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New product development in turbulent environments: Impact of improvisation and unlearning on new product performance

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Abstract

Team learning is vital for organizations in order to compete in fast-paced environments. However, the ways learning can be effective in such environments warrents research, especially for teams developing new products under rapidly changing technological and market conditions. Interestingly, recent new product development (NPD) literature demonstrates the essential role of improvisation (i.e., planning and executing any action simultaneously) and unlearning (i.e., changes in team beliefs and project routines) for effective learning and performing under turbulent conditions. However, the combined effect of team improvisation and unlearning on new product success (NPS) has largely been ignored. This paper investigates the nomological relations among team improvisation and unlearning, new product success, and environmental turbulence, and contributes to the literature on NPD team learning, and on team flexibility under turbulent conditions. By examining 197 new product-development projects, we found that (1) environmental turbulence positively affects team unlearning, (2) team unlearning concurrently stimulates team improvisation, (3) team improvisation positively impacts new product success by utilizing/implementing new knowledge acquired by unlearning and improvisation. We further discuss the theoretical and managerial implications of our conclusions.

JEL classification : M10; D83

Keywords: Learning; Improvisation; Unlearning; Turbulence; New product development

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1. Introduction

Starting in the early 1980s, a growing the emphasis was on the role of new product development (NPD) as a potential source of competitive advantage in the technology and innovation management literature (Cooper, 1984; Takeuchi and Nonaka, 1986; Booz et al., 1982; Maidique and Zirger, 1985). For instance, Brown and Eisenhardt (1995, p. 344) noted that product development is seen as ''among the essential processes for success, survival, and renewal of organizations, particularly for firms in either fast-paced or competitive markets.'' However, NPD has potential risks and many challenges (Cooper, 2003). A key challenge faced by NPD projects is how to cope with environmental turbulence in order to reduce the risk of failure of either the project or the resulting product (Calantone et al., 2003; Cooper, 2003). In this regard, technology and innovation management literature highlights the essential role of unlearning and improvisation to cope with the environmental changes and turbulence experienced during NPD activities (Akgün et al., 2006; Moorman and Miner, 1998a; Imai et al., 1988; Kamoche and Cunha, 2001; Li and Atuahene-Gima, 2001). Especially, scholars pointed out that team improvisation, operationalized as planning and acting simultaneously (Moorman and Miner, 1998a), and unlearning, operationalized as changes in beliefs and routines (Sinkula, 2002; Akgün et al., 2006), fosters flexible and impulsive responses to rapidly changing markets and technologies.

For instance, Eisenhardt and Tabrizi (1995) indicated that teams using an improvisation strategy could accelerate product development in highly turbulent industries, such as computers. Similarly, Moorman and Miner (1998a) empirically found that improvisation is important for NPD processes under turbulent conditions. Whereas Iansiti (1995) and Akgün et al. (2006) noted that team unlearning helps teams to accommodate new knowledge about evolving customer needs and technologies and facilitate an effective NPD process that can tolerate the rapid changes in technology and markets. However, it is interesting to note that the researchers investigated team improvisation and unlearning separately, omitting their interrelations in a NPD project team context as a research question. This may be explained by recent insights of the organizational and team-learning literature, which assert that improvisation and unlearning are, in essence, different avenues of the team-learning process and are covariates to each other (Akgün et al., 2003; Moorman and Miner, 1998b). In fact, the *NPD process and team flexibility in turbulent environments* predominantly lies in the discussions of team improvisation and unlearning, because:

- Fixed routines and beliefs stand in the way of impromptu behavior, because they create a path dependence for the learning process in general (Fowler et al., 2000) and for improvisation in particular (Moorman and Miner, 1998b). For instance, researchers indicate that beliefs and routines can be entrenched by positive feedback (Leonard-Barton, 1995; Methé et al., 1997; Kash and Rycroft, 2002). If positive feedback takes place rapidly, consistently, and broadly enough, a ''lock-in'' (behavior/reward) may take place (Mezias et al., 2001; Kash and Rycroft, 2002). The first beliefs and routines then tend to be repeated and may be the only ones ever developed.

  In this regard, a path-dependence, result of the fixed routines and beliefs, constrains the search for new learning opportunities and restricts a team's functioning and acting. Especially when a team plans and executes an action simultaneously, i.e., team improvisation, the belief structures of the team members and the project routines need to be synchronized with that action for effective team functioning and problem solving, because (a) a team's beliefs, operating outside of normal conscious behavior—acting like a conditioned reflex, lead to perception rigidity, and thereby hinder the enactment of action as it unfolds, and (b) project