

Empirical Study of E-Commerce Adoption in SMEs in Thailand

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INTRODUCTION

It was predicted that in 2004, e-commerce would generate worldwide revenue as high as \$6.9 trillion, and the number of Internet users would grow as high as 765 million users in 2005 (CommerceNet, 2003). Though about 40% of on-line spending originates in the United States, this proportion is predicted to fall to about 38% by 2006, due to increased online spending of residents in Asia and Western Europe (Virgoroso, 2002). In addition, it was expected that online buying in Asia will grow about 89% in 2002 (Virgoroso, 2002), and the Asia Pacific will be the second most profitable, with a value of \$1.6 trillion (CommerceNet, 2003).

As one of the fast growing countries in Asia, Thailand has initiated and implemented a series of national plans and activities to promote diffusion of e-commerce in both public and private sectors. Despite optimism towards e-commerce, evidence from a recent survey by the EIU (Economic Intelligence Unit) suggested that Thailand's adoption rate is still slow. According to the 2002 EIU e-readiness survey, Thailand was ranked 46 from the 60 main economies of the world (EIU, 2002). It is therefore important to understand factors affecting a firm's decision on e-commerce adoption. A deeper and clearer understanding on such issues would help design appropriate e-commerce models to target consumers in these economies and also to formulate appropriate policies to accelerate e-commerce diffusion in other countries.

This article examines the factors influencing e-commerce adoption decisions in small and medium enterprises (SMEs) in Thailand. We classify firms into three main groups—*adopters*, *prospectors*, and *laggards*—based on their extent of e-commerce innovativeness (Rogers, 1995), defined as the extent to which an organization is relatively earlier to adopt e-commerce than others.

To begin, adopters are firms that have already implemented and used e-commerce in their business activities. These firms are creative and innovative in applying leading-edge technologies, such as e-commerce, compared with their competitors. Second, prospectors are firms that

have not yet implemented e-commerce, but they have a specific plan in the near future to adopt and implement e-commerce. Prospectors tend to avoid the immediate application of leading-edge technologies; however, after a certain period of time, they readily adopt innovations that have been proven effective. Finally, laggards are firms that have not implemented e-commerce and have no plan or intention to adopt e-commerce in the near future. Laggards typically are slow in adopting new innovation; however, they may decide to adopt the technologies when forced by business competition.

Most of the IT innovation studies have been conducted in the US. However, Asian firms are different from U.S. firms in many respects, such as geographic, political, and cultural aspects. The research findings from this study can help in determining whether the organizational innovation theory can be generalized across other settings, particularly in Asian settings.

FACTORS INFLUENCING E-COMMERCE ADOPTION

Organizational innovation was adopted as a theoretical foundation for this study. Organizational innovation can be defined as the development and implementation of ideas, systems, products, or technologies that are new to the organization adopting it (Rogers, 1995). Innovations are means of changing an organization, either as a response to changes in the external environment or as a preemptive action to influence the environment. The adoption of innovation is a process that includes the generation, development, and implementation of new ideas or behaviors (Rogers, 1995). Innovations can be categorized by a broad range of types, including new products or services, new process technologies, new organizational structures or administrative systems, or new plans or programming pertaining to organizational members (Poutsma, Van Uxem & Walravens, 1987). Adoption of e-commerce, hence, can be regarded as one form of innovation adoption.

The innovation literature has identified various groups of variables that are possible determinants of organizational adoption of an innovation (Fichman & Kemerer, 1997; Kimberly & Evanisko, 1981; Tornatzky & Fleischer, 1990; Chau & Jim, 2002). Based on a synthesis of the organizational innovation literature, Kwon and Zmud (1987) identified five sets of factors that may influence IT innovation. These sets include user characteristics, task characteristics, innovation characteristics, organizational characteristics, and environmental characteristics. Kimberly and Evanisko (1981) proposed three clusters of predictors for innovation adoption: characteristics of organization, characteristics of leader, and characteristics of environment.

Recently a number of IT innovation studies (e.g., Boynton, Zmud & Jacobs, 1994; Tornatzky & Fleischer, 1990) have adopted an emerging theory from the strategic management literature—absorptive capacity (Cohen & Levinthal, 1990)—to explain a firm's abilities in adopting and assimilating an innovation. Boynton et al. (1994), for example, argued that a firm's ability to effectively use IT is influenced by the development of IT-related knowledge and processes that bind them together the firm's IT managers and business managers. They pointed to the organizational climate as the key factor influencing the ability of firms to absorb new knowledge and technology. Fichman and Kemerer (1997) found that organizations are more likely to initiate and sustain the assimilation of software process innovations when they have a more extensive existing knowledge in areas related to the focal innovation. Table 1 summarizes factors potentially influencing a firm's decision in adopting information technology.

Table 1. Factors influencing information technology adoption

Organization Factors
<ul style="list-style-type: none"> • Organization Size • Organization Readiness • Employee IT Knowledge
Leadership Factors
<ul style="list-style-type: none"> • Top Management's IT Knowledge • Top Management's Innovativeness • Top Management Support
Technology Factors
<ul style="list-style-type: none"> • Relative Advantage • Compatibility • Complexity
External Factors
<ul style="list-style-type: none"> • Environment Uncertainty • Information Intensity

Drawing from organizational innovation literature, we identify and test six research variables, representing three major groups, *organizational factors*, *technology factors*, and *external factors*, potentially influencing a firm's decision in e-commerce adoption. First, organizational factors have been the most widely used and tested as the key determinants of innovation (Grover & Goslar, 1993; Thong, 1999). In this study, we focus on three sets of variables: structural variable (size), process variable (top management support for e-commerce), and IT context variables (existence of IT department). Size is one of the most widely investigated variables for innovation adoption. Large firms are more likely to adopt innovation since they are capable of absorbing the risk associated with innovation, and have sufficient resources and infrastructure to facilitate the implementation of innovation (Fichman & Kemerer, 1997). Process factors have also frequently been adopted as a key determinant of IT-related innovation adoption, especially the roles of top management. The IT innovation literature generally reported a positive effect of senior management support on IT-related innovation (Orlikowski, 1993; Rai & Patnayakuni, 1996). The common rationales provided include influencing the allocation of slack resources, and generating enthusiasm and commitment toward changes among organizational members. Finally, evidence from the innovation literature recently suggests that the role of a firm's ability to absorb new knowledge related to innovation can play an important role in innovation adoption (Cohen & Levinthal, 1990). SMEs that are familiar with IT skills and knowledge might find it easier to acquire additional knowledge necessary for adopting e-commerce. Hence, it is conceivable that the existence of IT departments in SMEs could promote e-commerce adoption.

The second group of variables is technology factors. Specific factors related to innovation characteristics are frequently used as a key determinant of innovation adoption intention. This study investigates the effects of two innovation characteristics: perceived compatibility and perceived benefits. Different organizations may face different innovation opportunities. Whether these opportunities can be exploited depends on the degree of match between the innovation's characteristics and the infrastructure currently available in the organization (Rogers, 1995). In addition, not all innovations are relevant to an organization. The degree of relevance depends on the potential benefits organizations received.

The third group of variables is an external factor. Past studies have stressed the importance of environments. When organizations face a complex and rapidly changing environment, innovation is both necessary and justified (Pfeffer & Leblebici, 1977). Environmental factors, especially market factors (i.e., competitiveness), cannot be controlled by organizations; rather, they affect the way

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