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## Journal of Engineering and Technology Management

journal homepage: [www.elsevier.com/locate/jengtecman](http://www.elsevier.com/locate/jengtecman)



# Technological distinctive competencies and organizational learning: Effects on organizational innovation to improve firm performance

María Teresa Bolívar-Ramos<sup>\*</sup>, Víctor J. García-Morales<sup>1</sup>,  
Encarnación García-Sánchez<sup>2</sup>

University of Granada, Faculty of Economics and Business, Campus Cartuja, s.n., Granada 18071, Spain

### ARTICLE INFO

#### JEL classification:

O32  
O33  
Q55

#### Keywords:

Top management support  
Technological distinctive competencies  
Organizational learning  
Organizational innovation  
Organizational performance

### ABSTRACT

This paper analyzes how top management support of technology influences the generation of technological skills, technological distinctive competencies and organizational learning. The research also examines the effects of technological distinctive competencies and organizational learning on organizational innovation and reflects how all of these variables impact organizational performance. The results of our empirical analysis, based on a sample of 201 Spanish technological firms, suggest that: (1) top management support positively influences the generation of technological skills, technological distinctive competencies and organizational learning; (2) technological distinctive competencies and organizational learning positively affect organizational performance, directly and indirectly through organizational innovation.

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### Introduction

Recently, firms have been operating in business environments characterized by rapid change and increasing competitiveness (Hitt et al., 2000). In this context, technology and technology 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

<sup>\*</sup> Corresponding author. Tel.: +34 958 24 95 96; fax: +34 958 24 62 22.

E-mail addresses: [bolivar@ugr.es](mailto:bolivar@ugr.es) (M.T. Bolívar-Ramos), [victorj@ugr.es](mailto:victorj@ugr.es) (V.J. García-Morales), [encags@ugr.es](mailto:encags@ugr.es) (E. García-Sánchez).

<sup>1</sup> Tel.: +34 958 24 23 54; fax: +34 958 24 62 22.

<sup>2</sup> Tel.: +34 958 24 95 96; fax: +34 958 24 62 22.

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 Morales et al., 2007b).

When faced with such scenarios, firms must innovate continuously to guarantee their organizational survival (Hurley and Hult, 1998). Innovation must be driven by the capability to exploit organizational competencies, technologies and knowledge in order to stimulate competitive advantages (DeCarolis, 2003). Firms are under increasing pressure to foster “organizational learning” and develop, strengthen and renew “technological competencies.” These competencies enable firms to adapt, integrate and reconfigure their skills, knowledge and capabilities. In doing so, they adapt to the changing business environment and deliver value to the customer in the appropriate form, responsibly and continuously (Wang et al., 2004; García Morales et al., 2007b).

This research presents a model to analyze the importance of top management support in the effective adoption and implementation of new technologies in organizations and, more specifically, in the generation of technological distinctive competencies, technological skills and organizational learning. This study will also contribute empirical evidence of the effects of technological distinctive competencies and organizational learning on organizational innovation and demonstrate how all of the foregoing influence organizational performance. Prior studies have analyzed the relation between some of the foregoing constructs; for example, support from management and effective implementation of specific technologies, such as information systems (Young and Jordan, 2008) and the influence of technological distinctive competencies on organizational performance (Lee et al., 2001; Wang et al., 2004). There is, however, no integrated model of all of these systems in the literature, nor is there a model that focuses on the broad concept of technology. We would also point out that the analysis proposed does not only explain how to achieve improvement in organizational performance through direct relationships with strategic variables such as technological distinctive competencies and organizational learning. This analysis also introduces indirect relationships, in this case through innovation, which can achieve the same goal. We therefore find an innovative model with great potential that enables organizations not only to survive in turbulent and changing environments but also to improve their competitive position. We will perform this analysis within the framework of technology firms. We choose this type of firm because of the current importance of technology firms in modern economies, due to the contribution of technology firms to economic growth, increase in productivity and creation of new, innovative industries, products and processes (Grinstein and Goldman, 2006).

This study provides an explanation of the crucial role that top management support of technology plays in the process of stimulating technological skills, technological distinctive competencies and organizational learning. Top management includes the “CEO and its direct subordinates responsible for corporate policy” (Green, 1995, p. 223). Different studies have shown that, when top management’s level of support and commitment is perceived as high, it is logical to expect the success of the system (Ifinedo, 2008). Managers must be willing to allocate adequate capital and human resources (Carbonell and Rodríguez Escudero, 2009). Although some authors have shown that this support is essential for the successful implementation of specific technology, such as information systems (Dong, 2008), few studies in the existing literature analyze how this support affects the process of technology implementation in general. We must therefore take into account a much wider concept of technology: a body of knowledge, tools, and techniques derived from science and practical experience and used in the development and application of products, processes, systems, and services (Steensma, 1996).

The influence of top management support on technological distinctive competencies may also be stimulated by the development of technological skills, which in a technological context refer to both firm-specific techniques and scientific understanding (Leonard-Barton, 1992). These skills provide the basis for a firm’s competitive competencies (Teece, 1986). The “myth of deskilling” wrongly encourages managers to expect that new equipment will enable a reduction of required skills. This myth is one of the greatest obstacles to the effective implementation of new technologies (Swamidass and Nair, 2004). The generation of required skills is thus a crucial question, since the generation of skills can also have repercussions for the generation of competencies, as competencies reflect a set of skills and technologies (Peppard and Ward, 2004). Another important issue is determining how the top management support can foster organizational learning. The promotion of continuity, commitment, capability, contribution, collaboration and consciousness of organizational learning

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