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International Journal of Project Management 31 (2013) 333 – 341

International Journal of Project Management

www.elsevier.com/locate/ijproman

Exploration and exploitation in project-based organizations: Development and diffusion of knowledge at different organizational levels in construction companies

Per Erik Eriksson *

Department of Business Administration, Technology and Social Sciences, Luleå University of Technology, SE-97187, Luleå, Sweden

Received 20 March 2012; received in revised form 13 July 2012; accepted 19 July 2012

Abstract

Management studies highlight the importance of an organization's capability to both exploit existing knowledge and technologies for short-term profits and also explore new knowledge and technologies to enhance long-term innovation. Although this paradox recently has received escalating interest in management research, studies dealing with project-levels and project-based organizations (PBOs) are scarce. This conceptual paper discusses how PBOs in the construction industry can manage the exploration/exploitation paradox at different organizational levels. Short-term project focus and decentralization inhibits learning from one point in time and space to another, making it easier to reap the benefits of exploitation than of exploration. Current structural and sequential separation of exploration and exploitation activities at business unit, project portfolio, and project levels do not solve the paradox, due to lack of integrating mechanisms. Hence, PBOs in the construction industry may suffer from inadequate extent of exploration, while the extent of exploitation is not reaching its potential. Cooperative procurement procedures can serve as a basis for facilitating both exploration and exploitation of knowledge and technologies in construction projects.

Keywords: Ambidexterity; Exploration; Exploitation; Innovation; Procurement; Construction industry

1. Introduction

A frequently discussed theme in organizational research is the paradox of short-term focus on efficiency, based on exploitation of existing knowledge and technologies, and long-term focus on innovation and strategic development, based on exploration of new knowledge and technologies (Benner and Tushman, 2003; Raisch et al., 2009). Since both elements are critical for sustainable competitive advantage, firms need to explicitly manage both exploration and exploitation (Gupta et al., 2006; March, 1991). Earlier research has mostly studied the tension between exploration and exploitation on firm-level (Katila and Ahuja, 2002; O´Reilly and Tushman, 2011; Uotila et al., 2009) or strategic business unit (SBU) level (Gibson and Birkinshaw, 2004; Jansen et al., 2006), but it is relevant at other organizational levels as well (e.g. alliance, project, team, and individual). Koza and Lewin (1998) were first to address the exploration/exploitation paradox in an inter-organizational context when investigating strategic alliances. Although recent studies have contributed to this knowledge (Lavie and Rosenkopf, 2006; Lin et al., 2007; Tiwana, 2008), there is still limited understanding of how exploration and exploitation can be facilitated in inter-organizational relationships through different organization designs and contractual arrangements (Im and Rai, 2008).

A few studies have investigated exploration and exploitation at a project portfolio level (Andriopoulos and Lewis, 2009; Lavie and Rosenkopf, 2006; O´Reilly and Tushman, 2004), by differentiating between projects for radical innovation and projects for continuous improvements or implementation projects. However, Tiwana (2008) argues that pure project-level investigations, in which the paradox and its effects on

* Tel.: +46 920 493058.
E-mail address: pererik.eriksson@ltu.se.

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http://dx.doi.org/10.1016/j.ijproman.2012.07.005

performance are studied within projects, are very few. This gap may be due to that exploration/exploitation studies have focused mainly on various manufacturing industries (Adler et al., 1999; Katila and Ahuja, 2002) rather than project-based industries, such as the construction industry (Eriksson and Westerberg, 2011).

Companies whose work is predominantly or entirely performed in projects are commonly referred to as project-based organizations (PBOs) (Hobday, 2000). This paper discusses how PBOs in the construction industry can manage the exploration/exploitation paradox. The construction industry, which in many ways is the epitome of a project-based industry, is an interesting and relevant context in this matter due to its size and importance and the complex and often unique nature of the projects. The construction industry is one of the backbones of the economy in most countries (6-10% of GDP in most OECD countries) (Gann and Salter, 2000; Widén and Hansson, 2007). Furthermore, its products (e.g. buildings and infrastructures) and processes chiefly impact our modern society in terms of “quality of life”, and it is responsible for high energy-consumption, waste generation, and pollutions (Ortiz et al., 2009). An innovative and efficient construction industry is therefore of high societal relevance.

Although sometimes challenged, the conventional view is that the construction industry lacks innovation (Barlow, 2000; Widén and Hansson, 2007). However, the suggested improvement agenda fails to account for the specificities of innovating within the project-based context (Dubois and Gadde, 2002; Harty, 2008). In prior project management literature the need to break down barriers to innovation and the need to resolve conflicts between project actors are generally revealed as conclusions rather than starting points (Harty, 2008). In other words, previous research has focused on *what* should be done, not *how* it could be done. Hence, it is vital to start developing a complete yet detailed understanding of *how* exploration and exploitation can be achieved in PBOs.

Earlier investigations that focus on how to achieve exploration and exploitation at various organizational levels have found that it is heavily affected both by formal organizational and contractual aspects (e.g. hierarchical structures, control mechanisms, formalization, partner selection procedures, forms of payment) (Jansen et al., 2006; Jansen et al., 2008; Koza and Lewin, 1998; Lavie and Rosenkopf, 2006) and informal social aspects (e.g. culture, cooperation, shared vision) (Jansen et al., 2008; Lin and McDonough, 2011; Tiwana, 2008). However, there is a lack of multi-level models studying a broad set of independent variables, in terms of antecedents of exploration and exploitation (Simsek, 2009).

The main literature gaps, which are lack of project and multi-level studies, are addressed in this paper by examining how PBOs in the construction industry can manage the exploration/exploitation paradox at SBU, project portfolio, and project levels. At the project level, procurement procedures affect both formal aspects (e.g. responsibilities and authorities) and informal aspects (e.g. the degree of integration and cooperation among project participants) (Eriksson and Westerberg, 2011). Hence, it seems useful to utilize procurement literature as a reflective frame for understanding how to facilitate exploration and exploitation at the project level. This paper contributes to project management literature by serving as a starting point of a discussion of how PBOs can achieve both exploration and exploitation at different organizational levels.

2. Exploration, Exploitation and Organizational Ambidexterity

Recently, the focus on trade-off relationships in organizational research has been shifted to paradoxical thinking, which is pinpointed in research on the exploration/exploitation paradox (Andriopoulos and Lewis, 2009). Exploration includes things captured by terms such as search, diversity, adaptability, risk taking, experimentation, flexibility, innovation, and long-term orientation. Exploitation on the other hand involves refinement, alignment, control, constraints, efficiency, and short-term orientation (Andriopoulos and Lewis, 2010; Gibson and Birkinshaw, 2004; March, 1991). The organizational capability to achieve both exploration and exploitation is sometimes termed organizational ambidexterity. Although this concept was coined by Duncan (1976), most literature on the subject stems from March (1991) and his seminal work on exploration and exploitation in organizational learning. Accordingly, ambidexterity involves the capability to both exploit existing knowledge and technologies for short-term profits and also explore new knowledge and technologies to enhance long-term development (O´Reilly and Tushman, 2008).

March (1991) argue that firms focusing too much on exploration may suffer the costs of experimentation without gaining many of its benefits due to many undeveloped new ideas. They may then be locked into a vicious failure trap in which failure leads to search and change which leads to more failure. Exploiters on the other hand may obtain short-term efficiency gains based on current competences, leading to success and thereby more exploitation. Due to the direct benefits of exploiting current competences, firms may get stuck in a competence trap. Because of exploration’s greater uncertainty and distance in time and space between the locus of learning and the locus of realization of returns (March, 1991) most organizations focus more on exploitation than on exploration (Uotila et al., 2009). This may result in short-term success but long-term stagnation and failure (O´Reilly and Tushman, 2008). Due to its theoretical importance and practical relevance, research on the ambidexterity subject is burgeoning (Jansen et al., 2008).

In early research, authors have typically viewed ambidexterity in 1) *structural* terms by separating exploration and exploitation activities in different business units (Benner and Tushman, 2003; Duncan, 1976; Tushman and O´Reilly, 1996) or 2) *sequential* terms by temporal separation through focusing on first one type of activity and then the other one (Adler et al., 1999; Duncan, 1976; Gupta et al., 2006). However, recent research suggest that true paradoxical thinking is obtained only when 3) *contextual* ambidexterity is adopted, that is, when there is a capability to simultaneously and synchronously pursue exploration and exploitation within a business unit or work