



Exploitative learning in project teams: Do cognitive capability and strategic orientations act as moderator variables?

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Abstract

This research aims to advance our understanding of the relationship between exploitative learning and new product development (NPD) efficiency by investigating four novel contextual variables. Based on a survey of 193 NPD projects in information technology firms located in Taiwan, we used hierarchical moderated regression analysis to test our research hypotheses. The results reveal that the relationship between exploitation and NPD efficiency is positively moderated by managerial strategic consensus and the cognitive capabilities of team members. Our findings suggest that NPD project teams engaging in exploitation yield improved NPD efficiency when the cognitive capabilities of team members and strategic consensus between managers are present. If firms desire to leverage exploitation to succeed in the highly volatile IT industry, they must recognize and create conditions under which exploitation will bring about desirable outcomes.

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1. Introduction

In current hypercompetitive business environments, new product development (NPD) has become a fundamental topic. To develop new products, companies typically organize multiple project teams to engage in two types of learning activities: exploration and exploitation (Atuahene-Gima and Murray, 2007; Gupta et al., 2006). Exploitation involves the improvements in existing knowledge, technology, and paradigm; exploration, on the other hand, involves the search for new knowledge and technology and experimentation with new alternatives (March, 1991). In practice, the faster that companies can develop new products, the greater the likelihood that they can gain pioneering advantages (Kessler and Chakrabarti, 1999; Langerak and Hultink, 2008). Thus, time-based competition that aims to

compress the time required for NPD is a vital strategic concern in industries characterized by rapidly changing technologies and customer demands, such as high-tech industries (Chen et al., 2005). Reducing development cycle time is advantageous because it leads to quick market feedback, reduced costs, and ultimately, business success (Chen et al., 2005; Yang, 2012).

Moreover, the speed at which a project team develops a new product mirrors its NPD efficiency, which is substantially influenced by exploitation (Levinthal and March, 1993; Özsomer and Gençtürk, 2003). Nevertheless, Yannopoulos et al. (2012) indicated that conducting exploitative learning does not ensure superior NPD performance unless certain contextual conditions are met. As scholars have highlighted, effective team learning hinges on whether a project team is systemically managed to perform and accomplish its goals (Akgün et al., 2006; Yannopoulos et al., 2012). In this sense, the strategic and human aspects of NPD that are closely related to team management appear to be critical contextual factors (Bourgeon, 2007; DeShon et al., 2004). Given that these contextual factors

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may determine the extent to which NPD teams can benefit from exploitation, we aimed to identify these factors as moderators for the relationship between exploitation and NPD efficiency.

Researchers have ascribed the success of NPD projects to the effective implementation of the strategic aspects of NPD, such as project strategies and strategic orientations (Arto et al., 2007; Yang, 2012). Based on the behavioral perspective (e.g., Day, 1994; Jeong et al., 2006), the organizational conditions under which NPD projects are implemented are defined by a company's strategic orientations, which guide the allocation and use of resources. Atuahene-Gima et al. (2005) particularly indicated that the effective use of resources depends on two strategic orientations: the degree of rigidity or flexibility of strategic missions (i.e., strategic mission rigidity) and the consensus among managers regarding product strategies and objectives (i.e., strategic consensus). Li and Lin (2008) substantiated that these two strategic orientations moderate the associations between market orientations and product innovations. That strategic orientations influence how NPD project teams perform exploitative learning is plausible. Hence, we incorporated strategic mission rigidity and strategic consensus as moderators to explain how exploitation leads to NPD efficiency.

The composition of team members and the characteristics of team leaders also play a pivotal role in team learning (García-Morales et al., 2012). Team leaders directs how an NPD team applies newly acquired knowledge to NPD efforts (Sarin and McDermott, 2003). At the same time, NPD teams are highly likely to be successful when team members possess right skills (Barczak and Wilemon, 2003). These skills typically include functional expertise (Henke et al., 1993; Katzenbach and Smith, 1993) and interpersonal and team-building skills (Barczak and Wilemon, 2003; Henke et al., 1993). Based on the socio-cognitive view, Akgün et al. (2006) argued that a project team must function as an integrated unit when engaging in learning. Due to the interactive characteristic of the learning process, cognitive capabilities for integrating disparate views and knowledge bases are essential for team learning (Akgün et al., 2006; Park et al., 2009); this capability is manifested through individual cognitive skills (DeShon et al., 2004). Madhavan and Grover (1998) proposed two types of cognitive skill: the T-shaped skills of team members and the A-shaped skills of a team leader.

T-shaped skills refer to the capabilities of individual specialists to maintain meaningful and synergistic conversations with others. The “T” connotes the dimensions of depth (the vertical part of “T”) and breadth (the horizontal part of “T”). People with T-shaped skills not only possess in-depth knowledge of a discipline, but also understand how their branch of knowledge interacts with other branches to function as a whole (e.g., knowledge on ceramic materials engineering and how it is related to polymer processing). Distinct from T-shaped skills, which involve professional skills, A-shaped skills involve professional and interpersonal skills. A-shaped skills refer to the unique ability of team leaders to synergistically integrate insights from multiple sources of knowledge (Madhavan and Grover, 1998). Both types of skill are crucial

for a project team to perform exploitation activities because such skills enable the knowledge possessed by individuals in a team to become collective knowledge (Akgün et al., 2006; Madhavan and Grover, 1998). We therefore posited that A-shaped and T-shaped skills act as key moderators.

In summary, this study focused on the exploitative activities of project teams by modeling strategic orientations and cognitive capability as contextual moderators in the relationship between exploitation and NPD efficiency (Fig. 1). The hypotheses are subsequently elucidated and are followed by the results of hypotheses testing based on 193 project teams in IT firms. This paper concludes with a presentation of theoretical and managerial implications.

2. Theoretical foundation and research hypotheses

Organizational learning theory provides the theoretical basis for the association between exploitation and NPD performance. Organizational learning is defined as the development of knowledge or insights that facilitate behavioral change (Hurley and Hult, 1998). Because knowledge has been considered a distinctively unique resource (Grant, 1996; Kogut and Zander, 1992), organizational learning can be a means of generating capabilities that are valued by customers and difficult to imitate (i.e., capabilities that generate a competitive advantage). Therefore, organizational learning has great potential for influencing organizational outcomes (Levinthal and March, 1993) and is the main determinant of performance differences among companies (Crossan and Berdrow, 2003).

Extending the research on cognitive aspects of organizational learning, Argyris and Schön (1978) and Argyris (1982) distinguished between single-loop learning and double-loop learning. Single-loop learning involves cognitive and behavioral changes within an existing framework whereas double-loop learning involves the transformative changes of underlying assumptions (Argyris, 1999). The former is similar to exploitation (Auh and Menguc, 2005), which refers to the refinement and extension of existing competencies and resources (March, 1991). The core theme of exploitation is to maintain a comparatively stable domain by committing sufficient organizational resources and ensuring the current viability of a company against its rivals (Auh and Menguc, 2005; Levinthal and March, 1993). Specifically, exploitation mainly concerns finding methods for refining and modifying existing organizational routines, skills, and capabilities so that operational efficiency can be attained by engaging in similar routines and activities (Levinthal and March, 1993). Exploitation includes, but is not limited to, activities such as refinement, production, efficiency, selection, implementation, and execution (March, 1991).

In practice, exploitation is typically conducted by project teams in a firm (Eriksson, 2013; Gupta et al., 2006). To evaluate the performances of NPD projects, researchers suggest two dimensions of performances, effectiveness and efficiency (Griffin and Page, 1996; Olson et al., 1995). “Effectiveness” comprises the economic success and the product's technical quality whereas “efficiency” involves the timeliness and amount of resources required during the project. Because the returns from exploitation

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