on the Partial Least Square Structural Equation Modelling. Through the pairwise comparison technique, a fuzzy mapping of psychological phenomena in time, cost, and quality management was developed to facilitate the managerial efficiency in construction.

Keywords: psychological phenomena, behavior simulation, decision making, Fuzzy Logic, project triple constraints.

Introduction

Construction business involves people from different organizations, with often very different personality and backgrounds, that come together to achieve a common objective. The project-based nature and complexity of construction industry have made it as one of the most challenging environments for project manager to work with (Loosemore et al., 2003). Thus, there is a need to apply scientific principles to utilize common psychological phenomena to help complete work and keeping people satisfied (Doh et al., 2017; Kun, 2020). As suggested by Milajerdi et al. (2019) and Lee (1999), an effective training for managers should include awareness of common psychological phenomena that are seen in project management, including: Hedgehog Effect, Butterfly Effect, Pygmalion Effect, Boiled Frog Syndrome, Parkinson's Law, and Bandwagon Effect. However, there is still some con-

fusion and lack of knowledge in understanding how these psychological phenomena impact the personnel within construction industry and whether they can be used to facilitate the managerial efficiency in construction in terms of time, cost, and quality management. Therefore, more research is needed on how such psychological effects play a role in construction management. It is important and useful for managers to be able to predict the behaviors of team members (Bitterl & Schreier, 2018; Wang et al., 2016) as it is a range of staff that could either block or facilitate the progress towards specified project goals (Rao et al., 2019; Agarwal et al., 2021). Management psychology is about how to effectively manage an organization while taking into account the psychological impact on the organization and all stakeholders (Xia et al., 2022). By applying managerial psychology in management processes,

*Corresponding author. E-mail: 20013086035@stu.hqu.edu.cn