INFLUENCE OF TECHNOLOGICAL DISTINCTIVE COMPETENCIES AND ORGANIZATIONAL LEARNING ON ORGANIZATIONAL INNOVATION TO IMPROVE ORGANIZATIONAL PERFORMANCE

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Abstract

The introduction of new technologies has become critical for the maintenance and improvement of organizational competitive advantages. In this context, various studies have highlighted the importance of top management support in the process of effective implementation of new technologies. However, and beyond that, little research has been carried out to show the impact that this support has on other organizational competencies/capabilities that have to do with technology and that are becoming especially relevant in enabling business performance, like technological distinctive competencies and organizational learning. The aim of this paper is to develop a theoretical framework for assessing the impact that top management support of technology has on technological distinctive competencies and organizational learning, in order to show how all of these affect organizational innovation and organizational performance. This study suggests that top management should foster new technologies to improve technological distinctive competencies and organizational learning, since both have positive effects on organizational innovation and organizational performance.

Keywords: technological distinctive competencies, organizational learning, organizational innovation, organizational performance.

JEL Classification: 032, 033, Q55.

Introduction

Technology and its relationships to organizational structures, processes and results have been conceived as an important subject of interest for organizational researchers (Orlikowski, 2000), since they enable organizations to develop products or delivery of services more quickly in highly competitive situations on a global level, as well as continuous technological change and ever shorter product life cycles (García et al., 2007b).

In this context, Top Management Support (T.M.S.) of technology is crucial. Although some authors have shown that this support is essential for the successful implementation of specific technology, such as information systems (Dong, 2008; Wixom & Watson, 2001), there are few studies in the existing literature on how this support affects the process of technology implementation in general. For this reason, we must take into account a much wider concept of technology, that of a “body of knowledge, tools, and techniques, derived from both science and practical experience, that is used in the development, design, production and application of products, processes, systems, and services” (Abetti, 1989, p. 37).

An aspect that merits special attention has to do with the impact that T.M.S. has on other organizational competencies/capabilities that are related to technology and that are becoming especially relevant in enabling business performance. Nowadays, firms are under increasing pressure to foster organizational learning and develop, strengthen and renew technological competencies, as these competencies enable them to adapt, integrate and reconfigure their abilities, knowledge and technological capacities to adapt to the changing business environment and deliver value to the customer in the appropriate form, responsibly and continuously (Wang et al., 2004).

On the one hand, organizational learning has been defined as a collective capacity based on experiential and cognitive processes and involving knowledge acquisition, knowledge sharing, and knowledge utilization (Aragón et al., 2007; Zollo & Winter, 2002). On the other hand, technological competencies have been accepted as one of the important elements of organizational “core competencies” (Banerjee, 2003). Technological Distinctive Competencies (T.D.Cs.) include, among others, the capacities to obtain information on the state and progress of the relevant science and technologies, to generate advanced technological processes, to update and introduce new innovations based on technologies, to attract and retain qualified technical personnel, to achieve the technological differentiation of products and to assimilate new technologies (Real et al., 2006). Prior studies state that firms possessing T.D.Cs. and promoting...
organizational learning tend to be more innovative, that is, tend to adopt new ideas or behaviours (Damanpour & Wischnevsky, 2006) more easily, obtaining much better performance (McEvily et al., 2004).

Based on the foregoing, the purpose of this paper is to develop a theoretical framework, based mainly on empirical papers, to stress the importance of T.M.S. in the effective adoption and implementation of new technologies in organizations and, more specifically, in the generation of T.D.Cs. and organizational learning. Further, it will present the effects of T.D.Cs. and organizational learning on organizational innovation and will show how this influences organizational performance, to highlight how everything affects organizational competitive position.

**Theoretical background and Propositions**

**The influence of T.M.S. on T.D.C and Organizational Learning**

Business environments, and society in general, have been undergoing constant transformation in recent years by a series of factors, among which are globalization, the knowledge revolution and the rapid dissemination of new technologies (Ireland & Hitt, 1999). So great is the importance of this last factor that different authors have shown how firms should adopt and assimilate these technologies if they wish to maintain and improve their competitive advantage (Lee & Grewal, 2004). Along these lines and given their importance, the literature on management has focused recently on the ability of organizations to develop and exploit abilities and critical competencies on the global market (Steenisma, 1996; Wu, 2009), among which we find T.D.Cs. (Teece et al., 1994). On this point, we must stress the decisive role of management, which we will analyze in the following.

T.M.S. may, through the deployment of different managerial abilities related to technology such as the ability to identify technological projects (Melville et al., 2004), be related to the generation of sources of T.D.Cs., since among these are included the capacities for exploration or exploitation of technological opportunities (Huang, 2011). Likewise, the promotion and securing of resources devoted to R&D in technology, as well as the measure of support from management (Byrd & Davidson, 2003), brings the stimulation of organizations’ T.D.Cs. These affect the work climate of R&D (which represents a source of technological competencies), the ability to link the R&D plan with the competitive strategy, the capability of achieving effective collaboration with other organizations in R&D, and effective installation of programs oriented to the development of technological competencies (Huang, 2011; Real et al., 2006). Such effects also occur when management takes charge of facilitating technology transfer through the firm—which has different levels of the transfer of expertise or know-how, since much knowledge is incrusted in technology (Malik, 2002)—and promotes the creation of T.D.Cs., such as the capability to develop knowledge management programs that guarantee the ability to generate technology or to absorb it from other organizations (Real et al., 2006). Based on the foregoing, we arrive at the following proposition:

**Proposition 1:** T.M.S. will be positively related to T.D.Cs.

Because scientific and technological advances are being produced constantly (Linksman, 1996) and because market needs change continuously, organizations must learn to be increasingly quick in responding satisfactorily to turbulent and uncertain environments (Lynn et al., 2003). The greater the commitment from the organization’s management to implement new technologies and the more resources it devotes to this end, the more the processes it will encourage that integrate organizational learning. We find a clear example when the introduction of new information technologies is supported. These cases incorporate at the organizational level an important factor for the design of learning organizations in providing an infrastructure to store, access and review some of the elements that make up organizational memory (Robey et al., 2000).

At the same time, management can support another series of actions to facilitate organizational learning. When technology transmission projects are fostered in the firm, they essentially promote tasks of knowledge accumulation and, more specifically, of knowledge creation, acquisition and retention (Daghfous, 2004, Gupta & Govindarajan, 2000). These include processes that integrate organizational learning. On the other hand, when firms make a commitment to carry out processes of the development of new technologies, they are really fostering learning processes based on the creation of new knowledge (Manaiikkanäkl, 2007).

In sum, top management performs a crucial role to generate greater organizational learning not only because it is responsible for securing the financial and personnel resources necessary (Thong et al., 1996), but also because it is critical in promoting changes at the organizational level (Dong, 2008). Based on the foregoing, we arrive at the following proposition:
Proposition 2: T.M.S. will be positively related to organizational learning

The influence of T.D.Cs. and organizational learning on organizational innovation

In recent years, different studies have shown that organizational innovation is essential for organizational survival (Cavusgil et al., 2003; Han et al., 1998; Hurley & Hult, 1998). Given this situation, the set of competencies that each organization possesses plays a key role in the development of organizational innovation, since without these competencies the organization could not innovate in response to the rapid technological changes (Ahuja, 2000). Among these competencies, T.D.Cs. merit special attention, as they enable understanding, use and exploitation of state-of-the-art technology internally (Ritter & Gemünden, 2004).

Diverse studies have stressed the existence of a positive relationship between T.D.Cs. and organizational innovation. DeCarolis (2003) stresses that one of the basic functions of T.D.Cs. is the exploitation of technological knowledge in order to develop organizational innovations satisfactorily. Tarafdar & Gordon (2007) show that, in the field of information systems, T.D.Cs. affected the conception, development and implementation of process innovations. Cantwell & Fai (1999, p.333) indicate that “while on the surface innovation is commonly observed through the market phenomena of the emergence of new products and the diversification of existing products, the underlying capacity to change what markets receive is provided by the corporate capability to create and refine to a viable point new products and processes, which rests on the cumulative generation of technological competence in firms”. Thus, we arrive at the following proposition:

Proposition 3: T.D.Cs. will be positively related to organizational innovation

Organizational innovation depends on the knowledge base that the organization possesses, generated by organizational learning (Cohen & Levinthal, 1990; Nonaka & Takeuchi, 1995). This is a strategic variable not only in new firms that introduce new products or create new markets but also in already established firms that need to innovate continuously to face the threat caused by the disruption, for example, of new technologies (Cefis & Marsili, 2005). It is necessary to stimulate the development of factors that drive innovation, that enable the constant search for and introduction of new ideas, products, services, systems, policies, programs and processes before other firms in the environment do so (Lloréns et al., 2005).

The process of organizational learning consists of the acquisition, dissemination and utilization of knowledge, which is related to innovative performance (Argote et al., 2003). Organizational learning “supports creativity, inspires new knowledge and ideas and increases the potential to understand and apply them, favours organizational intelligence and (with the culture) forms a background for orientation to organizational innovation” (García et al., 2007b, p. 535). It is essential for organizations to possess the abilities necessary for a learning organization or for evolving with the goal of potentially acquiring these abilities (Gilbert & Cordey-Hayes, 1996), since organizations with high levels of commitment to learning tend to achieve much greater innovative orientation and activity (Ussahawanitchakit, 2008). Thus, we arrive at the following proposition:

Proposition 4: Organizational learning will be positively related to organizational innovation

The influence of organizational innovation on organizational performance

Previously, we have proposed that T.D.Cs. and organizational learning enhance organizational innovation. This is an important aspect to consider since different studies have shown that not promoting innovative projects and activities influences both organizational productivity and performance negatively (Lööf & Heshmati, 2002).

Taking into account the rapid market changes occurring constantly in consumers’ preferences and demands, competitors and technology (Calantone et al., 2003), those firms that possess greater innovation capacity will be able to respond better to the turbulence in the environment (Jiménez & Sanz, 2011). Some authors have shown that firms that adopt innovative product portfolios obtain a positive impact on organizational performance (Cho & Pucik, 2005). García et al., (2007a) stress that innovation and its capacity to improve organizational performance occur not only in large organizations but also influence small and medium-sized firms. In spite of having a smaller quantity of resources, these firms benefit from other aspects that stimulate innovation, such as greater flexibility, shorter decision chains, greater facility for
detecting errors and learning from them, greater affinity with values and styles of leadership that facilitate communication and knowledge transfer, greater capacity for customization and higher employee motivation, among others (García et al., 2007a; Vossen, 1998).

Finally, we can conclude that organizations continuously subjected to dynamic and changing environments innovate with the intention of improving their performance and effectiveness at the entrepreneurial level, grounding this conclusion on the positive relationship between organizational innovation and organizational performance (Aragón et al., 2007; Hurley & Hult, 1998; Thornhill, 2006). Based on the foregoing, we arrive at the following proposition:

Proposition 5: Organizational innovation will be positively related to organizational performance

Conclusions

The introduction of new technologies in organizations has been conceptualized as a key issue recently, as these organizations must continually face turbulent and changing environments (e.g., Byrd & Davidson, 2003; Thong et al., 1996). Taking previous studies into account, this article provides a broader theoretical perspective that has received little analysis in the literature until now, establishing a model in which we determine the effect of the T.M.S. of technology on T.D.Cs. and organizational learning, also taking into account the positive influence of this support on organizational innovation and organizational performance.

Organizations should thus promote the presence of top managers who support the processes of implementation of new technologies. Managers must know what value new technologies can bring and how to link technological capabilities with the firm’s basic competencies (Berry & Taggart, 1998), enabling them to achieve considerable organizational advantages. Therefore, managers should stress the fostering of T.D.Cs, organizational learning and organizational innovation, since they constitute strategic dynamic capacities that can have positive effects on improving organizational performance (Hurley & Hult, 1998; Real et al., 2006).

On the one hand, organizational learning can be fostered by top management’s stimulation of a shared vision, which serves as a vehicle for members of the firm to achieve commitment to this vision and which facilitates both the management process and the dissemination of learning to reach all levels of the organization (Senge et al., 1994). On the other hand, T.D.Cs. can be fostered by stimulating technological skills, which can be encouraged with the support of top management through a new and broader type of training (Swamidass & Nair, 2004). In this way, organizations will find themselves in a better position: 1) to create and distribute innovative products or services, 2) to respond to turbulence in the environment and 3) to take advantage of the technological opportunities that are generated continuously. These activities will contribute to improving their organizational performance and competitive position.

Finally, it is relevant to point out that, owing to the increasing importance of the topic presented, additional empirical research should be carried out in the future.

References


