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Shared Mental Models, Team Adaptability, and Agile Project Success:
Evidence From Software Development Projects in Vietnam

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ABSTRACT

Agile methodologies are widely adopted in software development projects; however, their effectiveness varies across contexts. Prior research has focused primarily on procedural routines, providing limited insight into the cognitive and behavioral mechanisms through which Agile practices enhance performance, particularly within emerging economies. This study investigates the mediating roles of perceived shared mental models and team adaptability in the relationship between Agile practices and team performance. Survey data were collected from 252 software professionals in Vietnam and analyzed using mediation analysis (PROCESS Model 4) with bootstrap resampling and robust standard errors. The findings indicate that Agile practices enhance team performance both directly and indirectly through perceived shared mental models and adaptability. By proposing a dual-pathway model of Agile effectiveness, this study advances Agile and project management research while offering practical implications for strengthening Agile adoption through shared cognition and adaptive capabilities.

KEYWORDS

Shared Mental Models, Adaptability, Agile Practices, Team Performance

INTRODUCTION

In today's dynamic technological environment, software development teams face constant pressure to deliver high-quality products rapidly while adapting to changing requirements. Traditional linear models, such as the Waterfall approach, are often inadequate in volatile environments because of their limited flexibility and responsiveness to change. This structural rigidity constrains necessary adaptation (Mitchell & Seaman, 2009). In contrast, Agile development models are specifically designed to operate in volatile contexts by emphasizing continuous customer involvement, close team collaboration, and iterative delivery, thereby improving responsiveness to uncertainty and complexity (Cockburn & Highsmith, 2001).

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Despite its widespread adoption, agile implementation does not automatically guarantee superior outcomes. Many organizations continue to experience inefficiencies, misalignment, and inconsistent project performance, suggesting underlying systemic challenges in translating strategic intent into predictable execution (Lindsjørn et al., 2016). This inconsistency indicates that Agile success depends on more than procedural compliance. Rather, team-level factors, including cognition, coordination, and adaptability, determine whether Agile practices translate into meaningful performance gains.

Existing research on Agile effectiveness has primarily focused on structural and process-oriented aspects, including iteration length, backlog management, and customer involvement. Although these studies identify important operational strengths, they often overlook the cognitive and behavioral mechanisms underlying team effectiveness. Scholars increasingly acknowledge that team-level emergent states, such as shared mental models (SMMs), psychological safety, and adaptability, are critical to Agile success (Burke et al., 2006; Mohammed et al., 2010). However, these mediating factors remain underexplored in quantitative research, particularly within software development environments.

This gap is especially evident in emerging economies such as Vietnam, where Agile adoption is increasing but remains uneven in quality. To address this limitation, the present study empirically tests a dual-pathway model in which Agile practices influence team performance both directly and indirectly through SMMs (cognitive alignment) and adaptability (behavioral flexibility). By integrating insights from team cognition and adaptive performance literature into the Agile context, this study advances theory, extends empirical evidence to a new cultural setting, and provides practical guidance for improving Agile team effectiveness.

This study makes three key contributions to the literature on Agile and team effectiveness. First, it advances Agile theory by moving beyond process adoption to examine team members' perceptions of cognitive and behavioral mechanisms within Agile teams. By conceptualizing perceived SMM and adaptability as mediating mechanisms, the study explains how Agile practices influence perceived team performance through cognitive alignment and behavioral flexibility. Second, the study provides quantitative empirical evidence using a dual-pathway mediation model that simultaneously captures perceived cognitive alignment and behavioral adaptability among software professionals. This approach addresses the limited application of theory-driven mediation analysis in prior Agile research. Third, the study extends existing evidence to Vietnam, an emerging economy where Agile adoption is increasing but uneven, thereby improving the contextual relevance of Agile research in emerging IT environments.

This paper is organized into five sections. Section 2 reviews the theoretical foundations and relevant literature, leading to hypothesis development. Section 3 outlines the research methodology, including data collection, measurement instruments, and analytical procedures. Section 4 presents the empirical findings, including descriptive statistics, reliability analysis, factor analysis, and mediation testing. Section 5 discusses the findings in relation to prior research, highlights theoretical and practical implications, acknowledges study limitations, and concludes by summarizing the study's contributions and proposing directions for future research.

THEORETICAL FOUNDATION, LITERATURE REVIEW, AND HYPOTHESIS DEVELOPMENT

SMMs have been conceptualized as the extent to which team members possess aligned knowledge structures regarding tasks, roles, and processes (Cannon-Bowers et al., 1993). Methodologically, capturing SMMs is inherently complex because it involves identifying tacit cognitive representations that are not directly observable. Prior research has generally distinguished between two stages: eliciting individual mental representations and applying metrics to assess the degree of sharedness among team members (Cooke, 2000).

Various elicitation techniques have been used, including observation, structured interviews, surveys, process tracing, and conceptual mapping methods such as card sorting and Pathfinder