

Chapter 9

Critical Factors of ERP Adoption for Small- and Medium- Sized Enterprises: An Empirical Study

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ABSTRACT

Small and Medium-sized Enterprises (SMEs) play a vital and pervasive role in the current development of Taiwan's economy. Recently, the application of Enterprise Resource Planning (ERP) systems have enabled large enterprises to have direct contact with their clients via e-commerce technology, which has led to even fiercer competition among the SMEs. This study develops and tests a theoretical model including critical factors which influence ERP adoption in Taiwan's SMEs. Specifically, four dimensions, including CEO characteristics, innovative technology characteristics, organizational characteristics, and environmental characteristics, are empirically examined. The results of a mail survey indicate that the CEO's attitude towards information technology (IT) adoption, the CEO's IT knowledge, the employees' IT skills, business size, competitive pressure, cost, complexity, and compatibility are all important determinants in ERP adoption for SMEs. The authors' results are compared with research on IT adoption in SMEs based in Singapore and the United States, while implications of the results are also discussed.

INTRODUCTION

In recent years, the evolution and application of information technology (IT) have enabled large enterprises to gain the capability of contacting clients directly via e-Commerce technology. In order to cooperate with large firms, SMEs need to incorporate information systems into their operations. Consequently, SMEs should improve their organizational structure and operational business processes by constantly strengthening and aligning their business partners within fast changing markets, while also being keenly responsive to external challenges (Iacovou et al., 1995; Thong & Yap, 1995).

In order to cope with these aforementioned future challenges, SMEs must aggressively adopt newer market ideas, be sensitive to advanced technology, equip themselves with better, innovative solutions to maintain their core competencies, values and norms, and focus on future research and development issues (Adams et al., 1992; Ballantine et al., 1998; Grandon, 2004; Thong, 2001). SMEs not only face a highly competitive business environment, but they are also restricted by such factors as existing financial constraints, lack of access to expert knowledge, and an exposure to external pressures (Chwelos et al., 2001; Houben et al., 1999; Welsh & White, 1981). SMEs usually lack sufficient experience in the management of IT and information system professionals (Cragg & King, 1993; Iacovou et al., 1995). Even the SMEs that are willing to recruit experienced information system professionals have trouble retaining them on a full time basis (Gable, 1991). Furthermore, although factors such as technology, time, and human resources may not be major constraints for large organizations, this remain the main resource issue in SMEs implementation and management of their business plans and development. As a result, organizational theories that apply to large enterprises are not likely to be applicable to SMEs'. Prior literature also supports that influencing factors for large enterprises to adopt new information

systems may not be applicable to SMEs (Grandon, 2004; Raymond, 1985; Riemenschneider et al., 2003; Thong, 2001; Yap et al., 1992).

Enterprise Resource Planning (ERP) is an information systems technology and concept that was developed and initiated in the 1990's. ERP systems have proven to be useful solutions in integrating business processes and resources with the enterprises' operational and management strategies (Amoako-Gyampah & Salam, 2004; Davenport, 1998; Holsapple & Sena, 2005; Klaus, Rosemann, & Gable, 2000; Markus et al., 2000; Sarker & Lee, 2003). Several potential tangible and intangible benefits of applying ERP technology to businesses include such items as: improving organizational performance; understanding a range of functionalities not catered to in the existing system; increasing returns from the implemented ERP systems; streamlining an organization's internal processes; lowering costs for developing an ERP that more accurately reflects business needs; improved capability to react to a changing environment; and improved customer satisfaction related to services rendered or products manufactured (Chang & Gable, 2002; Davenport, 2000; Li, 1999; Rajagopal, 2002).

Although many prior studies focused on ERP, few have examined the effects of ERP adoption on SMEs (Bingi et al., 1999; Chen & William, 1998; Grandon, 2004; Holland & Light, 1999; Levy et al., 1999; Mabert et al., 2003; Rajagopal, 2002; Sarker & Lee, 2003; Scott & Kaindl, 2000). There are several existing studies focused on organizational characteristic for ERP adoption within SME such as the studies of Chan (1999); Kagan et al. (1990); Lang et al. (1997); Levy and Powell (2000); and Zinatelli et al. (1996). On the other hand, some characteristics about SMEs mentioned by previous studies include only CEO characteristics, Environmental characteristics and Innovation characteristics (i.e., SMEs were not only face a highly competitive business environment). In addition, they are also restricted by not studying such factors as existing financial

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