Journal of Business and Economics, ISSN 2155-7950, USA
December 2017, Volume 8, No. 12, pp. 989-1008
DOI: 10.15341/jbe(2155-7950)/12.08.2017/002

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Explaining E-Business Adoption and Use: Development of a Measurement Model from the Perspective of Knowledge Management

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Abstract: Small and Medium Enterprises (SMEs) are the backbone of the economy, and they significantly benefit from Knowledge Management (KM) to develop competitiveness throw innovation, however the extant literature has little empirical support for this statement. Dating from the early 1990s, the increased use of technology has brought about numerous changes in the business world, and electronic business (e-business) has become a paramount innovation for business. This technology not only introduced a new way of doing business, but also has become a vital part of peoples' lives. The purpose of this paper is to develop a research model aimed to explain e-business adoption (EBA) at firm level, from the perspective of the Knowledge Management View (KMV).

Design/methodology/approach — Using the literature review this paper develops a theoretical construct aimed to explain EBA in SMEs. It initiates with an introduction to the study of KM, to further deepen into the roots of the knowledge theory and traces its evolution into KM. Then, the relation is analyzed between KM and innovation and deepens into the relation between KM and EBA. Finally, a conceptual framework is constructed and research propositions are developed in order to establish EBA as a dependent variable that can be explained by KM.

Originality/value — Although studies on Internet adoption by businesses have proliferated in the last few years, this kind of research has, however, been limited or null in some developing countries like Mexico and only few studies have been developed to study explain e-business EBA in SMEs from the perspective of KM. The proposed model is part of a theoretical-empirical research project aimed to explain e-business adoption in Mexican SMEs

Practical implications – This study addresses the previous scarcity of literature on the relationship between KM processes and EBA. Past studies have mainly focused on studying EBA using variables such as environmental, organization attributes as well as innovation's attributes. These results have implications for e-business managers in formulating policies and targeting appropriate organizational capabilities to ensure the effective adoption of e-business, nevertheless, the research model needs to be tested empirically to prove its real value. To test propositions and find variation in EBA adoption, quantitative analysis of a large sample of firms is necessary. The obvious choice is a survey. Further work is needed to operationalize the constructs and develop a

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detailed empirical research method.

Key words: e-business; adoption; knowledge management

JEL codes: M21

1. Introduction

Small and Medium Enterprises (SMEs) are an important part of most economies, they provide employment, generate innovation, create wealth, reduce poverty, enhance standard of living and contribute to the society in which they operate. The strength of SMEs lies in motivation, internal networking, and tacit knowledge in unique skills, shorter informal communication, less bureaucracy and greater proximity to market (Desouza & Awazu, 2006). But SMEs face resource, finance and skills scarcity and managers — particularly in underdeveloped countries — often do not have enough managerial expertise and organizational capabilities, which imply poor strategic business planning and human resource management (Balestrin et al., 2008; Cocca & Alberti, 2010). KM implementation is said to be the best way to overcome these problems and improve SMEs' ability in innovation and organizational performance (Asoh et al., 2007; Bierly & Daly, 2007; Brachos et al., 2007; Chang & Lee, 2008; Ho, 2008; Chen & Huang, 2009; Sáenz, 2009; Yang, 2009; Zack et al., 2009). For instance, through an extensive review of studies analyzing the KM-innovation relationship, Darroch and McNaughton (2002) conclude that KM generation practices generally share an association with innovation performance. In this regard, numerous scholars find positive connections between R&D efforts to generate new ideas and innovation (e.g., Capon, Farley, Lehman, & Hulbert, 1992; Zahra & Bogner, 1999). KM provides the means for SMEs to overcome poor business environment and to change the complex business environment to be manageable (Saini, 2015), thus, effective KM emerges in the literature as a method for improving the firm's innovation capacity. Other lines of research also illustrate a positive link between the acquisition of market knowledge or knowledge from employees, and innovation (e.g., Li & Calantone, 1998; Lynn, Reilly, & Akgun, 2000). Finally, there are also some studies specifically linking KM to EBA, nevertheless, they are scarce, and mot of them have been empirically tested in developed economies.

2. Origins and Evolution of Knowledge Management

The study of the KM can be traced up to the origins of the Theory of the firm (TF), and the pioneering attempts of some of the different economic theories included in the TF that explain and predict the nature of the company, firm or corporation, including its existence, behaviour, structure and relation with the market. Already since strategy was identified as the fundamental part of the efforts of top management and firm intelligence, and information and knowledge become clearly essential. Nevertheless in the academic works of those pioneering times, little efforts are observed towards the comprehension of the managerial or organizational knowledge per se (Spender & Grant, 1996), the approach being more towards identifying the knowledge content, more than towards what knowledge had to be known or the way of acquiring it or understand it. It was only until the sixties that the neoclassic theory of the firm became seriously questioned by alternatives as the managerial and behavioural theories, and focus in researching knowledge turned towards understanding knowledge acquisition and management. To a great extent, this shift depended on Herbert A. Simon's work in the fifties about behavior in situations of uncertainty, Simon stated that "the persons possess limited cognitive capacity and therefore only can exercise" limited rationality "when they take decisions in complex and uncertain situations". As Spender and

Grant (1996) argue, the beginning of this paradigmatic change, initiated with the pioneering works of Simon (1947) with his critique of the economic rationality and his attempts of tying organization and economy. This paradigm shift continued with the works by Michael Polanyi (1962) and those of other philosophers and psychologists as Jerome Bruner, which focused to studying the nature of the human knowledge and its relation with the human action. Therefore, is at the beginning of SXX, that different economic theories have studied the knowledge and its management as an interesting and important factor for generation of competitiveness and value. According to Penrose (1959), "the economists have always recognized the dominant role that the increase of the knowledge plays in the economic process". How to acquire and use knowledge is considered from different perspectives, for example, Marshall (1965), a classic economist, holds that the capital is formed to a great extent by the organization and knowledge, and raises that "knowledge is our more powerful engine of production". The Austrian school of economy of Hayek and Schumpeter for his part analysed the importance of knowledge in the economic matters. Hayek (1945) classified knowledge under scientific knowledge and specific or contextual knowledge, while Schumpeter (1951) emphasized the importance of combining explicit knowledge. In fact, Schumpeter pointed out the importance of combinations of knowledge for the development of new products, production methods, and organizations. Moreover, Penrose (1959) focused to studying growth of individual firms by using mental models to evaluate their strengths and weaknesses.

The scientific and humanistic visions were synthesized by Barnard (1938), who emphasized in the importance of conduct in the processes of KM. Polanyi (1966) emphasized this behavior or not linguistic process of mental knowledge, defining it as tacit knowledge. March and Simon (1958), constructed a scientific theory aimed at problem solution and decision making based on the concept of 'limited rationality', including in it, the human process of thinking. Simon (1993) holds, that knowledge is used for deciding the course of actions and analyse the consequences of every strategy formulated by the executives.

Continuing the evolution of the current concept of knowledge, Porter (1980, 1985) developed famous model of five forces for competitive analysis of firm advantages in an industry and his model of "chain value". Both models assume the relevancy of knowledge in the strategy of the organization. But it was Drucker (1993) who suggested the term "knowledge society" and the role of the worker in this society. In this respect, it was Quinn (1992) who established the key points for the configuration of intangible values (technological knowledge).

Knowledge and the firm capacity for learning represent the solution for many organizations that suffer a technological intensive change. Argyris and Schon (1978) defended the need of an organization to adapt to changes using two types of learning: single circuit and double circuit. In 1990, Senge proposed 'the learning organization' as a new paradigm. At the same time, Prahalad and Hamel (1990) offered a new approach based on the resources seen as competences, capacities, skills and strategic assets. They defined competitive sustainable advantage based on the firm's core competences.

It is in the 80s, when culture begins to be studied in its relation for the construction of knowledge and his entailment with learning. Schein (1985) argued that culture is a learned product derived from an experience of a group and Pfeffer (1981) defined the organizations as 'a system of meanings and shared beliefs'.

From Nonanka and Takeuchi, (1995) organizational culture is visualized as the beliefs and knowledge shared by the members of the company. As they seek to discover how organizations create new products and new internal processes, the importance of the concept of knowledge is redefined (Nonaka & Takeuchi, 1995). According to these authors, knowledge creation is carried out in three levels: individual, group, and organizational level.

3. The Knowledge Based Theory

The knowledge-based theory of the firm considers knowledge as the more strategically significant resource of a company. His defenders argue that due to the fact that knowledge-based resources are generally difficult to imitate and socially complexes, the bases and heterogeneous knowledge capacities among companies are the principal determinants of a competitive supported advantage and a basis for superior corporative performance. This knowledge is incrusted and is carried out across multiple entities, including the organizational culture, the identity, policies, routines, documents, information systems and employees. This perspective is based on the RBV of the company initially promoted by Penrose (1959) and later extended by others (e.g., Wernerfelt, 1984; Barney, 1991; Conner, 1991).

Though the RBV recognizes the important role of knowledge for the organizations to achieve competitive advantage, the defenders of the knowledge-based view (KBW) argue that the RBV does not go far enough. Specifically, the RBV treats knowledge as a generic resource, instead of having special characteristics. Therefore, it does not distinguish between different types of knowledge-based capacities. It is based in this belief this belief has been formalized KBW (Grant, 1996, 1997; Spender & Grant, 1996). The KBV then, has its roots in the RBV of the firm, which focuses on strategic assets as the main source of competitive advantages (Amit & Schoemaker, 1993) but in contrast, under the KBV, knowledge is the main strategic resource, which, when properly managed, allows the firm to create value from its exploitation of production (DeCarolis & Deeds, 1999; Zack, McKeen, & Singh, 2009), therefore, companies must protect, develop and integrate organizational knowledge to create value.

3.1 Knowledge Management

KM is defined as "a cyclic process aimed to identify, transfer, store and spread knowledge in order to re-use it, to report, share and to learn this knowledge in the whole organization" (Wang, 2007, p. 30). Previous studies have proposed key dimensions for KM that includes acquisition, dissemination and application of knowledge (Chen & Mohamed, 2006; Fahey, Srivastasa, Sharon & Smith, 2001: McAdam &Reid, 2001).

Nonaka (1991) raises that in the highly competitive climate of these days, where the only certain thing is uncertainty, knowledge is the main differentiator factor for business success and at present, is visualized by several authors as the core foundation for competitiveness (Davenport, 1998; Drucker, 1993; Hall, 1993; Nonaka, & Takeuchi, 1995; Stalk, Evans, & Shulman, 1992; Carlucci, Marr & Schiuma, 2004).

In the last past decades, the emphasis in knowledge resources and organizational competences, has helped to create to a great extent a wide recognition of the strategic role of the intangible resources for the managerial success. From this fact, there have been produced several theoretical and practical contributions, in which there is outlined the importance of knowledge and intangible resources for the improvement of firm performance (Schiuma, Lerro & Sanitate, 2008). As consequence of the recognition of knowledge as strategic resource on which the competitive success of the firm is based, a wide literature has developed in the last decade on KM. A review of this literature reveals numerous interpretations of KM due to a wide range of interests and perspectives (Carlucci & Schiuma, 2006). As a consequence, a considerable ambiguity exists in the terminology, which has led to a fragmented dialog on the topic (Bollinger & Smith, 2001). Nevertheless, two principal characteristics of KM arise of the several definitions of the term (Beijerse, 2000; Lee & Yang, 2000: Quintas, Lefrere, & Jones, 1997; Ruggles, 1998; Sveiby, 1997; Teece, 2000; Wiig, 1997b). These characteristics are important in order to understand the relevancy of KM inside an organization. The first characteristic refers to the managerial facet of KM and deals on how to manage the firm knowledge. It reflects the dynamics of KM as a set of processes related

to the use, development, renovation and creation of knowledge value (Wiig, 1997b). These processes can adopt different forms according to the needs and characteristics of the organization system in which they are implemented. The second characteristic is more worried by the organization of KM and implies a more static notion of knowledge as an asset that affects the company value and its aptitude to generate value (Carlucci & Schiuma, 2006).

The explosion of KM of literature of the last decade is notable for the mixing of his approach, so much practical as academician. The literature reports now two different generations to approach KM, and argument the entering into a third one (Firestone & McElroy, 2003; Gorelick & Tantawy- Monso, 2005; Metaxiotis, Ergazakis, & Psarras, 2005; Scholl et al., 2004). The initial explorations of the KM concept (the first generation) took a technological approach. In these works KM is defined as a tactical matter to being handled by means of internal networks and other information technologies (IT) across which the members of an organization were capturing, sharing, storing and recovering information.

The generational development of approaches towards KM in the literature reflects (a) the gradual integration of different disciplinary perspectives (from IT up to behavior sciences), and associated with (b) changeable perspectives on the nature of the knowledge and therefore his management in an organizational environment (Alavi & Leidner, 2001). Recently, some authors affirm that there are arising approaches of third generation to KM (e.g., Metaxiotis, Ergazakis, & Psarras, 2005; Scholl et al., 2004). These approaches expand beyond the first and second generation, attending to the questions of TI and the social/behavioral dimension, by means of integration with the strategies and aims of the firm.

4. KM and Innovation

According to the literature as the management in the organizations becomes modern, the value of knowledge increases (Carneiro, 2000; du Plessis, 2007; Hung, Lok, Ya-Hui & Wu, 2008; Halawi, Aronson & McCarthy 2005). Carneiro (2000) affirms that knowledge becomes progressively more useful due to the fact that the administration has experienced before the value of creativity, on which depends the transformation of a form of knowledge into another one. Nonaka (1991) argues that “when the markets change, the technologies proliferate, the competitors multiply and the products become obsolete overnight, the successful companies are those that create knowledge in a consistent form and spread it at the whole length and width of the organization and incorporate rapidly new technologies and new products”. Bontis, Dragonetty, Jacobsen, and Roos (1999) argue that “knowledge is the current engine of the managerial life” whereas Savage (1990) indicates that the capacity of creation of wealth of the company is based on the knowledge and the capacities of his people.

Nowadays, many companies see themselves as learning organizations that prosecute the aim to constant improve his knowledge assets (Senge, 1990). This means that knowledge assets are strategic fundamental levers to manage the performance of the business and the constant innovations of a company (Marr & Schiuma, 2001; Mouritsen, Bukh, Larsen, & Johnson, 2002; Quinn, 1992; Boisot, 1998). Organizations experience the competitive advantage of innovations as they face a globalized knowledge economy. Therefore KM has evolved as one of the most important sources of competitive advantage (Drucker, 1988; Senge, 1990; Davenport & Prusak, 1998; Srikantajah & Koening, 2000; Tang, 2011). Being knowledge the catalyst for the development of core competences, it is also one of the impellers of innovation in the organization (Chalhoub, 2012). Organizations are being pushed to create internal self-propelled processes for innovation of products and processes that keep them

ahead of their competitors (Ahuja, 2011; Yang, 2007). According to Saeida et al. (2007), organizations must stimulate creativity and support new ideas by means of the creation of a managerial environment where employees express their ideas and are ready to share their knowledge and, that the company must be open to innovations. Therefore, creation of innovation is based on initiative and the development and implementation by treating innovations and competitiveness as a function of KM (Sedziuviene & Veinhardt, 2010).

Knowledge produced innovations are understood as the creation, development, exchange and application of new ideas into products and services adapted for sale, which leads to the success of the organization, the vitality of the economy and to the progress of the company. This way, for a modern organization, which is in constant fight against the rest of the competitors and that struggle to distinguish itself in a market saturated of innovations, its difference in relation to his competitors depends mainly on the utilization of knowledge-based assets, as well as knowledge per se, the management of innovation and its integration into practice (Sedziuviene & Vveinhardt, 2010). The aptitude to develop organizational learning and KM strategies has been considered to be an effective and efficient way for successful technological innovation (Gilbert & Cordey-Hayes, 1996; Raymond & Blili, 2000; Martin & Matlay, 2003).

5. KM and EBA

The today business world is characterized by phenomena as electronic commerce (EC), globalization, highest degrees of competitiveness, rapid evolution of the new technologies, rapid change of the consumers demand, as well as changeable economic and political structures (Marr, Schiuma & Neely, 2004). In this new context, companies need to develop clearly definite strategies that give them a competitive advantage (Porter, 2001; Barney, 1991). For it, organizations have to deal which are the necessary aptitudes to obtain and support competitive advantage (Barney, 1991; Prahalad & Hamel, 1990). In this context, TI can play an important role in KBV, since IS can be used for synthetize, and improve the management of the large-scale knowledge among companies and inter-companies (Alavi & Leidner, 2001). Many organizations are trying to be competitive trough the application of IT (Martínez-expensive and Cegarra-Navarrese one, 2010). Nevertheless, there arise several e-business related problems that in turn demand the companies to generate different knowledge in order to face to the challenges and decisions in relation with EBA in the organizational activities (Chong, Ooi, Bao & Lin, 2014). E-business also have significantly re-shaped the traditional business processes for the whole chain of value from the development of products, up to the sales and management activities and the relations with internal human resources to final consumer and the supply of raw materials (Fahey et al., 2001). E-business have promised new routes for value creation and business opportunities with dynamic characteristics, rapid growth and highly competitive (Shearwater-Navarrese one and Martínez-Conesa, 2007).

E-business can be defined as a method of computerized transactions using systems of electronic communication across Internet and Intranets deprived from end to end of the company (Papazoglou & Ribbers, 2006). E-business related organizational capacities and technological innovation are two of the principal and crucial challenges for managerial success (Tornatzky & Fleischer, 1990; Veliyath & Fitzgerald, 2000). A successful EBA has been recognized as a key concept for technological innovation and investment (Damaskopoulos & Evgeniou, 2003; Jackson & Harris, 2003).

In most of previous studies there is a strong predisposition to study EBA based on the theory of diffusion and adoption of innovations of Rogers (1995), or thru technological, environmental and organizational factors derived

from the TOE model by Tornatzky and Fleischer (1990) and some others using the technology acceptance model (TAM), by Davis, Bagozzi and Warshaw (1989). Factors more commonly studied are some such as compatibility, complexity, relative advantage, tryability, observability; perceived usefulness and perceived facility of use (Chong and Ooi, 2008) in order to determine the impact that technology and the internal and external environment of the company have in the considerations of EBA (To & Ngai, 2006; Kuan & Chau, 2001; Premkumar et al., 1994; Ngai & Gunasekaran, 2004; Iacovou et al., 1995). Nevertheless, e-business with its constant change of business nature and its immense links with knowledge, has made the paradigm of KM a source of an important deliberation on its impact in the adoption of technology (Lin and Lee, 2005), therefore, KM has been included as one of the factors of EBA (Gloet & Terziovski, 2004), in spite of the fact that even if e-business provide many opportunities for SMEs, an important number of them has not capitalized these new technologies (Fillis, Johansson, & Wagner, 2004). Barriers to change are not already technological — now they are competences barriers and they will. This resistance to implement e-business technologies can be related to questions of uncertainty, confidence and lack of knowledge that disable the pace to which SMEs adopt e-business (Fillis, Johansson, & Wagner 2003). This is specially true if the executives of the SME have never used before any electronic way of communication with business purposes (Nath et al., 1998).

Nevertheless, there is an important lack of studies on the impact KM in EBA (Lin & Lee, 2005), only a few studies have been published trying to explain EBA from the KM perspective (e.g., Martínez-Caro & Cegarra-Navarro, 2010; Chong, Ooi, Bao & Lin, 2014; Lin & Lee, 2005) in spite of the fact that the barriers to the change from the traditional business operations towards e-business is every time less related to technological perspectives as the availability of suitable IS; and more dependent on a suitable KM in the company. The reason for which SMEs are reluctant to EBA is increasingly linked to the question of the lack of knowledge (Fillis et al., 2003; Wang & Lin, 2009).

Therefore, it can be said that KM supports the strategy and decision of EBA and use (Chong, Ooi, Bao & Lin, 2014), this has led some experts to affirm that knowledge has turned into one of the motivating forces more important for the success of EBA (Kuan, 2005; Choi & Reads, 2002). Nevertheless, and in spite of the fact that previous studies support the claims in which KM is important for technological innovation in the organizations (Du Plessis & Boon, 2004; Nonaka & Takeuchi, 1995), there is a lack of theoretical and empirical studies on the influence of KM practices on EBA.

6. Development of the Research Model

This work considers e-business systems in terms of technological innovation (Jackson & Harris, 2003), and examines the factors of KM (organizational learning, knowledge acquisition, knowledge storing, knowledge sharing and knowledge use and re-use) that influence EBA. Figure 1 shows the proposed theoretical research construct, it hypothesizes that several organizational learning factors (knowledge learning from an activated networks of contacts, technical training, technical experience and IT level of knowledge) as well as KM processes (knowledge acquisition — from industrial associations, competitors, clients and suppliers, public research organizations, universities and government institutions — transmission and dissemination of the knowledge-enhanced by the firm's orientation to customers and suppliers, knowledge storage and application of knowledge-use and re-use) influence the adoption and use of e-business technologies. The development of the theoretical model and the hypotheses are discussed to detail in the next paragraphs.

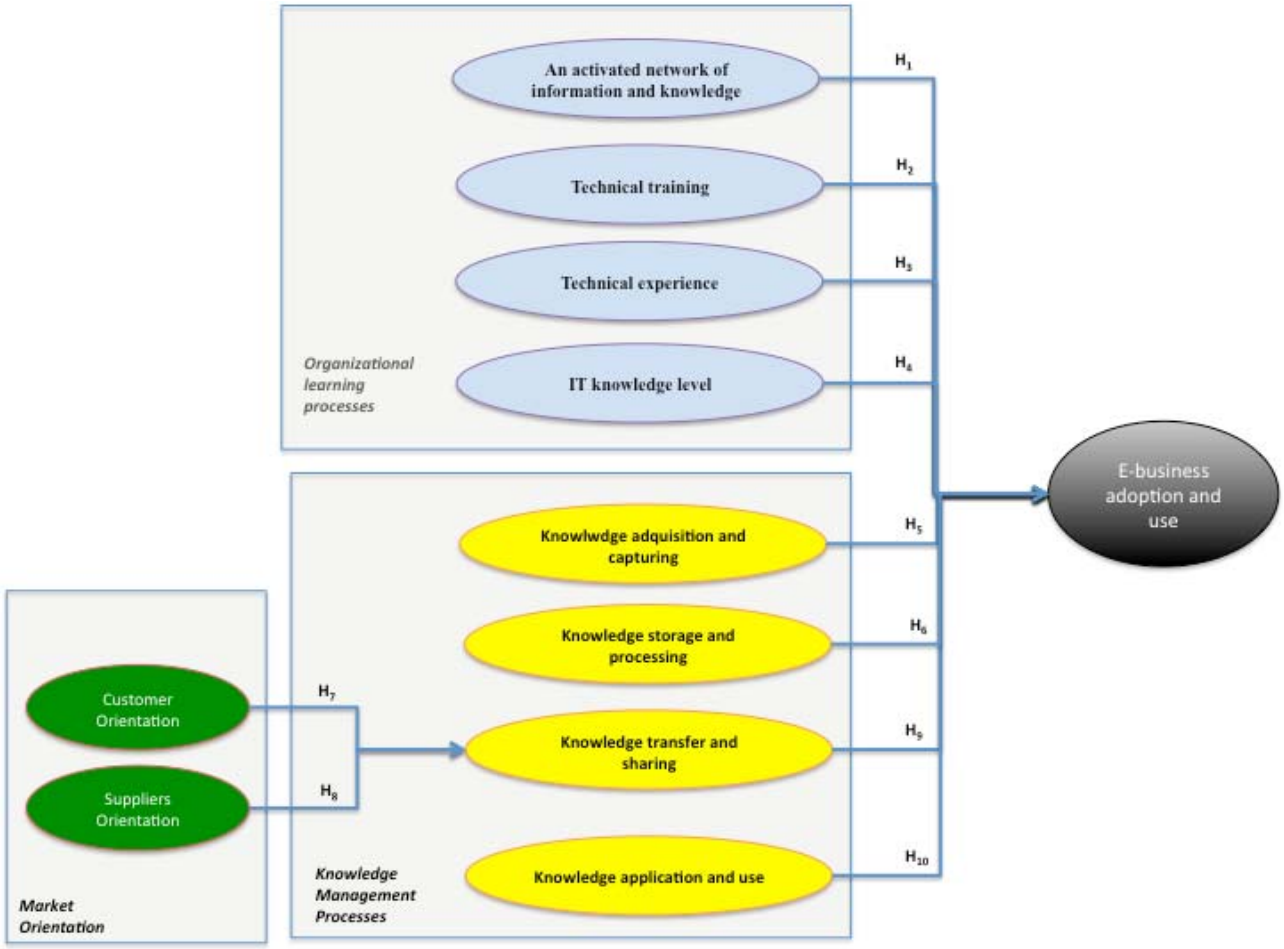

Figure 1 Proposed Research Model

6.1 Organizational Learning Factors

Kim (1998) argues that the organizational learning can be divided in two different types: conceptual and operational. On one hand, conceptual learning has to do with the thinking on why the things are like as they are or why are they done, often challenging the same nature of the existence of the prevailing conditions, procedures or conceptions, directing potentially towards new mental models and new forms of comprehension of the phenomena. Across the conceptual learning, the individuals develop cognitive maps (Huff, 1990), of the different domains in those who operate. Distinctively, operational learning refers basically to learning how to do something. It relates to learning how to complete the necessary steps to carry out a specific task. Operational learning is the link between what the individuals can do (capacity), what they want to do (motivation) and what they need to do (approach), it improves the application of the knowledge. E-business systems shape the processes of technological innovation, its successful adoption needs adjustments in the business processes, and also needs that the company modifies and dominates the technical aspects of the technology (Attewell, 1992), therefore, a successful adoption of e-business technologies in a company, needs both conceptual learning and operational learning. In this study, speaking about the factors that affect the operational learning in order to adopt e-business technologies, both types of learning are born in mind. Thus, there four factors that can be hypothesized to influence organizational learning with purpose of EBA: learning across an activated network of information, technical training, technical experience,

and the IT level of knowledge of the employees of the company.

6.1.1 An Activated Network of Learning

The firm environment and more specifically, the social network of the company, acts as a source of ideas, information and knowledge (Aldrich & Zimmer, 1986; Christensen & Peterson, 1990; Hills et al., 1997). Innovative companies use systematically his social network to generate ideas and to obtain information that allows them to recognize business enterprising opportunities (Birley, 1985; Moss Kanter, 1988; Smeltzer et al., 1991; Singh, Hills, Hybels & Lumpkin, 1999; De Koning, 1999; Singh, 2000). Moss Kanter (1988) emphasizes the importance of the contacts with those that observe the problems from different perspectives not only to be aware of needs but also to construct new ways of attending these needs to facilitate the emphasis in innovation. This can provide the company with information and knowledge over of technological innovations that are the base to take advantage of opportunities. The collaboration with other companies also provides new business ideas, collaboration can be the way of acceding to technological knowledge and in addition, an opportunity to learn new technological competences and of market insights (Tidd et al., 1997).

The ability to use external knowledge resources widens the base of resources of the company (Christensen, 1990; Anand, Glick & Manz, 2002). The modern companies every time prosecute relations more and more intensive and interactive with his clients, suppliers and partners (Raymond, 2001; McIvor et al., 2003; Simmons et al., 2007). Raymond (2001) indicates that the use of technological based initiatives (TBI's) has enabled the companies and their business partners to improve their commercial transactions and relations. Grover and Malhotra (1997) affirm that Internet based IT have become omnipresent and allow a better coordination and integration of the business partners. In a similar way, companies — including SMEs — answer to the competitive pressures adopting TBI's and related technologies (Poon & Swatman, 1997; Grover & Malhotra, 1997; Raymond, 2001). More importantly still, Chong and Pervan (2007) found that competitive pressure influences in a significant way the degree of deployment of e-business strategies in the Australian SME's. A company can be pressed into adopting e-business technologies on having obtained knowledge of consumers, partners and competitors (Raymond, 2011; Poon & Swatman, 1999; Hart & Saunders, 1998; Gatignon & Robertson, 1989; Grover & Malhotra, 1997). Al-Qirim determined in 2007 that EBA is also influenced for technology sellers, therefore, they can be considered to be an important source of IT knowledge and external experience and a significant determinant of the EBA in SME's (Thong et al., 1997). In brief, the skills of a company to use his external network as a source of ideas, information and knowledge; acts as a positive precedent for EBA. It is possible to affirm then, that the companies that rely on a activated network of information, obtain e-business related knowledge and its utility, from the information obtained of the different participants in his business network. The previous discussion allows the development of the following hypothesis:

H_1: An activated network of information and knowledge affects positively EBA in SME's

6.1.2 Technical Training

E-business technologies shape the processes of technological innovation. The successful adoption of complex technologies needs adjustments in the business processes, it also needs that the company modifies and dominates the technical aspects of the technology (Attewell, 1992). In spite of the omnipresence of the information systems (IS) in the modern places of work, every time there are more proofs that the companies do not realize completely of the organizational efficiency that can be develops thanks to e-business adoption and use, due to the low acceptance of employees of new IT (Johnson, 1997). The availability of technical knowledge and the high-level IT training have been identified as a necessary and indispensable component in the adoption of new IT (Venkatesh &

Speier, 2000; Robey et al., 2002). The availability or access to training refers to the quantity of the available education to the users or adopters of technology. Attewell (1992) holds that the learning of the technical knowledge necessary to use complex innovations is a challenge to adopt innovations. In agreement with this, the training level of the employees in the companies that use ERP systems relates positively to the success of the implementation (Bradford & Florin, 2003). Venkatesh and Speier (2000) found that availability of training correlates positively to the intention of use of technology. Training in e-business technologies can be, therefore, necessary to successful EBA. Therefore, therefore, the following hypothesis is formulated:

H_2: Technical training availability in a company affects positively EBA.

6.1.3 Technical Experience

Technical experience (TE) refers at the level of specialized technical experience of the company employees. The companies are mainly biased to adopt innovations when they have TE and therefore, the TE can increase the level of technological adoptions in a company (McGowan & Madey, 1998; Thong, 1999). Cragg and Zinatelli (1995) identified the lack of technical experience as a key factor that disables the evolution and sophistication of managerial IT. Even more, Tiessen Wright, and Turner (2001) state that technical experience facilitates the adoption of EC technologies at firm level. Besides previous knowledge, there exists an effect of previous experience in the learning and knowledge acquisition (Cohen & Levinthal, 1990; Van de Ven et al., 1999). It is possible to expect therefore, that companies that dominate the technical aspects of e-business adopt e-business systems in a more integral way than those with minor levels of technical experience. Therefore, the following hypothesis is formulated:

H3: Technical experience of a company positively affects EBA.

6.1.4 IT knowledge Level

Knowledge level (KL) refers to the familiarity of the employees with a given technology. If the employees of a company possess knowledge related to a technology in specific, it is more probable that they are capable of facing the problematic of its adoption. McGowan and Madey (1998) found that the level of knowledge on electronic data exchange (EDI) influences positively its level of managerial implementation, consistently, if the employees of a company possess knowledge related to e-business, it is more probable than the company adopt e-business technologies. Mehrtens et al. (2001) found indications of the presence of organizational members with specific IT that can support the recognition of e-business opportunities; therefore, it is possible to formulate the following hypothesis:

H_4: The IT knowledge level that a company posses, influences positively EBA.

6.2 KM Processes

KM has emerged as an important concept and it is often mentioned as a precedent to innovation (Nonaka & Takeuchi, 1995; Darroch & McNaughton, 2002). Increasingly companies are starting KM initiatives to benefit from the dynamic effects of the interactive processes. In addition, recent studies underline that, in the current context of rapid technological innovation, the companies examine the capacity of organization across the accumulation, combination and diffusion of knowledge (Grant, 1996). Thus, KM efficient processes, such as the acquisition, storage, application and shared use of knowledge, are important for the adoption of new technologies.

6.2.1 Knowledge Acquisition and Capturing

Knowledge acquisition (KA), is defined by Lin and Reads, (2005) as “the processes of business that capture knowledge”. Gilbert and Codey-Hayes (2006), define it as the initial step of the KM, and indicate that it includes the processes that manage and use the existing knowledge by the members of the company, as well as the capture

and assimilation of new knowledge. Martenson (200) argues that KA is the method that companies use to acquire the knowledge that resides in them. Drucker (1993) raises that administrative and technical innovations need of a concentrated effort and experience to recognize and to capture new knowledge. The ability of an organization to adapt and to strain in times of complexity, ambiguity and rapid change, depends on the skill of the organization supporting and preserving up to a certain point both the ancient knowledge and the new one (Egbu, Hari, & Renukappa, 2005). Even more, Darroch and McNaughton (2002) examined the relation between KM practices and the types of innovation and found that the probability of a managerial innovation to be effective increases with KA degree. The infrastructure of e-business systems involves not only EC initiatives; it also is stimulated by technical skills and KA (Moodley, 2003). Gilbert and Codey-Hayes (1996) mention that one of the factors of success in technological innovation is KA, whereas Darroch and McNaughton (2002) affirm that innovation in an organization increases as KA increases. Therefore, KA is an important managerial asset, especially in the important decisions that are based on experience and information shared informally. Consistently, e-business infrastructure not only incorporates technological initiatives, but acquisition of skills and knowledge as the principal driving forces of the adoption (Lin & Lee, 2005). Therefore, the association between KA entrepreneurship, can be expected to relate positively to EBA:

H_5: The processes of KA influence positively EBA.

6.2.2 Knowledge Storage

Harveston (2005), through a series of case studies and qualitative interviews, explored that Knowledge Management Systems (KMS) can lower costs tremendously by increasing communication and eliminating unnecessary steps in the SMEs. Establishing internal KMS for organizational memory created opportunities to minimize knowledge isolation in functional departments and created a greater base for tacit learning to be leveraged. Menkhoff et al. (2004) suggested that as economies and businesses shifted towards a new world configuration of digital information and knowledge-based work, SME owners need to take on this challenge and find out how KMS solutions can assist them. The findings described that by locating and capturing innovative ideas and other types of strategically important KM practices used by technicians to solve maintenance problems, SMEs can improve innovativeness, service quality and response time. The documentation of “war stories”, yellow pages and data mining are useful KMS tools for locating, capturing and storage knowledge. Feng et al. (2004) analyzed the impact of KMS on the firms that adopted KS with the data extracted from the Compustat. They discussed that KS improves organizational performance by significantly reducing administrative costs and increasing productivity. Therefore, the following hypothesis can be formulated:

H_6: The processes of KS influence positively EBA.

6.2.3 Orientation to Customers and Suppliers

Effective innovation stems from an active conscience about the changeable needs of consumers and sometimes of direct demands or solutions proposed by them (Moss Kanter, 1988; Rothwell, 1992; Tidd, Bessant & Pavitt, 1997). Shane (2000) demonstrated that the previous knowledge of markets, the ways of serving these markets and of attending to the problems of consumers promote the discovery of opportunities. To focus on markets and consumers increases the probability of visualizing enterprising opportunities (Christensen & Peterson, 1990; Hills & Shrader, 1998; Singh, 2000; Of Koning & Brown, 2001). The orientation to markets is defined commonly as “the business culture that creates in a more effective and efficient form, top value for the consumers” (Narver & Slater, 1990, p. 20). Narver and Slater (1990) divide the orientation to markets in three sub-constructs: Orientation to consumers, orientation to competitors and inter-functional coordination. The

orientation consumers and competitors include specifically all the activities involved in acquiring information and knowledge brings about of the buyers and the competitors on the market (Narver & Slater, 1990).

Literature indicates that KM is better when relies on more varied interpretations proceeding from the different individuals that form part of the firm. For example, Huber (1991) affirms that one of the principal factors that influence the achievement of generating multiple interpretations is the collaboration with other organizations. Taking a count Huber's contributions, it is possible to raise that the orientation of a company to his suppliers (SO) and the orientation to his consumers (CO) becomes an ideal platform to learn and explore new possibilities, since two or more individuals are working as a whole with different resources and capacities. Langerak (2003) affirms that resources are scanty in SMEs and for it, "to have a KM manager does not justify itself in the majority of them. Thus, in most of the SMEs, is more probable that knowledge is obtained from secondary information (for example, business magazines, conferences or congresses) or across personal contacts". Dewhurst and Cegarra (2004) suggest that due to this situation of shortage of resources and that derived of that any practice to acquire knowledge will be generally costlier that to stimulate the contacts with suppliers and consumers, it is more probable that the source of information and knowledge on technological innovation, should come from these. Koh and Maguire (2004), argue that one of the principal impellers of the emergent trend in SMEs to implement e-business technologies is the pressure of his consumers. Carmichael et al. (2000), suggest that a key impeller in the SME to innovate is the feedback and exigency of the consumers. Kula and Tatoglu (2003) found that the majority of SME's innovate only when they feel pressed for his consumers. The communication and collaboration with clients and suppliers provides a 'face-to-face' interaction of such form that facilitates the exchange of knowledge. Nevertheless, in this stage, knowledge is individual more than social (Soothsayer, 1991), and tacit more than explicit (Nonaka, 1994). Therefore, it is necessary that this knowledge is absorbed in the structures of organizational memory before it turns into a component of the "dominant design" (Cegarra-Navarro & Martínez-Conesa, 2007). A disadvantage exists with the previous arguments in the sense that the information provided by consumers or suppliers is a thing, and the knowledge that uses the company, is another, that is to say, the knowledge created by the area of sales or the area of supplies, is not formulated or created by the direction of the company, but it is created constant across the consumers and lost as the employees leave the company, the workgroups are dissolved or diminish the applications, therefore, in order that the knowledge proceeding from the consumers and suppliers of the company is applied, it is needed "to transmit the knowledge" to the rest of the members of the company. In these companies, it has been demonstrated that to satisfy the expectations of suppliers by means of the delivery of a major level of electronic services and a better communication, is one of the impellers of adoption of IT such as the Internet based commerce (Caldeira & Ward, 2003; Mehrtens et al., 2001; Riemenschneider et al., 2003). The pressure exercised by suppliers and consumers towards e-business use also was verified as a determinant of EBA by Barua et al. (2004), and Oliveira and Martins (2010). From the point of view of this work, then, in order that a company applies the knowledge that obtains of his suppliers and consumers there is needed that the company works cooperatively with other organizations for the development of new products and/or managerial processes, to better satisfy his consumers or to create market innovations.

The CO and the SO focus in determining the consumers and suppliers, the business processes and relevant, necessary domains of knowledge to develop successful business activities and to acquire or to generate the needed knowledge, monitoring the activities of suppliers and consumers in a KMS. Under this premise, the sellers and buyers or the persons that are "windows of contact" acquire knowledge based on their direct experiences and on their observations, which store in their reports like knowledge, beliefs and values (Selnes & Sallis, 2003).

Davenport et al. (2001) call this knowledge 'human information or human knowledge' due to the fact that it is captured and used principally by employees who interact with consumers and suppliers or observing and interpreting the behavior of their colleagues. From the previous discussion, two hypotheses can be formulated as follows:

H_7: SO improves KT.

H_8: CO improves KT.

6.2.4 Transmission and Dissemination of Knowledge

Knowledge transmission (KT), is defined by Lin and Lee (2005) as the processes of business that distribute knowledge among the individuals who take part in the activities of these processes. Egbu et al. (2005), define the dissemination of the knowledge (KD) as the process of sharing and transferring knowledge. Therefore, the approach of the KD has to do with KT processes that take part in these business specific processes (Molapo, 2007). According to Almond (2001), the KD is the form in which knowledge passes of and towards the individuals inside his place of work. Chua (2003, p. 118), indicates that "KT is the process by means of which the individuals collective and interactively refine a thought, an idea or a suggestion in the light of the experience". Among the principal worries about are the lack of skills of communication and the rapid change of IT Egbu et al. (2005).

Sinkula Baker, and Noordewier (1997), propose that the impartiality, it is to say, the disposition to consider openly ideas and opinions that are different of ours is associated with the concept of learning across which the executives favour the distribution of knowledge by means of the social processes among groups and individuals. The result of this outsourcing and process combination turns into 'explicit shared knowledge' stored in the organizational memory. The aim of this social learning is that all the members of the organization are aware of wherefrom it is that reside complementary useful skills (for example, who does know that? who can help with this? who can take advantage of this new information?) (Soothsayer, 1991). Lin and Lee (2005) affirms that one of the factors that improve the performance of e-business is KT. Even more, Darroch and McNaughton's (2002), studied the relation between KM practices and the types of innovation, and found that KD and innovation have a direct relation among them. Since the adoptions of technology often generate innovations, it is reasonable to affirm that the KD will have an impact in EBA (Carneino, 2000). Damodaran and Olpher (2000) emphasize that a culture of KT is the principal organizational condition for successful KM and his development. Caloghirou Kastelli, and Tsakanicas (2004), found by means of a survey that the opening towards the exchange of knowledge is important to improve the innovative performance. Therefore, the processes of KT and KD are expected to be associated positively with EBA, for what it is possible to formulate the following hypothesis:

H_9: The processes of transmission and dissemination of knowledge influence positively the process of EBA.

6.2.5 Knowledge Application and Use

Lin and Lee (2005), define knowledge application (KAp) as "the business processes by means of which the effective storage and the mechanisms of recovery, allow to a company to accede of easy form to the knowledge", whereas Bhatt (2001) defines it as "to do that knowledge be more effective in order to obtain more value of the above mentioned knowledge". The latter definition incorporates the integration of the knowledge generated in the levels of acquisition (Cagarra-Navarro & Martinez-Conesa, 2007) and the knowledge is at the time applied in the routine business activities for the performance improvement. The principal elements of the development of technological capacities consist of the transfer, transmission and practical application of knowledge from a technological perspective (Zahra Neubaum, & Larranetta 2007; Ho & Kuo, 2013). Cagarra-Navarro and

Martinez-Conesa (2007) found that the companies that are more inclined to implement e-business systems are those that constantly improve the organizational KAp, which is coherent with the concept that KAp can be a facilitator to assure a successful technological innovation (Zahra Neubaum, & Larranetta 2007; Ho & Kuo, 2013). Consequently, companies that have major probability of adopting new technologies are those that constantly improve the application of his organizational knowledge, including the Internet based business opportunities. From the perspective of technological innovation, it is possible to indicate then that the transfer of knowledge, the integration of knowledge and the practical application of knowledge are the principal elements for the development of technological capacities (Gilbert y Cordey-Hayes, 1996; Sveiby, 1997; Johannessen, Olsen, & Olaisen, 1999) and that firms that stimulate and improve the organizational application of knowledge are more likely to adopt new IT, therefore, the following hypothesis can be proposed:

H_{10}: KAP positively influences EBA.

7. Conclusions

This paper developed a theoretical model of research based on organizational capacities and the existing literature on learning organizational and KM to examine the influence of four factors of organizational learning and of four KM processes in the adoption and use of e-business technologies. It proposes that the adoption and use of e-business technologies is influenced by the following factors: 1) AN activated network of information and knowledge, 2) Technical training, 3) Technical experience, 4) IT knowledge level, 5) Knowledge acquisition and capturing, 6) Knowledge storage and processing, 7) Knowledge transmission and sharing, and 8) Knowledge application. The study examined in addition KM processes as important precedents of the technological innovation.

The results of this study have implications for the managerial adoption of e-business systems. From this dissertation it can be achieved a better understanding of the importance of the development of strategies of OL and KM in SMEs and his utility in the adoption of e-business technologies. The study has also implications for the researchers; across the analysis of the literature interesting questions have arisen in this study that can be born in mind in future investigations, for example, researchers might try to reach a better comprehension of the impacts in the level of EBA derived from the factors investigated in this study related to the processes of OL and KM by means of other such techniques of research — executives structured interviews and other qualitative approaches.

Among the most important limitations of the study, it stands out its purely theoretical nature. There is needed an empirical research that validates the offers developed in the theoretical construct.

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