



Critical Factors Classification for Firm Adoption of E-Commerce

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ABSTRACT

The exponential explosion of Internet usage as a business environment (e-commerce) is dramatically changing the way businesses and individuals do business. Recently, the move of e-commerce to the forefront of information technology priorities has resulted in firms re-inventing themselves. This leads to how critical it is to understand the factors that encourage/deter e-commerce adoption by businesses. This study attempts to explore business adoption of e-commerce with the objective of categorization and classification of the published critical success/failure factors of e-commerce adoption. The classification and the related literature review offer implications for e-commerce adopters and for future researcher.

INTRODUCTION

The global exponential explosion of Internet usage as a business environment (e-commerce) is dramatically changing the way firms structure their strategies and business processes. The proliferation of e-commerce creates new challenges and opportunities for firms. This is why it becomes very useful to identify and categorize the factors affecting e-commerce adoption in order to determine the reasons why firms succeed or fail in the adoption process. This study surveys and categorizes the critical factors of e-commerce adoption by firms. The objective is to identify the major critical success/failure factors available in the e-commerce literature body. The results may provide e-commerce adopters and future researchers with implications.

As the e-commerce definitions given by various sources differ significantly, it is important to adopt a clear and consistent definition of e-commerce that can be used across the surveyed research studies. The adopted definition is provided by Kalakota & Whinston, (1996) and extended by Turban, King, Lee, Warkentin, & Chung, (2002). Kalakota & Whinston, (1996) define e-commerce from the following perspectives:

- *From a communication perspective*, e-commerce is the delivery of goods, services, information, or payments over computer networks or by any other electronic means.
- *From a business process perspective*, e-commerce is the application of technology toward the automation of business transactions and work flow.
- *From a service perspective*, e-commerce is a tool that addresses the desire of firms, consumers, and management to cut service costs while improving the quality of goods and increasing the speed of service delivery.
- *From an online perspective*, e-commerce provides capability of buying and selling products and information on the Internet and other online service.

Turban et al., (2002) added the following:

- *From a collaboration perspective*, e-commerce is the framework for inter- and intra-organizational collaboration.
- *From a community perspective*, e-commerce provides a gathering place for community members, to learn, transact, and collaborate.

Before embarking on this study it is important to understand what is the meaning of critical factor. Critical success/failure factor term appeared in the literature in the 80s when there was a concern about why some organizations seemed to be more successful than others, and research was carried out to investigate the success/failure (Ingram, Biermann, Cannon, Neil, & Waddle, 2000). Critical success factors are "those things that must be done if a company is to be successful" (Freund, 1988). Critical factors should be few in number, measurable and controllable.

This paper is organized as follows. First, the published factors affecting the firms' adoption of e-commerce are reviewed. Second, a new factor categorization is proposed. Concluding remarks and future research are introduced in the last section.

LITERATURE REVIEW

Based on information system diffusion circuit proposed by Swanson, (1994), the adoption factors can be classified into two categories: internal and external. The external factors represent the external push force for the adoption and the internal represents the internal pull force to the adoption. Sohn & Wang, (1998) adopted Swanson's categorization and considered several factors within each category. They considered 5 internal factors namely inclination toward new technology, top management support, existence of champion, absorptive capacity and cost incentive. Within the external factors category, they included three factors: institutional support, competitor's move, and customer pressure.

Exploring barriers to e-commerce adoption, Hsiao, (2001); Iacovou, Benbasat, & Dexter, (1995); Premkumar & Ramamurthy, (1995); and Kumar & Crook, (1999) concentrated on internal technological factors and organizational (both inter- and intra-organizational) factors. Riemenschneider, Harison, & Mykytyn Jr., (2002) used business anticipated satisfaction, social approval, and expected difficulty as three factors influencing the intention of businesses to adopt e-commerce. Ranganathan, Teo, Dhaliwal, Ang, and Hyde, (2001) in their cross-cultural research showed that the factors affecting e-commerce adoption by firms can be grouped into 6 categories: top management related factors, organizational factors, firm strategy related factors, project management factors, valuation factors, Internet IT environmental factors, collaboration factors, external IT environmental factors, and external business environmental factors.

Min & Galle, (1998) identified mainly three strategic factors that influence successful adoption of e-commerce namely, environmental factors (laws and government regulations) organization characteristics (organization size) and technological factors (security). In an attempt to identify critical success factors in e-commerce adoption, Godenhielm, (1999) interviewed 100 European firms. The interviews revealed 8 factors that can be grouped in two categories. the first is organizational factors (specifications of the adoption project, funding appropriateness, staffing, managerial support, existence of strategy) and the second category is environmental factors (competition, development partner, brand consistency). Ryan, Abitia, & Windsow, (2000); and Truong &

Rao, (2003) provided a description of factors influencing the adoption of knowledge management technologies in the US and categorized them as organizational, technological, and environmental. Tabor, (2000) analyzed and studied the strategy and firm characteristics related to e-commerce adoption. Thatcher & Foster, (2003) studied the effect of cultural factors on the factors affecting e-commerce adoption decisions in Taiwan. In this study the factors affecting e-commerce adoption have been classified as organizational and extra-organizational (industrial, governmental and national culture)

Local and global Competition pressure has been identified as an important determinant of e-commerce adoption by several researchers (i.e., Kraemer, Gibbs, & Dedrick, 2002; Dasgupta, Agrawal, Ioannidis, & Gopalakrishnan, 1999; Grover, 1993; Steinfield & Klein, 1999; Zhu, Kraemer, & Xu,). Chwelos, Benbasat, and Dexter, (2001) tested an Electronic Data Interchange (EDI) adoption model in which the factors had been classified to external pressure (competitive pressure, dependence on trading partner and industry pressure) and readiness (financial, information technology and trading partner readiness).

Courtney & Fintz, (2001) stated that the factors that affect e-commerce adoption are useful in determining the reason why firms are at a certain level and categorized these factors as management and organization's characteristics. Both categories are internal factors. In an extension to this work, Cloete, Courtney, & Fintz, (2002) added a third category and called it contextual characteristics. van Akkeren & Cavaye, (1999) grouped the factors affecting e-commerce adoption by small businesses in Australia into two categories: manager characteristics and firm characteristics.

In the next section, a classification and a categorization of the reviewed factors affecting firms' adoption of e-commerce is presented.

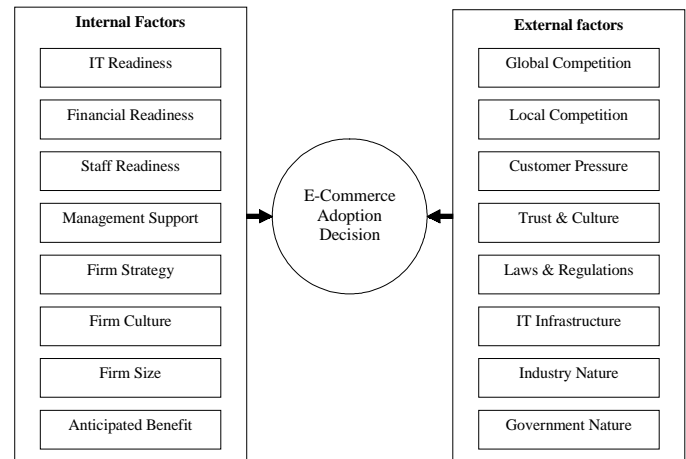
E-COMMERCE ADOPTION FACTORS CATEGORIZATION

Based on the literature review presented in the previous section, a classification framework is proposed and shown in Figure 1. The factors affecting e-commerce adoption decisions by firms are classified to two major categories: internal and external. Internal factors are within the firm while external factors are mainly environmental. Internal factors are divided further to subcategories.

The literature revealed several factor categories that fit within the internal factors group, see Figure 1. The first is information technology (IT) readiness refers to the level of IT usage within the firm. This category includes information and network security, system integration, data conversion, hardware and software compatibility, adequacy of the firm IT infrastructure and migration from legacy systems (Teo, Tan, & Wei, 1995; Sohn & Wang, ; Hsiao, 2001; Grover, 1993). The second internal factors category refers to the firm's financial readiness. Financial readiness is reflected by the top management willingness to fund an e-commerce adoption project. The major cost of e-commerce adoption is the cost of educating and training management and employees to use e-commerce (Teo et al., 1995). Another concern of the top management is the loss in productivity due to abuse of IT (such as Internet). Staff readiness factor category refers to the IT and e-commerce literacy level inside the firm.

Management support is another important internal factor category. This category represents the extent to which the top management recognizes the importance of e-commerce adoption. This recognition is reflected on the support and leadership of top management executives in e-commerce adoption process. This factor category has been identified as a key recurring internal factor that is critical to the effectiveness of e-commerce adoption initiatives (van Akkeren & Cavaye, 1999; Grover, 1993; Thong & Yap, 1995). The existence of a firm strategy has been proven to be critical to the success of most of the e-commerce adoption projects (Godenhillem, 1999; Tabor, 2000). Firm internal culture refers to the collaboration level and style among the different managerial levels and team spirit and dedication to the business processes. Firm size is one of the determinants of e-commerce adoption decisions. Tan & Teo, (2000) found that small firm size is one of the main reasons for not adopting e-commerce. Larger firms have more resources and infrastructure to facilitate implementation of e-

Figure 1. Factor Categories of E-Commerce Adoption Decision



commerce adoption projects. The anticipated financial and managerial benefits are important factors affecting the adoption decisions.

Several external factor categories have been considered in the literature. Figure 1 shows 8 external factor categories. The first two categories include the pressure exerted by competitors on a firm. Teo et al. (1995); Grover (1993); Truong and Rao (2003); and Thong and Yap (1995) argued that competitive intensity increases the need for e-commerce adoption by firms. The competition leads to environmental uncertainty and increases the need and rate of adoption. Allen, Colligan, Finnie, and Kern (2000) emphasized the importance of trust in maintaining productive adoption of e-commerce. Culture has been considered as a critical factor affecting e-commerce adoption (Ranganathan et al., 2001; Hsiao, 2001). Customer pressure on firms to adopt e-commerce is also considered as an important category. The industry to which the firm belongs affect the adoption decision. Government nature is among the most important factor groups affecting e-commerce adoption. The governments need to build knowledge and set standards. Policies and regulations are also important factors at the local and global stages.

CONCLUSION AND FUTURE RESEARCH

A literature survey of the factors affecting e-commerce adoption decisions was undertaken. The objective of this literature review was to identify a categorization scheme of the identified factors. The categorization resulted in two main categories: internal and external. Both categories were divided further to 8 subcategories each. The categorization presented in this paper can be used in the following future research works:

- The development of an extensive E-Commerce Adoption research Model (ECADM) that can be used to specify the criticality of each factor category to the adoption initiative.
- This categorization can be developed for the customer acceptance of e-commerce.
- Another research model can be developed to identify the critical factors affecting the acceptance of e-commerce by customers.

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