Chapter 73
The Role of Functional Diversity, Collective Team Identification, and Task Cohesion in Influencing Innovation Speed: Evidence From Software Development Teams

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ABSTRACT

This article opens up the black box of innovation and examines the relationship between functional diversity in software teams and the often neglected dimension of innovation – speed, over the two phases of innovation: creativity and idea implementation. By combining information processing view and social identity theory, the authors hypothesize that when collective team identification is low, functional diversity positively affects the time spent in the creativity phase; however, when collective team identification is high, this relationship is inverted U-shaped. When task cohesion is high, functional diversity negatively affects the time spent in the idea implementation phase; however, when task cohesion is low, this relationship is U-shaped. Results from 96 IT software-teams confirmed the authors' hypotheses. Theoretical and managerial implications are discussed.

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INTRODUCTION

Innovation has always been the "lifeblood" of IT software development teams to adapt to evolving market and technical conditions (Favaro, 2010; Kautz & Nielsen, 2004). To enlarge the pool of knowledge and better satisfy business needs, non-IT specialists such as strategy, marketing and graphic design professionals are increasingly involved in IT software development projects, causing a growing functional diversity of software teams (Gorla & Lam, 2004; Levina, 2005). Evidence shows that functional diversity – the distribution of differences among team members with respect to functional background – improves the quantity and quality of team innovation (Akgün, Dayan, & Benedetto, 2008; Harrison & Klein, 2007; Huelsheger, Anderson, & Salgado, 2009). As Nielsen company commented, cross-functional teams "generated concepts with greater appeal than those with less functional diversity" (Black, 2016). However, we know little about how functional diversity influences another dimension of innovation – the speed of innovation in software teams.

Indeed, speed has become an important measure of success for IT software teams (Lee & Xia, 2010). As BusinessWeek-BCG survey found, "the No. 1 obstacle (to innovation that executives face today) is slow development times" (Bloomberg Businessweek, 2006). Many industrial tutorials suggested that the refinement of cross-functional teams is "a well-researched proven practice to speed and improve development" (e.g., Larman & Vodde, 2009, p. 151). Despite the increasing attention to speed of innovation, the extant literature mostly focused on the effect of functional diversity on quality or quantity of innovation. The few studies on the relationship between functional diversity and speed of innovation have, nonetheless, produced inconclusive results (Lee & Xia, 2010). Acknowledging this important research gap, our study aims to investigate the relationship between functional diversity and speed of innovation in IT software teams from a more nuanced perspective. Different from most previous research that assessed the overall speed of innovation (e.g., Eisenhardt & Tabrizi, 1995; Lee & Xia, 2010), we fruitfully distinguish two different phases of innovation: creativity phase (i.e., generation of creative ideas) and idea implementation phase (i.e., successful implementation of creative ideas) (Somech & Drach-Zahavy, 2013). As the two phases have distinct goals, characteristics and tasks (Amabile, 1988; West & Farr, 1990), functional diversity may bring different combinations of benefits and costs to a team in each phase, and affects the speed of each phase in distinct ways (Bledow et al., 2009). Thus, our research question is: How does functional diversity in a team affect the team's speed in the two phases of innovation respectively, i.e., creativity phase and idea implementation phase?

In particular, this study draws on the information processing view (Galbraith, 1974; Tushman & Nadler, 1978) and the social identity theory (Tajfel, 1981) to guide hypotheses development. The information processing view sheds light on speed of innovation by offering a cognitive lens explaining how teams gather, interpret, and integrate diverse information from members with different multiple functional backgrounds to fulfill tasks in each innovation phase (Galbraith, 1974; Paulus, 2000). However, this view implicitly assumes that all teams are equal in their members' willingness to utilize diverse inputs from each other and overcome potential conflicts among them for the benefits of the team. As social identity theory suggests, this is often not the case; rather, it is team identification (i.e., members' shared sense of identification with a team) that shapes the willingness of members to engage in team tasks (Ke & Zhang, 2010; Tajfel & Turner, 1986; Van Der Vegt & Bunderson, 2005). Team identification is especially critical for functionally diverse teams as it reflects the motivational climate for members to overcome their focus on self-interested perspectives, capitalize other's diverse expertise, and cooperate