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FACTORS INFLUENCING THE ADOPTION OF E-MARKETPLACES BY SMALL ORGANIZATIONS: AN EMPIRICAL INVESTIGATION

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Abstract

The past several years have witnessed the emergence of B2B electronic marketplaces. The expected elimination of market inefficiencies in such setups has driven large corporations to place significant investments on this type of e-commerce initiative. However, many e-marketplaces have encountered tremendous challenges. A frequently quoted explanation for the failure of e-marketplaces is the weak adoption rate among the small business community. Because of this, we intend to examine factors influencing small businesses' decisions to participate in e-marketplaces. Based on an extensive literature review, we have developed a model describing three categories of factors (information systems, organizational, and environmental) impacting a small firm's decision to join an e-marketplace. To refine the model and assess its applicability, a series of case studies will be conducted.

Keywords: Business-to-business (B2B) commerce, electronic marketplace (e-marketplace), small businesses

Introduction

A business-to-business (B2B) electronic market (hereafter referred to as e-marketplace) is an interorganizational information system (IOS) serving as an intermediary to facilitate the exchange of information about products and/or support business transactions between participating buyers and sellers (Christiaanse and Markus, 2002). This study focuses on the adoption process of small firms in deciding whether to join e-marketplaces as either buyers or sellers (usually through a membership type of arrangement).

Despite the potential benefits of e-marketplaces (Malone, *et al.* 1987, 1989; Bakos, 1991a, 1991b; Johnston and Vitale, 1988), it wasn't until the advent of Web-based e-commerce that corporate executives, venture capitalists, and Wall Street analysts paid serious attention to them. In the late 1990s, Wall Street witnessed soaring market valuations of e-marketplaces in view of highly optimistic growth projections (Enos, 2001; Pastore, 2001). However, during a shakeout period starting at the end of 2000, many e-marketplaces ceased their operations whilst others encountered tremendous challenges in their attempts to survive.

Practitioners and researchers often attribute the failure of these e-marketplaces to inadequate participation, particularly by small companies (e.g., Mello, 2002; Bloch and Catfolis, 2001; Bannan, 2001; Joachim, 2002). This is hardly surprising, given the critical role of small firms in the economy: 25 million small firms in the U.S. create 75 percent of the new jobs and contribute to more than half of the nation's GDP (SBA, 2002b). Therefore, an empirical study on the factors affecting the adoption of e-marketplaces by small businesses will be of importance to both practitioners and researchers.

Discussions of the evolution of e-marketplaces are anything but scarce. Much of the research, however, focuses on (1) the governing structure of e-marketplaces and their recommended business models (e.g., Bloch and Catfolis, 2001; Christiaanse and Markus, 2002; Dai and Kauffman, 2002; Soh and Markus, 2002; Tomak and Xia, 2002), (2) the impacts of e-marketplaces on industry structure and supply chain performance (e.g., Bailey and Bakos, 1997; Clemons *et al* 1998; Lee, 1998; Mithas *et al.* 2002), and (3) large corporations and their ability to gain a competitive advantage by either initiating or joining e-marketplaces (e.g., Choudhury *et al* 1998; Kaplan and Sawhney, 2000; Tumolo, 2001). Unfortunately, the role of small firms in e-marketplace arrangements has been neglected in most of these studies. Our research seeks to fill this void by focusing on the decision of small firms to (or not to) participate in existing e-marketplaces.

Our research has two objectives: (1) to provide an integrated model of small businesses' adoption of e-marketplaces, and (2) to empirically assess the applicability of the proposed model. This research will enable us to understand the motivators and inhibitors affecting small firms' potential participation in the e-marketplace evolution.

Expected Contributions

As one of the first empirical studies to investigate the factors influencing small businesses' participation in e-marketplaces, our research provides practical and research-related contributions. Firstly, based on an extensive literature review, it proposes a conceptual framework depicting key variables affecting the decision of small businesses to join e-marketplaces (this model will be empirically validated). This research work will contribute to our cumulative knowledge in the field of IOS adoption and can be used in future research studies of other electronic, inter-firm linkages. Secondly, it will allow practitioners to identify and evaluate fundamental e-marketplace attributes as well as strategies that would enhance the likelihood of adoption by small firms.

Research Model and Literature Review

Recent findings suggest that small businesses are less likely than large firms to participate in e-marketplaces (Buckley and Montes, 2002; Davenport *et al*, 2001). To explain this phenomenon, we will describe a model (see figure 1) summarizing enablers and inhibitors influencing the behavior of small firms. This model was formulated by reviewing the IOS adoption literature. As models of IOS adoption developed in the large-business context may not be directly applicable to small businesses – due to fundamental differences in organization structures, sophistication, and availability of financial resources (Thong, 1999) – our work has been mainly influenced by the significant research stream on small business IS adoption (Iacovou *et al.*, 1995; Harrison *et al.*, 1997; Thong, 1999; Chwelos *et al.*, 2001). In particular, our model refined and augmented the EDI adoption model for small business developed by Iacovou *et al.* (1995) and enhanced by Chwelos *et al.* (2001).

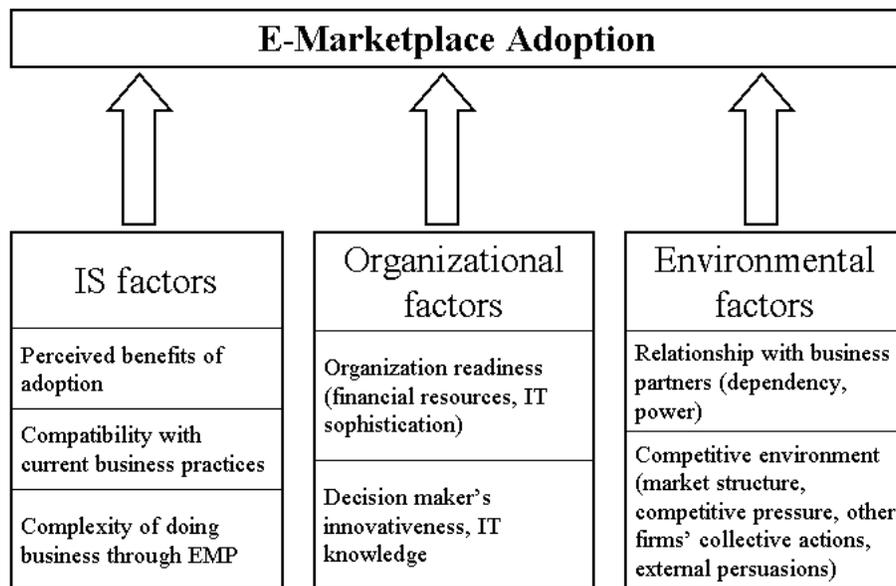


Figure 1. Model of Small Business E-Marketplace Adoption

The studies conducted by Iacovou *et al.* (1995) and Chwelos *et al.* (2001) are especially relevant to our research because – much like e-marketplaces – their technology of interest (EDI) is a type of inter-firm, networked IS (Malone *et al.*, 1987; Bakos 1991a, 1991b, 1997). As both types of systems (EDI and e-marketplaces) are complex and innovative, require considerable skill and know-how to implement and operate (Webster, 1995), and are affected by network externalities, we believe that these studies are especially pertinent to our investigation.

Iacovou *et al.* (1995) and Chwelos *et al.* (2001) conceptualize three levels of factors (i.e., technological, organizational and interorganizational factors) influencing IOS adoption behaviors by small businesses. In the e-marketplace context, technological as well as business-related features are used to characterize an IOS. Furthermore, market structure and competitive pressures are found to have significant influences on IOS adoption decision. Therefore, to more accurately reflect the scope of these three categories, we renamed them as: Information Systems (IS) factors, Organizational factors, and Environmental factors. Each category contains several salient factors, which are discussed in detail in the following sections.

It is noted that other researchers (e.g., Chau and Jim, 2002; Kuan and Chau, 2001; Premkumar *et al.* 1997) have proposed similar models in studying IOS adoption by small firms. However, none of these studies have specifically examined e-marketplaces in the small business context. Therefore, our work can provide a unique contribution to the cumulative knowledge in the field of IOS adoption.

Information Systems (IS) Factors

By information systems factors, we refer not only to the technological characteristics of such systems, but also to business-related characteristics associated with e-marketplaces. In previous studies on IOS and EDI adoption (e.g., Iacovou *et al.* 1995; O’Callaghan *et al.* 1992; Premkumar *et al.* 1997, Teo *et al.* 1995), perceived benefits, compatibility and complexity of the system were found to influence the adoption decisions of organizations. These three factors closely correspond to the two variables – perceived usefulness and perceived ease of use – in the Technology Acceptance Model (Davis, 1989), which has been successfully employed to understand IT usage in the workplace.

Perceived Benefits

Dai and Kauffman (2002) summarize the various benefits of e-marketplaces as (1) reduced time and effort to search for prices and product information, (2) enhanced buyer-supplier coordination, and (3) increased operational efficiency for both individual organizations and the whole value chain. As the adoption of e-marketplaces by small businesses is a voluntary decision, the level of awareness (and believability) of such benefits is likely to strongly influence their attitudes toward doing business in e-marketplaces.

Compatibility

Rogers (1995, p. 224) defines compatibility as “the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of the potential adopter.” In our model, compatibility refers to the degree to which the e-marketplace integrates well with current practices of small businesses. Compatibility was found to be a significant factor in earlier IOS studies (Kumar and Dissel, 1996; Premkumar et al, 1997; Au and Kauffman, 2001) – mainly due to the lack of resources and IT sophistication in small firms.

Complexity

A system’s complexity is known to inhibit adoption (Rogers, 1995). In view of the limited IT knowledge in small businesses (Lees, 1987), the complexity of doing business through e-marketplace is expected to have a significant impact on adoption intention. Compatibility and complexity jointly determine small businesses’ perception on the ease of doing business in e-marketplaces.

Organizational Factors

Like EDI, e-marketplace adoption is almost always an organizational-level decision executed in an interorganizational context (Bakos, 1998). Rogers (1995) labels this type of adoption as an authority innovation decision. Because of this, certain aspects of the adoption decision cannot be captured by merely looking at IS-level factors. Consequently, the impact of key organizational

factors (i.e., organizational characteristics likely to influence a decision to adopt a particular system) is relevant and was incorporated in our model.

Organization Readiness

To join an e-marketplace, a small firm needs to acquire and set up the necessary software, hardware and Internet connection, and train its employees to use the system. Also, the e-marketplace is likely to collect a membership fee and ongoing transaction fees from participating companies. Therefore, the readiness of a firm (in terms of available financial resources and technological sophistication) will affect its ability to join an e-marketplace. Indeed, prior research (Swatman and Swatman 1992; Iacovou et al. 1995) indicates that adoption of IOS is more likely to occur when organizational readiness is high.

Decision Maker's Innovativeness and IT Knowledge

In small firm settings, an organization's attitude toward IT innovation is largely determined by the key decision maker's characteristics, especially their innovativeness and IT knowledge (Harrison et al., 1997). Several studies (e.g., Birley, 1982; Cannon, 1985; Rogers, 1995) have demonstrated that the abilities and inclinations of a small firm's key decision maker, usually the CEO and/or the owner, plays a crucial role in its adoption of technological innovations. Therefore, we included decision maker's innovativeness and IT knowledge in our model.

Environmental Factors

Given that the adoption of e-marketplaces will change a firm's interactions and relationships with its business environment (customers, suppliers, partners, competitors, etc.), we expect environmental factors to play a significant role in such decisions. Our review indicates that two environmental factors are especially likely to influence IOS adoption decisions.

Relationships with Business Partners

Relationships with business partners can affect IOS adoption decisions (e.g., Riggins and Mukhopadhyay, 1994; Webster, 1995; Premkumar et al., 1997; Chwelos et al., 2001). For example, large retail chains, such as Wal-Mart and Sears, have insisted that their suppliers either use EDI or lose their business (Premkumar et al., 1997). There are cases where some auto-part suppliers were forced to join an e-marketplace, which were backed by powerful automobile manufacturers (Walsh, 2000). Relationships with trading partners can take at least two forms (Provan, 1980): (1) dependency on trading partners (trading partners' potential power to encourage or coerce e-marketplace adoption) and (2) enacted trading partner power (the strength of an influence strategy to actually exercise power). Given the uneven power and dependency between small businesses and their large partners, relationships with business partners may play an even greater role in e-marketplace adoption by small businesses (as compared to large businesses).

Competitive Environment

The competitive environment surrounding an organization is reflected by the external pressures arising from several sources: market structure (i.e., centralized or decentralized) (Lee and Clark, 1996); competitive pressure from the industry, which is related to the ability of e-marketplace to maintain or increase competitiveness (Saunders and Clark, 1992); collective actions of other firms (suppliers, customers, or competitors), network externalities (Rogers, 1995) of e-marketplaces; and external influences from industry associations and lobby groups. Understandably, such factors are expected to influence the adoption of e-marketplaces.

While our review has identified several salient factors that are likely to affect a small firm's adoption decision, we suspect that more factors may be at play. In addition, both practitioners and researchers will be interested to know how and to what extent these factors influence adoption decisions – both for specific industries and for specific types of e-marketplaces. Through a series of case studies, we hope to verify the proposed model, identify new factors affecting small businesses' adoption that have not been studied in prior research, and gain a better understanding on the nature of small businesses' adoption of e-marketplaces.

Research Method

In view of the scarce research on e-marketplace adoption by small firms, we plan to conduct a series of case studies to both assess and expand our model. We have selected the case study approach because it is the preferred strategy for developing a theoretical model and for answering “how” and “why” questions (Yin, 1989). By interviewing managers of small firms, we can gain an in-depth understanding on why small firms decide to (or not to) adopt e-marketplaces, and what enablers and inhibitors influence their adoption behavior.

Sample

The U. S. Small Business Administration (SBA, 2002a) defines small businesses based on size standards for each individual industry. The SBA (2002a) has established two widely used standards (upper limit) – 500 employees for most manufacturing and mining industries and \$6 million in average annual revenues for most non-manufacturing industries. We will adopt the above criteria in selecting candidate companies for our study.

Our sample will consist of ten small businesses in select manufacturing and service sectors. Eisenhardt (1989) suggests that the ideal number of cases in case study research is between four and ten. Both e-marketplace adopters and non-adopters will be included in our study. High-level decision-makers will be our primary informants.

Data Collection and Analysis

The main data collection method will be face-to-face, structured interviews with the managers of the companies. All interviews will be audio-recorded and transcribed before the data will be analyzed. Structured interview guides will be used to ensure consistency and reliability.

The data collected will be used to: (1) assess the applicability of the proposed model, and (2) identify other influential factors that are not included in the proposed model.

Preliminary Findings and Future Research

During the process of identifying potential case sites, we have conducted some initial interviews and obtained some preliminary findings:

- 1) Small firms are interested in the economic benefits offered by electronic trading. However, the managers' awareness of e-marketplaces (and their associated benefits) is low. This is especially prevalent in non-adopter firms. Without positive perceptions on the usefulness and ease of use of the technology underlying e-marketplaces, these small firms (non-adopters) are unlikely to voluntarily adopt e-marketplace. Therefore, “consumer” training and education will be a critical issue for e-marketplace operators, who are eager to increase the number of participating members.
- 2) For some small firms, adoption is also unlikely because of environmental influences. One firm closely follows industry norms (dictating the sale of its products through servicing dealers) and is not ready for a radical change in its sales practices because it highly values its existing relationships with the dealers. The manager indicated that e-commerce initiatives are seen as threatening by dealers and thus the company does not intend to jeopardize its rapport and relationships with them.

As the above preliminary findings indicate, several factors in our model (e.g., perceived benefits and relationships with business partners) seem to be at play. In considering e-marketplace adoption, small businesses seem to carefully weigh the enabling factors (e.g. benefits) and hindering factors (e.g. jeopardizing relationships with dealers).

Upon the completion of this research, we expect to derive a comprehensive model of e-marketplace adoption by small businesses. This will enhance our understanding of small businesses' decisions regarding e-marketplace participation and will provide practical advice to encourage e-marketplace adoption by small businesses.

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