PERM: A Model of E-Commerce Adoption in Developing Countries

Alemayheu Molla

Department of Information Systems, University of Cape Town & Faculty of Business and Economics, Addis Ababa University
Tel: +27 21 650 4233, Fax: +27 21 650 23280, amolla@commerce.uct.ac.za

Paul S. Licker

Department of Information Systems, University of Cape Town, Tel: 27 21 2582, Fax: 27 21 650 2280, plicker@commerce.uct.ac.za
and Department of Management, Long Island University, Tel: (516) 299-2943, Fax: (516) 299-3917, paul.licker@liu.edu

ABSTRACT

A growing volume of literature proclaims the benefits of e-commerce for developing countries. However, unless business organizations in developing countries incorporate e-commerce into their operations, the benefits will not appear. Also lacking are models through which to discuss e-commerce adoption in developing countries. This paper proposes such a model called the perceived eReadiness model (PERM). The model posits that an organization's perceptions of its internal (POER) and external (PEER) eReadiness influence both the initial adoption and the subsequent maturity of e-commerce.

INTRODUCTION

Many in development and academic quarters (see for example Adam, 1996; ECA, 1999; CID/HU, 1999; Goldsten & O'connor, 2000; Kamel and Hussein, 1999; Montealegre, 1996) hail e-commerce as having the potential to create new opportunities, eliminate barriers and improve efficiency of businesses in developing countries. As a result, the adoption of e-commerce is considered to be an important factor in facilitating the growth of developing countries as well as the success of the global economy (McConnell & WITSA, 2000). The extent of e-commerce uptake in developing countries and subsequent benefits remain unknown. There is little systematic information on what drives e-commerce adoption in developing countries. Specifically, there does not appear to be a model that can be applied in the investigation of the determinants of e-commerce adoption in developing countries. This paper introduces such a model, which we refer to as the perceived eReadiness model (PERM).

THEORETICAL BASE

A number of studies have investigated the organizational adoption of IT by developing empirical research models drawn from a wide variety of perspectives such as organizational change (Moreton, 1995; Orlikowski, 1991), managerial action (Kraemer and king, 1981), institutional (Kling and Iacono, 1989; Orlikowski, 1993); and political and social (Kling and Scacchi, 1982; Robey & Boudreau, 1999). Except in a few cases (Boer and Walbeek, 1999; Ein-Dor et al, 1997; Kasongo,1993; Montealegre, 1999a) most of the previous studies tend to examine businesses in the developed countries. However, because of the apparent differences in the social, business, economic and technological contexts of developed and developing countries, the findings of such studies are hardly generalizable. In addition, the majority of the research is concentrated on the implementation stage with little empirical research on the determinants of IT adoption.

Studies that investigate IT adoption by organizations more directly (Cheochan et al, 2000, Orlikowski, 1993; Seyal et al, 2000; Thong, 1999; Thong and Yap, 1995) identify a number of factors related to the CEO, the context of the organization, the technology and the environment as determinants of IT adoption. However, there are some limitations related to the theoretical and operational constructs of the models used in these studies.

These include an obvious focus on pre-e-commerce era, an inability to conceptualize and research network externalities (Bailey et al, 1995), and the inapplicability of antecedents such as organizational size, complexity, sector and CEO characteristics to technology adoption. A number of studies (Akkeren and Cavaye, 1999; APEC, 1999; Baldwin, 2001; Behrendorff and Rahman, 1999; Chappell, et al, 1999)

argue that e-commerce provides small and medium sized organizations (the overwhelming mode in developing countries) opportunities equal to, if not exceeding, their bigger counterparts. For example, managers in developing countries, despite having the 'innovative' attributes, might not have a range of options from which to choose an innovation and the environment might put significant constraints on the kinds of innovations to which the managers aspire (see Munene, 1995).. Hence, there is much to be learned if the focus of the investigation shifts to what the CEOs perceive of their internal and external environment rather than what they might think of themselves and their IT knowledge (Bekele, 2000; Kebede, 2001).

In relation to e-commerce adoption and diffusion in developing countries, a new stream of literature called "eReadiness" has also emerged. Over the last two to three years, a number of eReadiness assessment tools have been developed (see www.bridges.org for a summary). Practically, each tool differs from the others in terms of its conceptualization of eReadiness, its goal, the eReadiness being measured, results and standards. The literature on eReadiness does not provide us with a conceptually strong, theory-based model to investigate e-commerce adoption in developing countries..

In general, from the review of the literature, it can be learned that there is a clear lack of appropriate model to investigate e-commerce adoption in developing countries. In the following section, we introduce a model of e-commerce adoption in developing countries called the Perceived eReadiness Model (PERM).

PERM

The general argument of the proposed model is that *perceived eReadiness* explains e-commerce adoption. We define perceived eReadiness as the degree to which an organization evaluates that it has the internal preparation and favorable external conditions to conduct e-commerce. Thus defined, the concept has two constructs- Perceived Organizational eReadiness (POER) and Perceived External eReadiness (PEER). Taken together, PEER and POER should predict e-commerce adoption and explain a significant part of the variance in the level of e-commerce adoption.

The Constructs of PERM

In elucidating the specific operational constructs of the model, we borrow from the socio-technical system theory of organizations and Porter's competitiveness theories.

The socio-technical system theory premises that an organization is a combination of social and technical components open to its environment (Trist and Pollack, 1963). Leavitt (1965) proposed that

organizations can be viewed as the interaction of task, technology, structure and people. The model, enhanced by Delsi (1990) and Guha et al (1997) implies that one can study organizational systems in terms of the organizational processes, organizational structure, (information) technology, the cultural assumptions in the organization, the nature of its leadership, and organizational resources.

The relevance of the above to the proposed model of e-commerce adoption is clear. It helps to systematically define the components of an organization. Thus, the discussion on the constructs of the perceived organizational eReadiness (POER) needs to reflect the components of an organization that affect e-commerce adoption. The emphasis is thus to assess an organization's eReadiness in terms of its main components as perceived by its top managers.

Porter (1990) suggests the theory of the competitiveness of nations. According to Porter, *factor conditions, demand conditions, related and supporting industries, firm structure rivalry and strategy and government* are the most important attributes that shape the environment in which local firms operate and compete. He suggests that a firm must understand what it is about its home nation that is most crucial in determining the firm's ability to operate successfully. Hence, the perception of an organization about the eReadiness of its customers and partners; the perceived role played by the government in promoting e-commerce and the availability of support and conducive factors for conducting e-commerce from other relevant industries might affect e-commerce adoption. In addition, the structure and strategy attribute in Porter's theory of competitiveness provides further support for the constructs of organizational eReadiness.

Using the theoretical underpinnings discussed above, it is now possible to discuss the detailed constructs of PERM. Perceived **organizational** eReadiness (POER) is defined as managers' evaluation of the degree to which they believe that their organization has the awareness (A), resources (R) and commitment (C) to implement e-commerce. Perceived **external** eReadiness (PEER), on the other hand is the degree to which mangers believe that the market forces (PMFR), the government (PGER) and other supporting industries (PSIR) are ready to facilitate the organizations' e-commerce implementation. We hypothesize that both POER and PEER predict the organizations' initial e-commerce adoption and the maturity of e-commerce adoption.

Figure 1: The perceived ereadiness model (PERM)
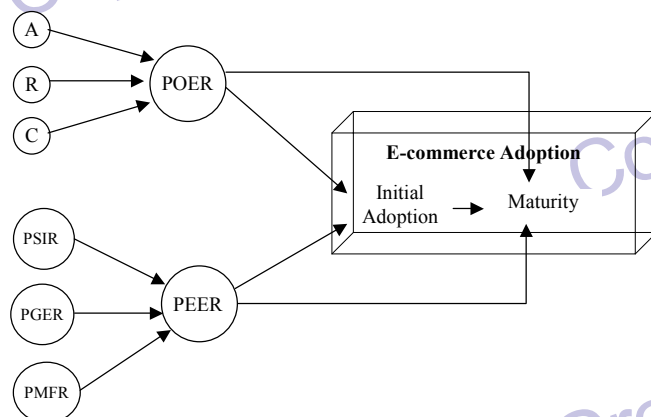
E-commerce Adoption

E-commerce today means many things to different people. There exist a wide variety of e-commerce definitions and conceptualizations. It involves a cluster of technologies (computing, communication, publishing, security, payment) that are used to perform a range of business functions (public relations, communication, buying, selling, marketing, customer service, procurement) among and within producers, suppliers, customers, government, and intermediaries (Molla and

Licker, 2001). Hence, in investigating e-commerce adoption in developing countries, one needs to clearly define the "e-commerce" being referred to. Otherwise, it will be difficult to make proper comparison of study outcomes that investigated for instance e-mail with others who used the Web.

The literature documents that organizations both in the developed and developing world cannot become e-commerce affluent overnight and follow certain migration paths, but not necessarily in a linear fashion (Hackbarth and Kettinger, 2000; APEC, 1999; NNI, 1999). Consistent with Zaltman et al (1973), e-commerce adoption is therefore best seen as *initial adoption* and *maturity*. While the first dimension shows the initial adoption of e-commerce, the second dimension indicates the extent, nature and use of e-commerce once the organization adopts it.

Perceived Organizational eReadiness (POER)

POER is a function of the level of e-commerce awareness, the organization's commitment to implement e-commerce and the stock (or soon to be acquired) of human, business and technology resources.

Awareness

The literature on the process of technology adoption unequivocally agrees that awareness about the innovation and its benefits is an important initial stage that might subsequently affect the decision to adopt or reject an innovation (Licker, 1997). Likewise, the importance of awareness seems well recognized in the e-commerce literature where studies indicated that lack of e-commerce awareness and having little or superficial knowledge of *e-commerce technologies* as the crucial problems in the successful application of e-commerce (APEC, 1999; Behrendorff and Rahman, 1999; ECA, 1999; Han and Noh 1999). The problem is aggrevated in developing countries. In assessing organizational e-commerce awareness, one needs to focus on awareness of competitors' and partners' e-commerce implementations and global trends, knowledge of appropriate and relevant e-commerce models, perceived benefits, opportunities and threats of e-commerce and assessment of the perceived future impacts of e-commerce on their business and industry.

Resources

These are the available or to be acquired means that can be employed for participating, progressing and succeeding in e-commerce. Resources possessed, developed and deployed by an organization define the capability of that organization to respond to the requirements of e-commerce (Collins and Montgomery, 1997). Since organizations differ in significant ways because of the stock, uniqueness, durability, specificity, heterogeneity, and inimitability of their resources, such differences could be attributed to variation in performance. Resources are commonly classified as human, business and technological Lack of resources is one of the stumbling blocks that managers in developing countries have to face while attempting to implement e-commerce (Montealegre, 1996). Therefore, the organization's perception of the availability or cost of acquiring the resources is likely to influence both the initial e-commerce adoption and subsequent maturity.

Commitment

Existing literature accentuates the role of managers' (especially CEOs') commitment for the adoption and successful outcome of e-commerce and other innovations (Powell and Micallef, 1997; Sillince et al, 1998). The commitment of the organization as a whole from the apex to the core is clearly necessary. Organizational commitment might be manifested through resource allocation, management agenda locale, the extent of strategic involvement, the nature of e-commerce championship and so on. In developing countries where frequent turnover of managers engenders a view of predecessor's projects with some degree of skepticism, maintaining the momentum of commitment is essential both to the initial adoption and subsequent maturity of e-commerce.

Perceived External eReadiness (PEER)

Our model postulates that the organization's perception of the eReadiness of the market forces (PMFR), government (PGER) and supporting industries (PSIR) affects the initial adoption and maturity of e-commerce through PEER.

Perceived Market Forces eReadiness (PMFR)

An organization's perception of the connectivity, trust and willingness of the market forces such as customers, suppliers and other partners to conduct business electronically might affect its decision to adopt e-commerce and the maturity level of e-commerce. Organizations that perceive that their customers and partners are ready to conduct business electronically are more likely to adopt e-commerce than when there is no such perception (NNI, 1999;   Sillince, 1998).

Perceived Government eReadiness (PGER)

Much has been said about the role governments of developing countries are expected to play in promoting e-commerce (ECA, 1999). However, the literature is often in conflict as to the nature and extent of government involvement. But the literature agrees that the policies, regulations, protections and frameworks governments put in place for the conduct of business in particular and the economy in general affect e-commerce diffusion. Organizations, which perceive that their governments are committed to lay the policy, legal and regulatory conduits for e-commerce are likely to adopt e-commerce than those who view government policies and actions as hostile or not encouraging, especially in the developing world.

Perceived Supporting Industries eReadiness (PSIR)

The conduct of e-commerce depends on a number of support-giving industries whose activities might impact an organization's e-commerce adoption decision. In relation to e-commerce, three such industries could be identified - the availability and affordability of services from the ICT industry, the maturity and development of the financial sector to facilitate electronic transactions and the penetration and reliability of carrier and transportation facilities (fulfillment service providers). An organization's perception about the readiness of these supporting industries might affect the adoption of e-commerce. The IT industry is significant as it can play a proactive role through supply push strategies, showcases and awareness building schemes, perhaps magnified in the developing world.

CONCLUDING REMARKS

The proposed model is based on the argument that perceptions by managers of an organization could be used as proxies to assess the organization's perception in terms of its internal and external eReadiness. Such perceptions in turn affect the adoption and subsequent maturity of e-commerce. The focus on perception is consistent with existing models and theories of adoption. While this model is designed to assess e-commerce adoption in developing countries, in the empirical examination of the model one needs to consider the profound differences that exist among the developing countries. The concept of developing countries represents more than 142 countries, of which no two are alike (Austin, 1990).

Finally, further research is encouraged to refine both the theoretical and operational constructs of the model.

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