

Capabilities Driving Competitive Advantage in New Product Development: Coordination Capability, Absorptive Capability, and Information Technology Capability

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Abstract. Coordinating demand-side and supply-side partners' resources is critical for creating competitive advantage in new product development (NPD). Recently, the interorganizational coordination efforts have been further augmented through complementary investments in product lifecycle management (PLM). PLM provides an integrated collaborative product development platform that enables firms to effectively conduct complex and communication-intensive interorganizational coordination. The capabilities of coordinating demand-side and supply-side partners and of employing PLM system in interorganizational coordination are likely to be critical in determining firms' competitive NPD advantage. Hence, the first purpose of this study is not only to understand what the impact of coordination capability with demand-side and supply-side partners will be on competitive NPD advantage, but also to investigate how IT capability derived from implementing PLM systems shapes the role of coordination capability in creating competitive NPD advantage. Moreover, successful NPD requires firms to have highly developed absorptive capability allowing them to internalize and translate partners' knowledge into product development. Somewhat overlooked has been the moderating effect of absorptive capability on the competitive impact of coordination capability. Hence, this study's second purpose is to understand how absorptive capability shapes the role of coordination capability in creating competitive advantage in NPD.

Keywords: Coordination capability · Competitive advantage in new product development · Product lifecycle management system · Information technology capability · Absorptive capability

1 Introduction

Competitive advantage in new product development (NPD) refers to firms' ability to develop new products that outperform their competitors in the marketplace [12, 19, 23]. NPD involves various complex and interdependent activities, such as generating and

assessing various new product opportunities and ideas, translating product requirements into final design specifications, and launching product to market [8, 13]. Creating competitive advantage in NPD requires firms to effectively collaborate with demand-side and supply-side partners. Collaboration involves intense interorganizational processes that use coordination mechanisms to develop mutual understanding between firms and their partners and to align the partners' activities with the firms' objectives [1, 12, 24].

In the NPD context, researchers and practitioners have underscored the importance of coordination capability and information technology (IT) capability to the success of integrating demand-side and supplier-side partners' resources [8, 10, 14]. When NPD takes place in supply chain context, the relationships between firms and the firms' demand-side or supply-side partners have to be restructured to go beyond operational efficiencies in order to create an environment that enables the firms to leverage their partners' resources to develop new product [2, 3]. This has in turn created demand for appropriate interorganizational coordination mechanism to support the complex interaction processes and to ensure information integration with demand-side and supply-side partners. Coordination capability enables firms to tap into the pool of external information, expertise and experiences held by demand-side and supply-side partners help improve NPD performance. The greater coordination with demand and supply-side partners results in the increased formation processing requirements, leading to the heavy emphasis on firms' IT capability [3, 20, 25].

Numerous studies have investigated how IT capability and interorganizational capability contributes to NPD performance (e.g., [8, 12, 13, 18, 23]). However, most of prior research investigating coordination capability and IT capability has conceived of them as operating independently with regard to their effect on NPD performance [3]. Less attention has been paid to how coordination capability with demand-side and supply-side partners will be synergistically complemented by IT capability in their impact on the creation of competitive advantage in NPD. There is growing doubt that isolated organizational capabilities, however valuable, may not be effective as a single asset, especially for complex interorganizational activities such as partner-oriented NPD. Researcher has found that the value of organizational capabilities emerges from complementarities [6, 7, 9]. When both IT and coordination capabilities are held, NPD can benefit from their complementarity. IT capability is regarded as an effective complement to coordination processes. Whereas firms may have developed strong coordination capability with external partners, unless complemented by the adequate IT capability, the firms are unlikely to yield the desired effects on competitive advantage in NPD. Accordingly, this study first addresses the following question: *What will the impact of coordination capability with demand-side and supply-side partners be on competitive advantage in NPD? How does IT capability shape the role of coordination capability in creating competitive advantage in NPD?*

Moreover, another contribution of this study is the emphasis on absorptive capability as a moderator in the relationship between coordination capability and competitive advantage in NPD. Absorptive capability refers to firms' ability to identify, assimilate and exploit valuable knowledge received from external sources, such as demand-side and supply-side partners [5, 22]. This study will address the issue of how the effects of firms' coordination capability on competitive advantage in NPD can be

moderated by the firms' absorptive capability. Answering this question can make a contribution to the literature on the NPD performance impact. Furthermore, whether firms are able to internalize and translate transferred knowledge into their NPD process may crucially depend on their absorptive capability [11, 15]. Therefore, this study expects that the impact level of firms' coordination capability on competitive advantage in NPD will be moderated by the firms' absorptive capability. With this motivation, the second research question that this study will seek to address is: *How does absorptive capability shape the role of coordination capability in creating competitive advantage in NPD?*

2 Conceptual Background and Research Model

NPD involves various complex and interdependent activities that can be decomposed into discovery, development, and commercialization [8, 13]. Each of the NPD activities has different requirements, including market, design and manufacturing technology information collection and analysis as well as coordination with related NPD participants [3, 23, 24]. NPD success is driven by how demand-side and supply-side partners' resources are integrated and deployed in the NPD process [12, 19, 21]. Integrating partners involves intense interorganizational processes requiring firms to coordinate the partners' activities to ensure interoperability and seamless process synchronization [6, 16, 17]. Firms have to establish appropriate coordination mechanisms for facilitating mutual understanding with NPD partners and aligning the partners' activities with their objectives.

Moreover, successful NPD requires firms to harness new knowledge obtained from external sources (e.g., demand-side and supply-side partners) and to apply the new knowledge to understand market tendencies and to catch market opportunities [2, 4, 22]. Highly developed absorptive capability allows firms not only to find out about technological developments or business trends, but also to integrate external knowledge into their NPD activities [5, 11, 15]. Hence, this study suggests that creating competitive advantage in NPD requires three key organizational capabilities: coordination capability with demand-side partners, coordination capability with supply-side partners, and absorptive capability.

To address the research issues, this study draws on the resource-based view (RBV) to propose a competitive advantage impact model (Fig. 1) of complementary NPD drivers, encompassing coordination capability, absorptive capability, and IT capability. For establishing the impact model, this study will employ an integrated perspective from interorganizational coordination, IT-based business value and organizational learning to investigate how coordination capability with demand-side and supply-side partners influences competitive advantage in NPD and how IT capability and absorptive capability moderates the impact of coordination capability.

When considering interorganizational coordination capability required in the NPD context, the research model focuses on coordination capability with demand-side and supply-side partners. Moreover, absorptive capability and IT capability derived from Web-enabled interorganizational systems are regarded not only as the important factors in creating competitive advantage in NPD but also as the complements to moderate the

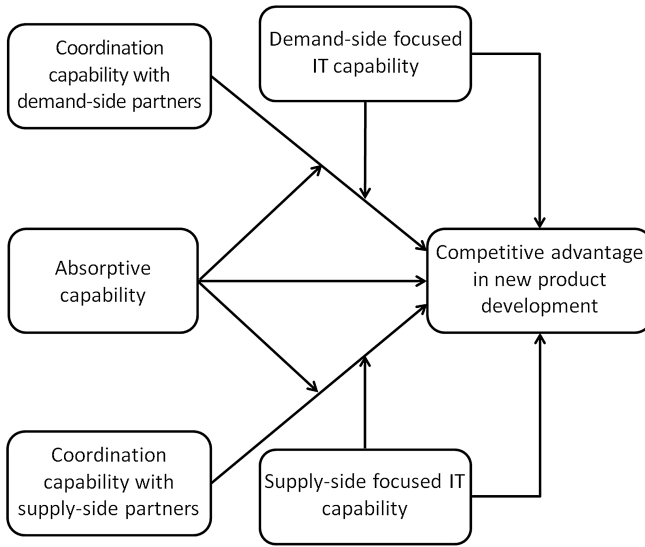


Fig. 1. Research model

effects of coordination capability with demand-side and supply-side. Specifically, the model evaluates (1) the impact of coordination capability with demand-side and supply-side partners on competitive NPD advantage, (2) the impact of IT capability derived from Web-enabled interorganizational systems on competitive NPD advantage, (3) the moderating effect of IT capability derived from Web-enabled interorganizational systems on the impact of coordination capability with demand-side and supply-side partners, (4) the impact of absorptive capability on competitive advantage in NPD, and (5) the moderating effect of absorptive capability on the impact of coordination capability with demand-side and supply-side partners.

3 Anticipated Contributions

This study focuses on investigating what the impact of coordination capability with demand-side and supply-side partners will be on competitive advantage in NPD and how absorptive capability and IT capability of Web-enabled interorganizational systems moderates the impact of coordination capability. For addressing the research issues, this study draws on the RBV to propose a competitive advantage impact model of complementary NPD drivers. Based on the literature analysis and a comprehensive study in the impact of coordination capability on competitive advantage in NPD and the moderating effect of IT capability and absorptive capability, this study will provide several contributions.

First, this study will investigate the ways through which coordination capability with demand-side and supply-side partners affect competitive advantage in NPD. The results will help answer the question of what the impact of coordination capability with

demand-side and supply-side partners will be on competitive advantage in NPD (i.e., the first part of the first research question of this study). Second, this study will investigate how IT capability derived from Web-enable interorganizational systems moderates the impact of coordination capability on competitive advantage in NPD. The results will help answer the question of how IT capability shapes the role of coordination capability in creating competitive advantage in NPD (i.e., the second part of the first research question of this study). Third, this study will investigate how absorptive capability moderates the impact of coordination capability on competitive advantage in NPD. The results will help answer the question of how absorptive capability shapes the role of coordination capability in creating competitive advantage in NPD (i.e., the second research question of this study).

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