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# Receptivity of Singapore's SMEs to electronic commerce adoption

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## Abstract

This study surveys the receptivity of Singaporean small and medium-sized enterprises (SMEs) to the adoption of electronic commerce. Utilising a portion of Rogers' model of innovation diffusion as the framework, and treating electronic commerce (EC) as a form of new innovation, we analyse factors affecting EC diffusion. A multiple regression analysis is carried out, with the five attributes of innovation highlighted by Rogers, to determine the attributes that affect the willingness to adopt. Out of the five factors affecting the adoption of electronic commerce by SMEs, only relative advantage, compatibility and trialability appear significant, with the overall regression explaining around 36% of willingness to adopt. © 2001 Elsevier Science B.V. All rights reserved.

*Keywords:* Electronic commerce; Innovation diffusion; Small and medium-sized enterprises

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## 1. Introduction

Electronic commerce (EC) is the culmination in business of increasing computing power and declining telecommunication costs; it is revolutionising transactions as well as radically changing the supplier and customer relationships in business.

The value of worldwide EC is expected to reach US\$ 300 billion by the year 2000, according to Dryden (1998). Despite this high potential, Asian businesses are still reluctant to infuse EC into their business processes. Asia as a whole appears less engaged in EC compared to the United States and Europe. One apparent explanation could be that many

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Asian countries tend to be less developed than Western countries. A more complete explanation of the lag, however, must include related problems that Asian countries have, including lower personal computer penetration, inefficiently managed telecom monopolies, language barriers, hierarchical corporate cultures, and often intrusive and bureaucratic governments (Anderson, 1998).

In spite of the inertia, several Asian countries (e.g. Hong Kong, Malaysia and Singapore) are in the process of creating IT infrastructure that will facilitate EC innovation and are attempting to remove the above-mentioned barriers. These countries are aware of the fact that the next several years will see tremendous growth in business-to-business EC. Businesses in Asia will need to link their value networks in order to maximise resources and economise on costs, given the potential offered by EC. Businesses that fail to take advantage of technological advances will decline (Dryden, 1998).

This study's focus is on Singapore, which is currently promoting EC with various initiatives (NCB, 1998a, 1999). For instance, the Electronic Commerce Hotbed (ECH) programme by the National Computing Board (NCB) is designed to bring together major EC players in order to hasten realisation of EC in Singapore. There are other initiatives that are designed to turn Singapore into an EC hub. In particular, several initiatives in Singapore are targeted at small and medium-sized enterprises<sup>1</sup> (SMEs) (Yap, 1999). There are 92,000 SMEs in Singapore, and together they make up 92% of all establishments, and employ 53% of the workforce. Yet, SMEs contribute only 34% to Singapore's GDP (Yap, 1999). Although this contribution may look small, SMEs are important to Singapore economy in several ways. "Many MNCs today were SMEs of yesteryear. SMEs are the incubators of our future economic giants" (Yap, 1999). Moreover, many SMEs engage in international businesses.

This study is significant for several reasons. Firstly, it fills a knowledge gap about EC diffusion in Singapore, and aims to identify which factors are important for encouraging willingness to adopt EC. Prior research in Singapore has indicated that merchants are still uncertain about the business potential of the Internet as a medium for trading and payment (Lee et al., 1997). Security concerns emerged as the most important consideration to merchants when using the Internet (Lee et al., 1997). Retailers are still more comfortable with traditional forms of retailing than with on-line sales transactions (Abbas et al., 1998). They are unwilling and/or unable to invest sufficient resources to make on-line shopping successful here (Abbas et al., 1998). Although these studies focus on business-to-consumer rather than business-to-business EC, they indicate a low level of willingness to adopt EC.

In the same vein, the results of a 1999 NCB survey of 666 Singapore businesses echoed the same low appeal for business-to-business EC. Results indicated that 8.5% of the

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<sup>1</sup> The association of small and medium-sized enterprises (ASME) of Singapore defines an SME as a company with employees not exceeding 100 and an annual turnover not exceeding \$15 million (see <http://www.asme.org.sg>). Singapore statutory boards, such as the Singapore Productivity and Standards Board (STPB) and the Economic Development Board (EDB) have different definitions that consider other factor (e.g. local equity and/or fixed assets). Our research will utilise the ASME definition given that our survey respondents are member of ASME.

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