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The Internet and the Organizational Adoption of Electronic Business: A Research Agenda

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ABSTRACT

The late nineties witnessed adoption of the Internet by organizations, on a very large scale. However, not every organization did experience an equally deep penetration of the Internet in its business. It was followed by the dot-com bubble burst. Many researchers have studied the phenomenon of organizational adoption of the Internet and the associated success factors. However, the available literature is fragmented in nature and does not take into consideration certain fundamental concepts. Therefore, there is a need for an enhanced understanding of the phenomenon. It will enable executives to plan for and implement Internet adoption in a more effective manner. This paper discusses the literature and brings out the inadequacies in the current findings. Subsequently a framework is developed to indicate directions for future research.

Keywords: Internet, IS adoption, E-Business adoption, E-Business drivers

1. INTRODUCTION

Information technology (IT) has been a part of virtually every business, particularly in the developed world, for the last two decades. The advent of the personal computer (PC) in the early eighties brought in a quantum jump in the scale of adoption of IT by organizations. The late nineties witnessed yet another wave of IT – the widespread adoption of the Internet by organizations, on a very large scale. Many researchers, from the fields of business strategy and information systems alike, have studied the phenomenon of adoption of the Internet by organizations in general [Stephan 2002], and the Internet boom and bust in particular. It has been observed that at one extreme of the spectrum of adoption of the Internet, organizations just put up a website with skeletal information. While at the other extreme, organizations carry out their entire business through their website, have adopted a web-based architecture and totally integrated the Internet into all their important business processes.

It is necessary for practising managers to understand the factors responsible for the above differences observed across organizations. Often organizations cannot use the Internet as planned or in an effective manner for their business. An understanding of the factors behind Internet adoption will enable them to evaluate the suitability of their organizational environments and their management strategies to the desired levels of Internet adoption. It will also enable them to plan for and implement Internet adoption in a more effective manner.

While the currently available research studies do describe some factors which influence the phenomenon of Internet adoption by an organization, they do not discuss the collective influence of the factors on the phenomenon. The studies do not also explain the nature of their influence on the level of Internet adoption.

Therefore, these studies do not lead to concrete managerial implications or actionables for managers. At the same time however, rapid acceptance and evolution of the use of the Internet has made it imperative for organizations to utilize it very effectively in their businesses. For effective deployment, they are required to have an understanding of the factors behind successful adoption of the Internet at different levels.

Against this background, this paper intends to:

1. Summarize in a critical fashion the recent literature on the phenomenon of e-business adoption, with focus on the different individual influencing factors.
2. Identify the gaps in the current understanding and opportunities for further research.

2. EXISTING AREAS OF RESEARCH

Examining the existing literature, it is observed that there are numerous strategies adopted by traditional firms to implement operations on the Internet. The decision to adopt a particular strategy was influenced by several factors. We study and analyze those factors in the following sections.

2.1 Internet: Perceived benefits

Internet is now the most popular communication medium for conducting business. Characteristics of the Internet [Eder and Igarria 2001] include:

- global, open information and communication platform
 - not owned by any single organization
 - flexible and powerful platform for communicating and interactively sharing information
 - The cost, time and expertise required to connect to this vast network of information is very low
- [Beatty et al 2001], [Lal 2002], [Amit and Zott 2001], suggest that firms push for developing their own websites with the intention of realizing potential

benefits like reduced transaction, advertising and distribution costs, elimination of intermediaries, reduced time to complete transactions, capture of market intelligence, faster information to stakeholders and faster responses to new market opportunities. A few of the other expected benefits include mass customization, building of stronger business relationships, greater degree of channel coordination, improved communication and enhanced customer service [Griffith, Plamer 1999], [McKinney 1999].

Another important driver behind Internet adoption has been the increasing trend towards thin-client computing. Thin clients are essentially slimmed-down desktop computers running applications from a central server [Whittle, Sally 2004]. The evolution of the Web has given users an attractive alternative to implement this architecture. As companies move toward Web-enabling internal applications and as enterprise software vendors increasingly provide Web-enabled software, users can access business applications through Web portals and virtual private networks [Mitchell, Robert 2004]. [Costanzo and Chris 2004] discuss the problems with fat client architecture. One of the solutions is adoption of thin-client architecture. Thin client architecture is more scalable, manageable and flexible than a PC-based architecture [Costanzo and Chris 2004].

2.2 Levels of Penetration of the Internet

[Sohn and Wang 1999] talk about how firms implement Internet market / e-Commerce (EC) at different levels, namely, non-adopters, firms planning to adopt, firms with limited users and firms with sophisticated implementation. [Cockburn and Wilson 1995] studied websites of a sample of 500 companies and classified them based on their use as, website providing basic company information, web presence with company information and information about products and services, website carrying company information, products and services information with price details, further step was adding online ordering to above, and website with online ordering and payment. [Liu et al 1997] have in their study identified ways in which large US firms use their corporate web sites to support pre-sales, sales and after-sales business activities. [Dave and Sambamurthy 1999] in their paper discuss how companies have used the WWW platform to capture the capabilities and business potential of this technological innovation.

[Young and Benamati 2000] visited web sites of all fortune 500 countries to identify predominant types of site content and suggested four categories – customer sales, customer service, communication and informational. [Beatty et al 2001] classify organizations into five categories based on the point in time when they adopted the innovation (Internet) relative to other organizations in their social system, namely, pioneers, early adopters, early majority, late majority and laggards.

Another study conducted for Singapore firms, [Timothy et al 2001] proposed four levels of website development – information and catalogues, database, basic transactions, search and integrated site. [Coleman 1998] developed a framework to represent website evolution from the first generation of organization-centric and intranet based homepages to the fifth generation's business-centric and marketplace integration type of delivery platform expansion. [Enders and Jelassi 2000], [Lal 2002] discuss different modes of e-business (EB) transaction, offline (through emails and messaging systems, online (through dynamic URLs), and using shared or individual portals. [Phan 2002] classified EB applications into three categories of electronic markets, inter-organizational systems and customer support applications. In a different study where New Zealand firms were surveyed [Stephan 2001] suggested that primary motivations for EB initiatives and building websites are to list products and services, provide company data, carry out promotional activities, link to alliance partners, and receive customer orders.

[Teo et al 2003] examined factors influencing Internet adoption at four levels – email adoption, web presence, prospecting, business integration and business transformation. [Mahajan et al 2003] studied the intensity of EB adoption in firms and explained the phenomenon using a matrix, along two dimensions, viz., the implemented process and degree of implementation. A different classification of EB information systems based on information integration and timeliness of information was developed by [Pant and Ravichandran 2000]. [Dutta and Segev 1999] examined and classified web sites based on specific features that had been transformed to the Net.

2.3 Adoption of Technology

Many researchers have proposed technological diffusion models explaining causal factors and outcome variables. [Dewar and Dutton 1986] concentrate on the adoption of technological innovation based on parameters like external exposure, complexity, knowledge depth, management attitudes towards change and centralization. [Iacovou and Benbasat 1995], [Crook and Kumar 1998], [Thong 1999], [Premkumar and Ramamurthy 1997] in their papers suggest that EDI adoption is influenced by perceived benefits, organizational readiness and external pressure. [Teo et al 1996] also attempted to identify a set of factors that a firm requires to concentrate on to enhance its ability to employ IT strategically, the factors being IT drivers, business needs, competitor position, external environment, economies of scale and top management guidance. [Kaun and Chau 2001], [Chau et al 1997] conducted further studies to contribute another EDI adoption model using the technology – organization - environment (TOE) framework.

2.4 Factors driving Electronic business adoption by organizations

Various studies have identified factors, which influence the adoption of EB. These factors can be classified into Internal and External factors. Factors internal to the firm are control variables and are within the firm's control. External factors include the firm's external environment and cannot be directly under the control of the organization. These are disturbance variables.

The different factors have been described below.

Internal Factors

ORGANIZATIONAL FACTORS

Studies in this category have identified sub-categories that influence the adoption of EB.

(a) *Inclination towards New Technology.* A favorable attitude towards systems innovation and inclination towards new technology increases the adoption of EC technologies [Iacovou and Benbasat 1995, Sohn and Wang 1999, Mehrtens et al 2001]. [Premkumar et al 1994, 1995] and [Chircu and Kauffman 2000] argue that different organizations feel the need for EC to different extents. Moreover, early adopters of web technologies laid more stress on the technology being consistent and compatible with organizational norms, existing technology, past experiences and present needs than late adopters [Beatty et al 1999, 2001]. In related findings, by [Grover 1993, Premkumar and Ramamurthy 1995], [Crook and Kumar 1998] and [Sohn and Wang 1999] it has been observed that active support of the top management and users lead to EC systems adoption.

(b) *EB Know-how.* EB know-how (executives' knowledge of EB) and Internet skills are complementary to physical assets and provide the business and managerial skills to adopt and manage EB effectively [Zhu and Kraemer 2003]. Organizational learning ability [Mahajan et al 2003] is an important determinant of EB adoption. Firms with superior IT capabilities, technical knowledge and skills [Mehrtens et al 2000], digital literacy [Slywotzky 2000] and IT sophistication [Chwelos et al 2001], [Crook and Kumar 1998] facilitate the adoption of different EC technologies. Existence of champions and better absorptive capacity of the firm facilitates faster and better adoption of new technologies [Sohn and Wang 1999]. [Chircu and Kauffman 2000] suggest that inability to acquire skill and expertise in new technologies, lack of training and education, and inability to learn new technology, form significant barriers to the adoption of EC systems. Organizations with an aggressive and forward-looking technology strategy [Thomson et al 2003] are more likely to leverage new technologies and Internet to respond to market and environment changes.

(c) *Information Intensity.* Organizations with information intensive products will utilize the Internet technology differently than hard goods manufacturers [Palmer and Griffith 1998], [Takacs and Freiden 1998]. The information content of the product and the

information processing content of the production process determine the applicability of Internet. Organizations with information-intensive value chains or value systems will also differ in their adoption of EB than firms with less information-intensive value chains. Product characteristics, the way customers access it and use it, and the information processing required to be carried out by the customer for the same, affect the adoption of EB technologies [Tarafdar and Vaidya 2002]. The requirement of accompanying information for the product, inherent characteristics determining whether it is digitizable or not and information intensity of the product and processes also act as influencing factors. These are findings from studies by [Porter and Millar 1985 and Grover 1993], [Malone et al 1987][Straub and Watson 1995, Choudhury et al 1998], [Palmer and Griffith 1998].

(d) *Organizational readiness.* IT infusion in an organization is influenced by the MIS climate in the organization and MIS maturity [Eder and Igarria 2001]. [Timothy et al 2001], [McIvor 2000] observed that existing capabilities and prior competencies (existing processes and routines, technology, experience with customer groups) make the transition to a new technology easier. Firms with managerial and IT competencies show a strong commitment to EB and website development. [Kuon and Zmud 1987] discussed the importance of internal technology resource for successful IS adoption. Studies that have used the (T-O-E) framework, show that organizations, which are willing to allocate sufficient resources for the development of IS, tend to have a high degree of IS adoption. [Iacovou and Benbasat 1995], [Kuan and Chau 2001] have reported that organizational readiness which is the availability of adequate financial and technical resources, is an important determinant of the extent of IS adoption. The availability of technically skilled human resources is also a crucial factor influencing the adoption of EB [Crook and Kumar 1998, Chircu and Kauffman 2000]. Internal need and top management support [Premkumar and Ramamurthy 1995], pre-existing distribution structure and channel relationship [Palmer and Griffith 1998], determine Internet applicability [Takacs and Freiden 1998], [Gibbs et al 2004].

(e) *Other Organizational Parameters.* A strong grasp of the expected outcomes, issues and requirement of EB facilitates successful adoption of EB. A few authors have reported the effect of various organizational parameters such as business size [Grover 1993], [Hart and Saunders 1997], [Crook and Kumar 1998], [Thong 1999] and centralization [Grover 1993] on the extent of EB adoption. CEO characteristics (innovativeness and IS knowledge), customer loyalty, trust with regard to the integrity of the information and security of transactions conducted on the Internet, [Thong 1999], [Choudhury et al 1998], are also influencing factors. More informed firms, with greater scope [Zhu et al 2003] are more

likely to adopt EB. Cultures of existing business and EB should gel well.

TECHNOLOGY CHARACTERISTICS

The characteristics of the Internet and other new technologies influence organizational decisions for EB adoption. IS characteristics like complexity, relative advantage, compatibility and the perceived benefits also act as facilitators. Additionally, EB technologies which are compatible with existing applications, hardware and software platforms, and with existing cultural value (related to technology) [Thompson 2003] are more likely to be adopted. Different level of adoption need different combinations of Internet related technology. These findings have been reported by [Grover 1993], [Premkumar et al 1994], [Beatty et al 2001], [Thong 1999], [Iacovou 1995], [Kuan and Chau 2001], [Gibbs et al 2004] and [Zhu et al 2004].

PERCEIVED BENEFITS

Organizations pursue EB adoption with the intention of realizing operational and strategic benefits. [Mehrtens et al 2001] have found that organizations realizing the greater information reach offered by websites, actively adopt the Internet as a communication medium. Direct perceived benefits as discussed in the section earlier and expectation of indirect benefits (customer service, productivity increase), also influence the extent to which organizations adopt EB / EC technologies [Premkumar et al 1994, Crook and Kumar 1998, Kaplan and Sawhney 2000, Beatty et al 2001, Chwelos et al 2001, Mehrtens et al 2001].

External Factors

Pressures from the firm's external environment, competitors' moves and customer expectations have been a major factor influencing the adoption of EB.

ORGANIZATIONAL ENVIRONMENT

Competitive pressures drive an organization to adopt EB [Grover 1993], [Iacovou and Benbasat 1995], [Premkumar and Ramamurthy 1995], [Sohn and Wang 1999] and [Teo et al 2003]. Support and motivation from customers and suppliers, their changing orientation also help organizations to move to EB systems [Grover 1993], [Iacovou and Kumar 1995], [Crook and Kumar 1998], [Hart and Saunders 1998], [Chwelos et al 2001], [Mehrtens et al 2001]. A higher level of consumer readiness (customer willingness and Internet penetration) drives firms to adopt EB [Zhu et al 2003]. Lack of trading partner readiness to engage in Internet transactions is a significant inhibitor for EB adoption. EB intensity of the country [Zhu et al 2003] and industry level [Young and Benamati 2000] factors also act as drivers. [Zhu et al 2004], [Gibbs et al 2004] find legislation barriers, external pressure, government promotion, policy environment and country effects as significant predictors of scope of use of EB technology. [Hart and Saunders 1997, 1998] observe that trust and interdependence between a company and its suppliers

and customers are facilitators for EC adoption.

3. INTERNET ADOPTION BY ORGANIZATIONS: A FRAMEWORK

As we have seen, various classifications of websites have been proposed in the literature. But there is no direct explanation for the differences between them. Most other studies just discuss the intent to adopt EB and the influencing drivers.

Figure 1. below represents a possible framework explaining the phenomenon of Internet adoption. This framework emerges out of our observations.

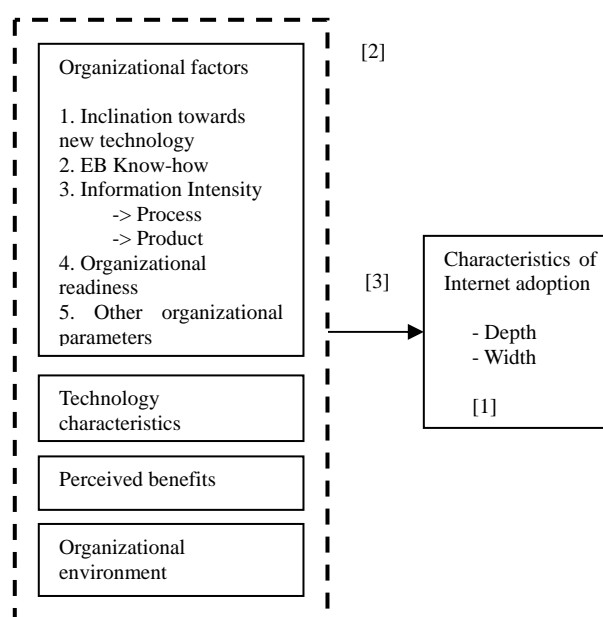


Figure 1. Future research directions

The literature emphasizes the differences in activities that organizations have implemented on the Internet. However, it does not take explicit cognizance of the differences in the involvement of the different stakeholders in the Internet-based business (Refer [1] in Fig.1).

Also, while the literature identifies the individual causal factors in a rather exhaustive manner, it does not explicitly address the nature of their influence on the phenomenon of Internet adoption, their collective influence and the interactions among themselves (Refer [2] in Fig.1).

Information Intensity, particularly along the value system, is a very important determinant of EB adoption but has not been discussed much in EB adoption models (Refer [2] in Fig.1).

Finally, the literature does, very justifiably, try to classify websites, which represents at least partially the degree of Internet adoption. However, the

conceptual linkages between the relevant drivers and the different characteristics of the websites have not been studied in depth (Refer [3] in Fig.1).

4. CONCLUSION

It is observed that there are significant differences in the level of Internet adoption among organizations. Also, often organizations cannot use the Internet as planned or in an effective manner for their business. In this paper we have tried to examine the factors responsible for successful EB adoption and identified gaps in the present literature. Subsequently we have developed a possible framework for explaining the phenomenon of Internet adoption, which also suggests directions for future research efforts. Such analysis would provide organizations an adequate understanding of the factors that would enable them to evaluate the suitability of their organizational environments and their management strategies to their desired levels of Internet adoption.

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