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Analyzing ICT adoption and use effects on knowledge creation: An empirical investigation in SMEs

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ABSTRACT

This paper investigates the influence of the adoption and use of information and communication technology (ICT) on organizational learning (OL). The focus is on knowledge, creation, as an articulated construct for the OL concept, and the SECI (Socialization, Externalization, Combination and Internalization) model is used as a reference for knowledge, creation. ICT use is seen here as consisting of three different orientations: informative, communicative and workflow. The results, based on a sample of around 300 Spanish small- and, medium-sized enterprises (SMEs), indicate that ICT has a significant positive influence on the, four processes for creating knowledge. ICT oriented to communication and workflow is found, to produce a significant positive impact on knowledge creation processes, except for, socialization process, while ICT use for information does not influence any of the processes for, creating knowledge and OL.

1. Introduction

Organizational learning (OL) consists of knowledge acquisition, information distribution, information interpretation, and organizational memory (Huber, 1991), and it should be concerned with new knowledge creation (Crossan, Lane, & White, 1999; López Saez, Martín de Castro, & Navas López, 2008). OL is depicted as having a great potential to affect organizational outcomes, such as organizational control and intelligence, competitive advantage, and the exploitation of knowledge and technology (Templeton, Lewis, & Snyder, 2002). By focusing on knowledge creation, considered as an element of OL, Nonaka and co-workers have developed the SECI model, a well-accepted framework which encompasses the process of knowledge creation through conversion from tacit to explicit knowledge. It consists of four processes: Socialization, Externalization, Combination, and Internalization (Nonaka & Takeuchi, 1995). Through the conversion process, tacit and explicit knowledge expand in both quality and quantity (Nonaka, Toyama, & Nagata, 2000), thus enhancing organizational performance. Organizations are designing and developing information and communication technologies (ICTs) which offer opportunities for enhancing strategic learning, even at distance (Thomas, Sussman, & Henderson, 2001). Research has shown that firms overcome learning traps by employing emerging, novel and pioneering technologies, but how learning is undertaken through these technologies is unknown (Small & Irvine, 2006). In addition, earlier studies on OL have expressed concerns about the lack of empirical research (Dawes, Lee, & Midgley, 2007; Vince, Sutcliffe, & Olivera, 2002) and have neglected small- and medium-sized enterprises (SMEs) when analyzing OL (Chaston, Badger, & Sadler-Smith, 1999). Consequently, this paper investigates the effect of ICT adoption and ICT use on OL in SMEs in order to address these issues.

Existing research (Appiah-Adu & Sing, 1998; Berry, 1998; Bhagwat & Sharma, 2007; Burns & Dewhurst, 1996; Ghobadian & Gallear, 1997; Marri, Gunasekaran, & Grieve, 1998) suggests that SMEs may differ from larger firms in a number of characteristics: fewer financial, technological and personnel resources; personalized management, with little devolution of authority; informal and flexible strategies; flat and flexible structures; reactive and fire fighting mentality. SMEs are of great importance for economic growth, employment and wealth creation in both large and small economies. For example, in Europe, SMEs represent around 99% of the total number of firms (European Commission, 2004). The limited amount of research with regard to ICT adoption in SMEs has been attributed to the fact that SMEs started to use ICTs relatively recently (Caldeira & Ward, 2002).

ICT investment in SMEs, especially that related to Internet technologies, continues to grow because these technologies are being applied more and more to conducting business activities within the firm's boundaries and with external business agents—customers, suppliers, business partners, etc. (Soto-Acosta & Meroño-Cerdan, 2008). As a result, researchers and practitioners face pressure to answer how ICT has to be implemented in SMEs to outperform traditional work practices. In this sense, learning and unlearning are important for change and innovation in organizations (Becker,

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