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Team vision in product development: How knowledge strategy matters

Elena Revilla ^{a,*}, Beatriz Rodríguez ^b^a Operations and Technology Management Department, IE Business School, María de Molina, 12, 5 Planta, 28006 Madrid, Spain^b Applied Economy Department, Avd. Valle Esgueva 6, Universidad de Valladolid, 47011 Valladolid, Spain

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ABSTRACT

In today's more complex multinational and technologically sophisticated environment, the group has re-emerged in importance as the project team. Work teams are important to organizations in general, but are especially critical in product development because they span many functional areas including engineering, marketing, manufacturing, finance, etc., and new product teams must frequently be composed of individuals from different backgrounds and perspectives. In these circumstances, this paper addresses the contingency role that knowledge strategy plays in explaining the relationship between team vision and product development performance. After studying the team vision on 78 new product developments from a wide variety of firms, we found that effective team vision varies depending on the knowledge strategy—defined in terms of punctuated equilibrium in the explorative cycle, low ambidexterity and high ambidexterity. Our results demonstrate that while trade-off is positively associated with success in all strategies, clarity is only associated with low ambidexterity strategies and strategy-fit is only associated with high ambidexterity strategies.

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1. Introduction

Organizations have become increasingly dependent on cross-functional teams to carry out their R&D tasks and innovate. Recent empirical research shows that most firms have implemented cross-functional teams for the majority of new product development projects undertaken (Hong et al., 2005). Product development is becoming multidisciplinary and technologically complex and occurs at intersections of different fields. Additionally, research substantiates links between effectiveness and collectivist notions such as cohesion, coordination or cooperation (Teasley et al., 2009). Furthermore, the effectiveness of product development is contingent upon the integration of different specialized capabilities, strong functional groups, large numbers of people and multiple pressures (Perry-smith and Vincent, 2008; Nellore and Balachandra, 2001). Clark and Wheelwright (1993) and Coopers (1999), among many other researchers, also suggest that the success of product development is determined by the integration of abilities of both upstream (e.g. research and development, marketing and design engineering) and downstream activities (e.g. manufacturing engineering, operations and quality control). However, despite the virtues of cross-functional teams, which have been widely extolled, and the increasing attention being devoted to understanding their integration process, different

perspectives and backgrounds may lead to conflict and result in negative outcomes (Keller, 2001).

In light of the conflicting literature, there is still a relative dearth of studies investigating team-level factors influencing such integration among all of the functions involved in product development and their effects on performance (Hoegl and Parboteeah, 2007). Literature in the area of innovation has suggested that performance can be affected by two sets of factors—the characteristics of the team and the contextual influence of the team (Sethy, 2000; Lynn and Akgün, 2001). Accordingly, this paper considers variables related to these two sets of factors. Regarding team characteristics, it focuses on team vision because this concept is considered important to minimize the effects of the functional diversity in the group and to promote better performance. In this paper, team vision refers to the existence of a common background, a clear set of goals, priorities, trade-offs and a good understanding of the overall goals of the firm and of the project itself. As Brown and Eisenhardt (1995) state, although this aspect of the team is considered critical, our understanding of exactly what team vision is and its link with product development performance is very weak. Crawford and Di Benedetto (2000) also point out that there is surprisingly little research on vision at the product development level.

Although team vision may be able to influence product development performance, it may not be, in itself, sufficient to explain product development performance. The ability of team vision to produce better performance can be helped or harmed by contextual influences of the team (Olson et al., 1995; Lynn and Akgün, 2001). Team or group context reflects influences or contingences stemming from the team environment (Doolen et al., 2003). Abernathy and Clark (1985)

* Corresponding author. Tel.: +34 91 5689600; fax: +34 91 5610930.

E-mail addresses: elena.revilla@ie.edu (E. Revilla), brodriguez@eco.uva.es (B. Rodríguez).

suggested that the importance of innovation in competition depended on its capacity to influence the firm's existing resources, knowledge and skills. Danneels (2002) adopted the same basic principle and categorized product developments based on whether the required capabilities already existed in the firm, or were new. From this point of view, product development operates under different logic, so a firm should choose the one in which they develop the new product. Previous research has already pointed out the need to analyze variations on the degree of newness of knowledge in explaining key-organizational questions related to innovation (Freel and de Jong, 2009; Ellonen et al., 2009; Jayawarna and Holt, 2009; Gobbo and Olsson, 2010; Rhee et al., 2010). This paper draws on a knowledge strategy (Choi et al., 2008) to examine how knowledge exploration and exploitation actions moderate the relationship of team vision and product development effectiveness.

The conceptual distinction between exploration and exploitation (March, 1991) has emerged as an underlying theme in research on organizational learning and strategy (Levinthal and March, 1993; Bierley and Chakrabarti, 1996; Vera and Crossan, 2004), innovation (Rothaermel and Deeds, 2004) and organization theory (Holmqvist, 2003). Exploration is a manifestation of organizational learning that entails activities such as search, variation, experimentation, challenging existing ideas and research and development. It is thus about improving and renewing the organization's expertise and competences to compete in changing markets by introducing the variations needed to provide a sufficient amount of choice to solve problems (March, 1991). Exploitation is a different manifestation of organizational learning that involves efficiency, selection, implementation, control, refining and extending existing skills and capabilities. It reflects how the firm harvests and incorporates existing expertise and competences into its operations, not only to economize the efficiency of existing resource combinations (Levinthal and March, 1993) but also to create new ones.

According to these differences between exploration and exploitation, it is expected that team vision will have different effects on product development performance depending on the product development knowledge strategy—defined in terms of exploration and exploitation. Thus, focusing on team level analysis, the purpose of this article is to define team vision as a means to integrate different functional areas, discuss its components and to understand how the impact of team visioning on product development performance may vary depending on the knowledge strategy type. Studying the extent to which this team-related factor affects product development performance, this paper makes several contributions. From a practical point of view, this study focuses on understanding factors that explain product development success. Although this paper is somewhat exploratory in nature, it considers variables that can be influenced by managers; the findings of the study should provide useful recommendations for enhancing product development performance. In terms of theory, an important contribution of this study is the extension of the existing research on team vision, which so far has focused primarily on the organizational level, to a team level. Another major contribution of this study is its examination of how some apparently conflicting demands that are placed on product development teams affect performance. For example, this study supports that product development does not involve a trade-off between exploration and exploitation in such a way that one occurs at the expense of the other. On the contrary, product development efforts simultaneously develop both knowledge activities.

In order to do this, this paper, first, discusses the concept of team vision, followed by how a vision may be developed and helps the integration of the different groups and tasks, thus leading to success in product development. Next, it characterizes the product development knowledge strategy and associates it with team vision components. Then, we test the hypothesis on the basis of

data generated from a questionnaire survey accomplished in a sample of product developments. Such test can give a snapshot of where differences exist and how team vision can contribute to success in product development. A discussion of the implications, limitations and future research directions concludes our research paper.

2. Literature review and hypotheses

2.1. Team vision

The product development literature states that effective innovation in new products relies on inputs from different functions and that for innovation to cross the domain from the individual to the team domain; it needs the right mix of individuals from a variety of functional areas such as marketing, research and development, manufacturing and purchasing (Tang, 1998). The path to technology commercialization requires the combination of many different knowledge sets (Perry-smith and Vincent, 2008). Accordingly, the knowledge necessary for product development is usually codified and structured differently in the various functional areas (Carlile, 2002; Madhavan and Grover, 1998). One of the primary benefits of working in teams is that, as a unit, the team is more likely to have access to the necessary information and expertise to solve problems (Williams and O'Reilly, 1998).

While this type of team has great potential, it is simultaneously one of the most difficult types of team to manage successfully. Functional background differences are the key source of task conflict that can undermine group functioning. (Pelled et al., 1999; DeDreu and Weingart, 2003). While greater diversity in the functional background of team members is linked to a higher number of innovations the group proposes (Bantel and Jackson, 1989; Milliken and Martins, 1996), the cross-functional team has been noted as having difficulties in reconciling ideas and moving from wildly different perspectives towards consensus (Dougherty, 1992). Task conflict includes disagreements and debates regarding task content that revolve around what actions are necessary to complete the task. In this situation, process losses that jeopardize the final product development result may come about (Ancona and Caldwell, 1992).

In order to minimize the effects of functional diversity in the group and to promote better performance, it is important to develop a common view among team members (Imai et al., 1985; Hayes et al., 1988). Because individuals from various functional areas often have different ideas about the product to be developed, without effective team vision these individuals generally pull the project in different directions and thereby adversely affect the performance of the new product (Sethy, 2000).

Kotter (1995) describes vision in terms of something that helps clarify the direction in which to proceed. Similarly, Crawford and Di Benedetto (2000) describe vision in terms of team direction, goals and objectives. From the perspective of the new product teams, Brown and Eisenhardt (1995) define vision as the meshing of an organization's competence and strategies with the needs of the market to create an effective concept. In this same line, team vision is seen as a shared purpose and plan of action that clarifies mission, strategic fit and sets of project targets and priorities that are consistent with the firm's internal capabilities and the market place realities (Clark and Wheelwright, 1993).

The concept of vision becomes one of the tools or means to engender meaning to a project. Weick (2001) has discussed how systems of sense-making are vitally important when specialization and decentralization results in the segregation of people and the differentiation of processes in undertaking an activity. Because product development requires coordination and aligns all functions

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