Chapter VI

Diffusion of Electronic Commerce in Australia: A Preliminary Investigation

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Diffusion is the process by which a new technology spreads in its usage among a population. This chapter analyses the diffusion process of one aspect of the consumer-to-business electronic commerce (EC) in Australia, namely Internet shopping. The chapter first reviews three popular logistics diffusion models from the literature and then applies them to the EC diffusion data. Results show that the most flexible model is not significant, while the simple diffusion model (Blackman's) is. It was also found that the past diffusion process had been mostly influenced by the "internal" interactions between the adopters and the potential adopters of EC. Further analysis of the Blackman's model revealed some high level policy guidelines to enhance the diffusion process further into the future. Limitations of the study and future research directions were also identified.

INTRODUCTION

Electronic commerce (EC), both Internet-based or by some other networks, is changing the way organizations perform their tasks, interact with the customers and in general do their business. Among the myriad of computer and telecommunication-based applications of the modern era, the advent of EC is having the biggest impact on organizations and its customers. EC is not only changing the business processes, it is also changing the organizational structure to support the new processes. EC is not only "buying and selling" of products via electronic means, it involves all other activities to support the sale process (Applegate et al. 1996).

Although the term electronic commerce is wide spread and well accepted in the academic and business community, Wigand (1997) points out that "the term electronic commerce is poorly understood and frequently used to denote different meanings." Taking

a broad perspective the author defines EC as the seamless application of information and communication technology to the entire value chain of business processes, conducted electronically, in order to achieve an organizational goal. Wigand (1997) highlights the need for supporting an organizational goal by electronic means. Nath et al. (1998) review various definitions of EC, which vary from pure use of technologies (e.g., e-mail, EDI, etc.) to supporting organizational needs to searching and retrieving information for corporate decision making. The authors summarize two key points of EC, which are: (i) to simplify and streamline business processes by electronic means, and (ii) to enable and facilitate the formation of electronic markets.

Kalakota and Whinston (1997) provide the most comprehensive definition of EC. The authors take four perspectives as *communication*, *business process*, *service*, and *online* to define EC. From the *communication* perspective EC is meant to support the communication needs of various tasks (delivery of products/services, payments, etc.) via various electronic means. From the *business process* perspective the primary goal of EC is to automate the business transactions and workflows (Kalakota and Whinston, 1997). From the *service* perspective EC is meant to cut the service costs of the organization and provide better service to the customers. The *online* perspective assumes the primary goal of EC to support the product buying/selling via Internet and other online means. It is observed that the four perspectives taken by Kalakota and Whinston (1997) are not discrete. They overlap to a great extent. For example, automating the business process would result in better communication and reduce the service of the organization. Similarly, online product buying/selling would improve the service to the customers/suppliers and result in better communication and streamline the corresponding business processes.

Research on EC had been diverse. This chapter, however, concentrates on the research on the adoption and diffusion of EC by organizations. It is interesting to note that most of the research on EC, in some way or other, deals with the opportunities and problems with EC. These opportunities and problems, of course, act as the factors of successful (or unsuccessful) adoption and diffusion of EC by organizations. Based on the interview with 10 executives Nath et al. (1998) concluded that benefits of the Internet-based EC are broad, ranging from global reach to image enhancer. The authors also found major perceived problems with EC as security, costs, legal issues, maintenance, etc. Auger and Gallaugher (1997) concentrated their study on small business EC adoption and found a number of factors in favour or against the adoption of EC. The study was exploratory in nature. Poon and Swatman (1999) did a longitudinal study on the gap between expectation and realization due to EC by a group of small businesses. The authors found that many of the expectations of the small businesses did not materialize eventually. Behrendorff and Rahman (1999) provided a brief look into the adoption of EC in small to medium enterprises in Australia. The authors found the organizational, technological and the role of government as the main factors of adoption of EC. Opportunities and problems with EC have also been studied, among many others, by Ng et al. (1998), Cunningham and Tynan (1993), Bolisani et al. (1999), Palmer (1997), and Giaglis et al. (1999).

Background

Theoretical background to technology diffusion in general and EC in particular is presented in a later section. However, we briefly highlight here some related studies to put our current research in perspective. Two important phases of technology acquisition by organizations are *adoption* and *diffusion* (in that order) (Rogers 1983). However, without

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