Available online at www.sciencedirect.com

ScienceDirect

International Journal of Project Management 33 (2015) 1704 – 1716

International Journal of Project Management

www.elsevier.com/locate/ijproman

Research and development project management best practices and absorptive capacity: Empirical evidence from Spanish firms

Silvia Vicente-Oliva [a,*], Ángel Martínez-Sánchez [b,1], Luis Berges-Muro [c,2]

[a] Centro Universitario de la Defensa, Academia General Militar, Ctra. Huesca s.n. 50090 Zaragoza, Spain

[b] University of Zaragoza, Departmento de Dirección y Organización de Empresas, Escuela de Ingeniería y Arquitectura, Campus Río Ebro, C/ María de Luna n° 3, Edificio Betancourt, 50018 Zaragoza, Spain

[c] University of Zaragoza, Departmento de Ingeniería de los Procesos de Fabricación, Escuela de Ingeniería y Arquitectura, Campus Río Ebro, C/ María de Luna n° 3, Edificio Quevedo, 50018 Zaragoza, Spain

Received 4 March 2015; received in revised form 15 June 2015; accepted 1 September 2015
Available online 26 September 2015

Abstract

Evidence from a study carried out in a sample of Spanish firms indicates that research and development (R&D) project management practices are positively related to absorptive capacity of knowledge (AC), although the influence of these practices differs for each AC dimension. Managers realize that learning from past experiences in R&D projects develops the capacity to gain access to relevant external knowledge. However, the positive relationship between management practices and absorptive capacity is only significant for transforming and exploiting external knowledge in R&D projects. The article discusses the managerial implications of improving absorptive capacity within the management of R&D projects and the firm, for every AC dimension.

Keywords: Absorptive capacity; Knowledge management; Managerial practices; R&D project management

1. Introduction

The innovation literature highlights the importance of external knowledge for solving technical problems within a firm. Innovation management frequently involves the integration of knowledge from market demand and scientific and technological developments (Rohrbeck and Schwarz, 2013). Thereby, there is a pressure to bring products to the market, at the same time as facing uncertainties on market, technologies, production costs, and the development process itself (Balachandra and Friar, 1997). This means that firms increasingly need more new external knowledge which may be hard to find, assimilate, and include in research and development (R&D) projects, and it could even consume unexpected resources.

From a strategic perspective, the resources-based view of the firm is considered a framework for explaining how organizations achieve sustainable competitive advantages throughout the accumulation of valuable, rare, inimitable, and non-substitutable resources (Armstrong and Shimizu, 2007; Barney, 1991, 2001; Wernerfelt, 1984). However, the firms can create, extend, or modify its resources base on purpose (Helfalt et al., 2007) by acquiring and using new knowledge, thanks to their dynamic capabilities. These are characterized by the 'firm's abilities to integrate, build, and reconfigure internal and external competences to address rapidly changing environments' (Teece et al., 1997, p. 516). Moreover, the dynamic capabilities are the antecedent to the organizational and strategic routines (Eisenhardt and Martin, 2000) and they have been applied lately to project management, i.e. Killen et al. (2012), Leal-Rodríguez et al. (2014).

* Corresponding author. Tel.: +34 976739878.
E-mail addresses: silviav@unizar.es (S. Vicente-Oliva), anmarzan@unizar.es (Á. Martínez-Sánchez), bergesl@unizar.es (L. Berges-Muro).
[1] Tel.: +34 976761000x84 5024; fax: +34 976762189.
[2] Tel.: +34 976761898; fax: +34 976762235.

http://dx.doi.org/10.1016/j.ijproman.2015.09.001
0263-7863/00/

The absorptive capacity of knowledge (AC) is considered a dynamic capability by some scholars (Escribano et al., 2009; Fosfuri and Tribó, 2008). It may also contribute to R&D project performance by taking into account the external influences as a learning factor (Biedenbach and Müller, 2012), and it is a related concept to creativity and organizational learning at a micro level (Ojo et al., 2014). The capacity of a firm to evaluate and acquire external knowledge is called potential absorptive capacity (PAC), whereas realized absorptive capacity (RAC) reflects the firm's capacity to leverage absorbed knowledge and exploit it into innovation (Arora and Gambardella, 1994; Cassiman and Veugelers, 2006; Jansen et al., 2005; Zahra and George, 2002).

PAC is considered to be a process of combining capabilities. It is a determinant of strategic innovation and an antecedent of organizational learning (Gebauer et al., 2012; Lane and Lubatkin, 1998). Knowledge acquired by exploration activities could sustain R&D actions and allow new competences to be developed (Danneels, 2002, p. 1104). RAC is effective in using the resources and competences incorporated into a firm in the short-term, but firms cannot exploit knowledge that has not previously been assimilated (March, 1991). Exploitation activities are related to organizational learning (Sitkin et al., 1994) because acquired knowledge is a resource that is ready to be used inside the firm. However, each dimension of AC is related to innovation outputs in a different way, and therefore project teams may experience difficulties in managing the levels of PAC and RAC (Jansen et al., 2005).

The relevance of management theories for managerial practice is a topic of frequent debate in academic journals and at professional conferences (Blomquist et al., 2010). Nevertheless, we have found a gap in the theory between managerial practices in R&D projects and the creation of AC. Although there has previously been some empirical analysis (e.g., Besner and Hobbs, 2012) that identifies groups of project management toolsets for different types of projects, and a few theoretical insights that discuss how organizations are able to learn from their projects, we think there is still insufficient practical, insightful, and scholarly knowledge that explains the contribution of R&D project managers to a firm's capability to acquire, transform, and exploit external knowledge (Bakker et al., 2011; Biedenbach and Müller, 2012; Mitchell, 2006). The aim of our research as a whole is to provide an answer to the question, 'Can project management practices improve the AC of a firm in any way?'

In order to answer this research question, we have used the dialogical model that was designed to allow a dialog between practitioners and researchers who offer complementary visions of a research question (Avenier and Cajaiba, 2012). According to this model, we first identify the gap in academic research and then we formulate the appropriate research question. The dialog between academics and experts shows that research topics can be contrasted with practical experience, and that is able to extrapolate from that dialog in order to reach conclusions. The Avenier's model sets the construction of the conceptual knowledge after the elaboration of local knowledge that we base on an interview carried out to practitioners (project managers). After that, we communicate the results to academic and professional audiences through specialized media, in order to inform the practitioners and obtain their feedback. The last step of the model is the knowledge activation to put them to practical use, 'it can permit the appropriation of the knowledge, i.e. the integration of this knowledge intro the individual's prior knowledge' (Avenier, 2009), and our joint efforts are driven toward it throughout the collaboration with regional associations.

We structure the paper as follows. In the next section, we review the literature on R&D project management related to organizational learning and AC, in the light of the knowledge context inside a firm. After that, we describe the research methodology and the procedure for data collection. Finally, we present our analytical results and discuss them on the basis of the theoretical and managerial insights.

2. R&D project management and absorptive capacity

As a result of increasing competitive pressures, many firms nowadays are modifying their technology strategies. Furthermore, they are emphasizing the flexibility of their organizations, adopting improved processes, and focusing more on consumers, with customized goods and services. At the same time, firms also need more new ideas for adopting technologies, accessing new markets, and implementing business models, so they put pressure on their R&D departments (among others) to initiate and implement projects to fulfill these demands. A project is described by Dvir and Shenhar (1996) as an organizational concept that triggers the process of resolving new problems and improving organizational capabilities (Koskinen, 2011; Wang and Ahmed, 2007). R&D projects have increased in complexity (Gunasekaran, 1997) and widened their focus; they now have a vision of a future state (Turner, 2009, p. 2) for the products and processes of a firm and its organizational structure.

The most striking feature of R&D projects is the fact that the outcomes might be very different from the initial specification but still valuable for the firm (UNE166.001, 2006). International associations like the Project Management Institute (PMI) and the International Project Management Association (IPMA) promote the standardization of project management, although they respect the singularities of each project. According to the Project Management Body of Knowledge (PMBOK) (Project Management Institute, 1987), many managerial practices like the definition of responsibilities, cost estimate and control, and resources and time planning (and re-planning) are frequent among all kinds of projects. However, managing some legal issues such as intellectual property rights (IPR), standard certifications for new electromagnetic products, phases for the approval pharmaceutical products, strategies for the exploitation of results, etc., may be susceptible to separate studies of R&D projects.

2.1. R&D managerial practices and organizational learning

The methodologies and components of project management are well documented, and the literature offers many useful project management toolsets (Besner and Hobbs, 2012; Pinto and Slevin,