



Conceptualizing Competency in E-Business Adoption

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Abstract

Revolutionary development in Information Communication Technology (ICT) in the past 20 years has impacted individuals as well as businesses in a profound way. Adoption of ICTs in general and Electronic Business (E-Business) in particular leads to decrease in coordination cost, increase in efficiency and facilitates flexibility in Organisations. Therefore E-Business has revolutionized the way business is conducted around the world. There are numerous research studies on E-Business and its related concepts like E-Commerce, E-Services etc, but the studies which demarcate the competency factors for E-Business adoption is not yet interpreted. Therefore the objective of this paper is to conceptualize competence factors that influence E-Business adoption. This study is important and significant in a fact that it will theoretically identify, consolidate, and categorize the competence factor for E-Business adoption.

Keywords: e-business, e-service, e-commerce, competence

1. Introduction

Revolutionary development in Information Communication Technology (ICT) in the past 20 years has impacted individuals as well as businesses in a profound way. Adoption of ICTs in general and E-Business in particular leads to decrease in coordination cost and promotes the efficiency of business process (Damaskopoulos & Evgeniou, 2003). There is new trend that the industries are more and more interested in adopting E-Business technology for their business. The hype that surrounds E-Business development led many proponents to postulate that the future will hold many promises and surprises for both businesses and humanity. In order to survive in the competitive E-Business environment, one need to have an understanding of business, organization, management, socio-economic factors, environmental factors, external factors and most importantly technological dimensions that are crucial for creating awareness of the current E-Business situation and how it is going to be shaped in the future. E-business is a new way of doing business and is an evolution of successful business systems. It enables a more integrated level of collaboration than ever before, bringing added

strength and functionalities throughout the whole value chain in order to deliver products or services and complex projects into an increasingly competitive marketplace. It is a useful tool to eliminate geographical and time restrictions for doing business and explore possibilities for business growth, especially through partnerships (K. Johnston, Shi, Dann, & Barclay, 2006). Web-enabled applications for E-Business are expected to enhance inter-organizational and intra-organizational coordination and improve relationships among business partners. Transaction cost savings and competitive sourcing opportunities are the potential benefits of E-Business. The adoption, use, and value of E-Business have emerged into an active research area in the information systems (IS) discipline (D.W Straub, Hoffman, Weber, & Steinfield, 2002). E-Business adoptions are often not treated as a means to competitive advantage, but as an imperative to cut cost, and streamline major business processes. There are very limited demarcations on the factors that firms should adopt or avoid for successful E-business adoption. Many studies have been conducted that investigate factors affecting E-Business adoption in various sectors. They group these factors in different ways. This study is important and significant in a fact that this study categorize competence factor for E-Business adoptions. The advantage of achieving this objective is to increase the awareness and understanding of E-Business and will be useful in determining the reason for successful E-Business adoption. An extensive literature survey was undertaken to achieve these aims.

2. Review of Literature

Information and Communication Technology (ICT) has been applied across diverse business establishments. The rate of diffusion of technological innovation has been extremely rapid. With the rapid increase in complexity in industrial application of ICTs made way to several developments in industries. During 1990s firms took advantage of the emergence of ICTs and expanded their business globally; until 1980s firms used only in-house technologies (Oyelaran, Oyeyinka, & Lal, 2004). In the case of technological innovation it was observed that (Rogers, 1983, 1995) Innovation Diffusion Theory (IDT) appears to be the most accepted theory for identifying 'perceived' critical characteristics of innovations (Al-Qirim, 2005; Iacovou, Benbasat, & Dexter, 1995; Kaplan, 1999; Karahanna, D Straub, & Chervany, 1999; Moore & Benbasat, 1991, 1996; Premkumar & Roberts, 1999; Thong, 1999). Similarly (Rogers, 1995) characteristics of technological innovations (relative advantage, compatibility, complexity, observability, and trialability) have been hypothesized by different researchers to influence the attitude of potential adopters in a number of studies on E-Business (Al-Qirim, 2005; Moore & Benbasat, 1996; Tornatzky & Klein, 1982).

2.1 Electronic Business

E-business is often associated with supporting business activities by using the Internet to gain certain benefits (Van der veen, 2004). (Kalakota & Robinson, 2001) have defined E-Business as 'the complex fusion of business processes, enterprise applications, and organizational structure necessary to create a high-performance business model' (Al-Qirim, 2007). E-Business is the use of ICT to improve business; for Example from the use of email to facilitation of administrative procedures in buying and selling through the Internet. E-business encompasses application of ICT in all business process such as office automation, production process, coordination with other plants, customer relation management, supply chain management and management of distribution networks (Lal, 2004; Oyelaran et al., 2004). E-business involves the application of web-based information technologies towards automating the business processes, transactions and

workflows and buying and selling products and services using computer networks (Kalakota & Whinston, 1997; Macgregor & Vrazalic, 2005). E-Business methods enable companies to link their internal and external data processing systems more efficiently and flexibly, to work more closely with suppliers and partners, and to better satisfy the needs and expectations of their customers. It is a technology driven process that has the potential to become a major source of competitive advantage for business sources as it is the fast and cost effective way of attracting customers globally and also to compete with the international counterparts. E-business is defined as using the Internet to conduct or support business activities along the value chain (Porter, 2001; Zhu & Kraemer, 2005). (Eze, 2008) defines E-Business as the automation of the entire spectrum of interactions between enterprises and their distributed employees, trading partners, suppliers and customers. E-Business is defined as “a broader definition of EC, not just the buying and selling of goods and services, but also servicing customers, collaborating with business partners, conducting e-learning, and conducting electronic transactions within an organization” (Turban, King, Lee, & Viehland, 2004; Zhuang, 2005). E-Business can be defined as a business process that uses the Internet or other electronic medium as a conduit to fulfill business transactions (Phillips & C. Wright, 2008; Swaminathan & Tayur, 2003). E-Business is a useful tool to eliminate geographical and time restrictions for doing business and explore possibilities for business growth especially through partnerships (K. Johnston et al., 2006).

2.2 Related Concept in E-Business

Most of the literature surveyed (Kalakota & Robinson, 2001; Lal, 2004; Oyelaran et al., 2004) gives a diverse deliberation of E-Business with the help of some related concepts such as E-Commerce and E-Services. We try to discuss the same as theorized by various studies in detail below.

A. *Electronic Commerce (E-Commerce)*

(Laosethakul & Boulton, 2007) Quotes Kofi Annan, the former Secretary General of UN, as stating E-Commerce as one of the most visible examples of the way in which information and communication technology (ICT) can contribute to economic growth. It helps countries improve trade efficiency and facilitates the integration of developing countries into the global economy. It allows business and entrepreneurs to become more competitive. E-Commerce refers generally to all forms of transactions relating to commercial activities, including both organizations and individuals that are based on the processing and transmission of digitized data (Arshad et al., 2008). E-Commerce refers to the use of the Internet for buying and selling activities (Che & Mcqueen, 2008; Rodgers, Yen, & Chou, 2002). It covers processes that touch customers, suppliers, and external partners, including sales, marketing, order taking, delivery, customer service, purchasing of raw materials, and supplies for production and procurement of indirect operating-expense items such as office supplies (Bartels, 2000; Che & Mcqueen, 2008). E-commerce is defined as “the sharing of business information, maintaining business relationships, and conducting business transactions by means of telecommunications networks” (Scupola, 2009; Zwass, 1997). It is the sale or purchase of goods or services between business, government, household, individuals and other public or private organizations, conducted over computer mediated network (Scupola, 2009). Here the goods and services are ordered over the network while the payment is made online or offline.

B. *Electronic Services (E-Services)*

E-services are defined as services that are provided or consumed through the use of Internet-based systems. The consumption or the provision of a service requires the interaction between the service provider and the user, and here it takes place through the intermediation of an Internet-based system and therefore are separated in time and space (Fuglsang & Sundbo, 2006; Scupola, 2008). E-services also include the selling of physical goods on the Internet such as an airline ticket that is purchased online, but delivered by surface mail. E-Services is considered to be services where the Internet is used as a Interface and channel to interact with customers (Baida, Gordijn, & Omelayenko, 2004; Janda, Trocchia, & Gwinner, 2002; Van Riel, Liljander, & Jurriens, 2001). It is the provision of some kinds of services that are substantially differentiated from traditional retailing, such as professional services, entertainment or education (Chea & Luo, 2008) and is an interactive, content-centered and Internet-based customer service, driven by the customer and integrated with related organizational customer support processes and technologies with the goal of strengthening the customer-service provider relationship (Ruyter, Wetzels, & Kleijnen, 2001). This service is offered to customers to support their shopping experience over the internet (Singh, 2002). E-Service is a service delivered by a company to another company through the use of internet or other advanced information and communication technologies (ICT) (Oliveria, 2004). It includes all interactive services that are delivered on the internet using advanced communications, information and multimedia technologies (Oliveria, 2004; Roth, 2001). It uses electronic networks and associated technologies to enable improve, enhance, transform or invent a business process or business systems to create a superior value for current or potential customers (Oliveria, 2004; Sawhney & Zabin, 2001). It is the service in a virtual environment referred to as delivery of service using new media such as web (Oliveria, 2004; Voss, 2003).

2.3 E-Business Adoption

The majority of the literature surveyed revealed that the driving force behind adoption of E-Business has been opportunities for growth and the need to keep up with competition. Adoption can be defined as “the decision to make full use of an innovation as the best course of action available” (Rogers, 1995; Scupola, 2008). E-business adoption is measured by listing which business activities are electronically supported (activity), which ICT applications are used (application) and the value it has for the business (value creation) (Van der veen, 2004). In his study (Van der veen, 2004) also verifies two things, firstly, E-Business adoption can improve the efficiency and effectiveness of the existing organization; secondly E-Business adoption can offer the possibility to introduce new products or services. The increased competition among the industry sectors lead to modernization and hence E-business adoption (Tarafdar & Vaidya, 2004). There are different factors that influence the adoption of innovations or technologies for E- business and the factors differ depending on the time in which technology has been used. It also depends on the type of technology and type of the firm adopting it and also on the location of the firm. E-business adoption is the application of certain ICT technologies to support business activities in a way that creates value. When considering adoption, the adopter needs to assess in what way ICT technologies are beneficial to the organization. There are two levels of adoption. Initially, innovation must be purchased, adopted and acquired by an organization. Subsequently, it must be accepted by the ultimate users in that organization also called implementation (Chong & Bauer, 2000; Rogers, 1995; Scupola, 2009) In order to differentiate between adopters and non-adopters (Al-Qirim , 2007) categorized them into three clusters of adoption: starters(the

adoption of the Internet and external email), Innovators or adopters (the adoption of any of the EC Infrastructure technologies (ECIT): Intranet, Extranet, Internet-EDI and websites) and extended adopters or innovators (the adoption of more than one ECIT was dependent on organization size, compatibility, CEO's innovativeness, support from technology vendors, and competition.). An organization moves through the adoption process multiple times, each time to reach the next level of the innovation. At first the company may present itself to the customers through e-commerce websites, and then may add some interactive features to attract the customers, next it may include a transaction function for standard products or services, and finally the site may be fully integrated with internal systems (Brand & Huizingh, 2008; Teo & Pian, 2004). Further expansions of e-commerce activities are thus considered as additional adoptions at subsequent levels of e-commerce innovation (Brand & Huizingh, 2008).

2.3.1 Types of E-Business Adoption

Based on the parties involved in the business transaction and various types of trading partners, E-Business can be divided into the following types (C. Lee et al., 2007; Teo & Ranganathan, 2004):

A. Business-to-Business (B2B)

Business-to Business (B2B) involves the buying and selling of products and services among businesses. Companies doing business with each other such as manufacturers selling to distributors and wholesalers selling to retailers. Pricing is based on quantity of order and is often negotiable. The B2B activities include online purchase or procurement between customer and supplier, such as supply chain management (SCM) and enterprise resource planning (ERP) systems. They are comprised of back-office systems. (Eg. Metro, EClerx,).

B. Business-to-Consumer (B2C)

Business-to-Consumer (B2C) implies sale of products and services to individuals, i.e., Business that sells products or provides services to end-user consumers. Businesses selling to the general public typically through catalogs utilizing shopping cart software. B2C e-commerce refers specifically to the activity in which consumers buy products or services using the Internet medium (I. Brown & Jayakody, 2008). The B2C activities include consumer's online inventory tracking before ordering a product. An example of the B2C e-business application is customer relationship management (CRM) and it is comprised of the front-office system. (Eg. Amazon, Google, Naukri)

C. Consumer-to-Consumer (C2C)

Consumer-to-Consumer (C2C) means to sell directly to other consumers. There are many sites offering free classifieds, auctions, and forums where individuals can buy and sell. The consumer lists items for sale with a commercial auction site. Other consumers access the site and place bids on the items. The site then provides a connection between the seller and buyer to complete the transaction. There are online payment systems like PayPal where people can send and receive money online with ease. EBay's auction service is a great example of where person-to-person transactions take place every day since 1995. (E.g. E-Bay)

D. Business-to-Government (B2G)

Business-to-Government (B2G) calls for Government to buy or provide goods, services or information to/from businesses or individual citizens. Actively drive E-transactions initiatives such as e-procurement and the development of an electronic

marketplace for government purchases; and carry out government procurement tenders through electronic means for sale of goods and services (Fang, 2002). It includes various taxes, forms and statistics; tendering for government projects and procurement, goods and services; public private partnership building (E.g. E-Taxpaying, E- Billing)

E. Business-to-Employee (B2E)

Business to Employee (B2E) is growing in use. This form is more commonly known as an 'Intranet'. An intranet is a web site developed to provide employees of an organization with information. The intranet is usually accessed through the organizations network, it can and is often extended to an Extranet which uses the Internet. Information and services made available to employees online. Companies using internal networks to offer their employees products and services online--not necessarily online on the Web--are engaging in B2E form. (E.g.: Intranet Portal with Email)

3. Discussions and Findings

A critical assumption of earlier studies for e.g., (Phillips, 2003; Phillips & C. Wright, 2008) is that e-business encompasses e-commerce, and goes far beyond e-commerce to include the application of information technologies for internal business processes as well for the activities in which a company engages in commercial activity with suppliers and customers. These internal activities can include functional activities, such as marketing, accounting, human resource, and operations. The main difference between E-Commerce and E-Business is that E-Commerce defines interaction between organizations and their customers, clients, or constituents which includes mainly buying or selling with financial transactions. E-Business is broader term that includes E-Commerce and also encompasses an organization's internal operations and various other E-Services. E-business can improve business efficiency and staff productivity within organizations and can decrease transaction costs and facilitate firms' coordination with business partners. Most of study surveyed shows the analyses of both causes and consequences of E-Business Adoption in selected firms or sectors, controlled by size of operation and mix of products. Given the paucity of such studies in term of competency model, we would like find out and suggest a pattern of competence factors for E-business adoption. The concept of competence has been much discussed in different types of research such as management, human resources and information systems and there is much confusion regarding the definition of competence. Furthermore, the concept of competence has been used at different analytical levels: for example, task-specific competences, firm specific competences or industry specific competences (Nordhaug, 1998). Competence has often also been identified with performance. However, a large amount of literature distinguishes between competence and performance, especially in relation to competence as a specific skill. (Marcolin, Compeau, Munro, & Huff, 2000) define user competence as "the user's potential to apply technology to its fullest possible extent so as to maximize the users' performance on specific job tasks." Competence is also seen as a personality trait, and might include generic knowledge, motivation, social role, or skill of a person linked to superior performance on the job (Haynes, 1979). Competence has also been associated with knowledge, and in this view competence is not only task specific, but embodies the ability to transfer knowledge across tasks, thus becoming interactive and dynamic (R. Brown, 1994). In human capital theory, the concept of competence has been related to specific firm technologies and to the execution of tasks that are related to the technology and the routines required to use that technology. Furthermore, there are many different typologies of competences found in the literature. For example, (Yukl, 1989) develops a

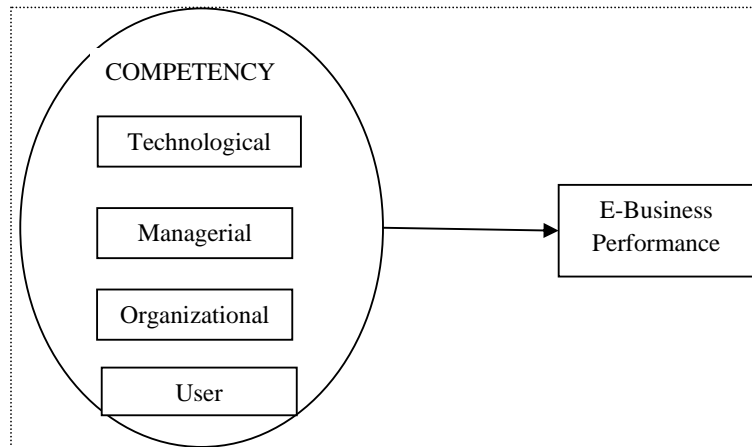
typology that consists of technical, conceptual and interpersonal competences. Technical skills or competences represent knowledge about methods, techniques and processes required to conduct a specific activity and the ability to use the tools and equipment necessary to explicate that activity. Interpersonal skills include knowledge about social skills, the ability to communicate, and the ability to cooperate, as well as empathy. Finally, conceptual skills include creativity, efficiency in problem solving, analytical capability and capacity to understand opportunities and problems. This study tries to consolidate various items categorizing it in to factors or variable with appropriate description as below (see table 1).

Table 1 : Competence Factors for E-Business

Variable	Item	Description	Source
Technological Competence	Technological collaboration; Infrastructure, Cost of new infrastructure; Technological competency- technology infrastructure and IT human resources; Technology investment cost; Adoptability of technology infrastructures; IT engagement and collaboration; Technological innovation and integration; Investments for supply chain system; Systems compatibility	The degree of Technological ability achieved for Effective E-Business adoption.	(Oyelaran et al., 2004; D. Johnston & L. Wright, 2004; Zhu & Kraemer, 2005; Al-Hajri & Tatnall, 2008; Keoy et al., 2007)
Managerial Competence	Academic qualification of managing directors; Time to implement projects ; Lack of upper mgmt support/ direction/ planning/ Organization inertia; Dearth of Skilled hiring; Bad experiences in the past ; Regulatory barriers; regulatory support ; Effectively enables the firm to manage its market interactions [its vision and goals, electronic market orientation and relations with other market players]	The degree of Managerial Capability attained for Effective E-Business adoption.	(Oyelaran et al., 2004; D. Johnston & L. Wright, 2004; Zhu & Kraemer, 2005; K. Johnston et al., 2006)
Organizational Competence	Size of operation; knowledge base; National culture; External pressures; Availability of resources; Organizational culture; International scope; Financial commitment; Organizational learning factors; Organizational support and value; Organizational knowledge management; Organizational structure	The level of Organizational fitness accomplished for effective E-Business adoption	(Oyelaran et al., 2004; D. Johnston & L. Wright, 2004; Al-Hajri & Tatnall, 2008; Keoy et al., 2007)
User Competence	Learning process; Perceived benefits; Perceived Risks; Trust; Customer Relationship [customer trust, commitment, satisfaction]; Ease of use[easy to navigate, learn, manage]; Perceived ease of use; (Easy to navigate, awareness/ knowledge about Internet technology and accessibility of services); Customer trust (Internet security); Customer commitment; Customer loyalty Readiness mindset of adoption	The characteristics of user required for best E-business Performance.	(Oyelaran et al., 2004; Al-Hajri & Tatnall, 2008; Keoy et al., 2007; K. Johnston et al., 2006)
Performance	export performance; profitability; value addition; skill intensity; internal competition ; Efficiency; Ability to create partnership; Performance measurement Organizational performances [profitability, market environment, employee productivity]; Increased levels of quality and service; Improved profitability	The state of E-Business effectiveness reached by an organisation.	(Oyelaran et al., 2004; K. Johnston et al., 2006; Al-Hajri & Tatnall, 2008; Keoy et al., 2007)

After going through the literature relating to the concept of E-business adoption, it has been observed that there were several noticeable gaps which can be summarized like this. The successful adoption of e-business can be achieved by developing a set of e-business competencies and investigating the significant relationships of those factors on its performance. This study has also taken consideration of the elements, namely technological, managerial organizational and user perspectives on business performance. There is limited understanding of the competence involved in E-Business adoption and consequently of E-Business performance. Therefore based on the observation of various studies in the purview of factor adopting E-Business, our study sought to narrow down the identified gaps and suggest four major competences to achieve the best E-Business performance (See Figure 1).

Figure 1 : E-Business adoption: A Conceptual Competency Framework



The technology factors describe the external and internal technology relevant to the firm, which includes existing technologies in the firm and those technologies available in the market. Organization factors define the size, scope and the management structure: the quality of human resources, risk taking ability, management policies and support and available slack resources. Technological competence is the ability of companies to understand, use and exploit relevant state of the art technology internally (Walsh and Linton, 2001), Managerial competence is defined as set of skills or behaviors required to execute the E-Business adoption effectively (Erondu & Sharland, 2002). The technological dimension provides the shared establishment of the technological capabilities for building business applications. This comprises of technological components and a group of services such as collaboration, communication, learning, promotion and process control. The organizational dimension can be defined as the choice pertaining to the particular configurations and internal arrangements intended to support the organization's chosen position in the market. Organizational competence and technological innovation are crucial to business success in this digital era. Along with technological and organizational perspective, managerial issues also calls for special attention when taking decisions towards e-business strategy. While Performance measures are regarded as having a strong impact on e-business success, user issues must be addressed in the process of E-Business adoption both with inside and outside of the firm.

4. Conclusion

Recent advances in information and communication technologies (ICTs) are giving organizations a new competitive edge. Researchers related the growing impact of ICTs

on organizations' performance to the surge in Internet use and the adoption of E-Business. The globalization of organizations facilitated by the advent of telecommunications and Internet technologies has promoted adoption of E-Business by firms. The best practices of E-Business are revolutionizing not just technology itself but the whole process through which services are provided. This study helps better understand E-Business and identifies various competence factors like technological, managerial, organizational, user and its performance for E-Business adoption. This study would provide researchers to do an empirical examination on the identified factors of E-Business with its performance. This study would also help managers decide to what extent their organizations should invest in E-Business by matching the E-Business attributes to their own organization's characteristics. To adopt appropriate technology for e-business and to support greater participation in E-business adoption, firms must develop the business planning, skills to identify, select, and implement the appropriate supporting technology. Our investigation of E-Business adoption factors may help both researcher and potential adopters.

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