

Factors Affecting Adoption of E-Commerce in Small and Medium Enterprises in India

Moumita Dey and Dr. Bimal Deb Nath

Research Scholar, Department of Management, NEHU Tura Campus, Meghalaya (India) Assistant Professor, Department of Management, NEHU Tura Campus, Meghalaya (India)

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Abstract:

A large number of Small and Medium Enterprises (SMEs)in developing countries are unapprised of the enormous benefits offered by E-commerce primarily due to lack of awareness, knowledge and exposure to Information Technology(IT). Despite enormous latent potentialities of E-commerce, there has been no significant progress in these areas in developing counties particularly India. This paper addresses this issue by understanding the factors affecting adoption of E-commerce in SMEs of India. Initially, variables responsible for E-commerce adoption were identified from relevant IT (Information Technology) adoption theories, models and studies and then based on these variables, structured questionnaire was designed. Finally, an exploratory factor analysis was employed on collected data to investigate the major factors affecting E-commerce adoption in India. The findings of the study highlighted some major barriers which need to minimized and influencing factors which need to promoted by SMEs and encouraged by concerned decision makers, government agencies, policy makers for smooth adoption of Ecommerce.

Keywords: Small and Medium Enterprises, Information Technology, E-commerce, Developing countries, India and E-commerce..

I. INTRODUCTION

In the recent economic globalization, organization including SMEs have seen in comparable advancement with the E-commerce adoption, which has made business processes easier, flexible and time saving (Alshehri et.al. 2012). SMEs have seen a drastic change with the implementation of E-commerce in its business environment. The adoption of E-commerce among SMEs in developing nations started to recognize the potential of E-commerce and realized that its' adoption and implementation could play an important role in growth for their business. But, still a large number of SMEs in these countries are uninformed of the potential advantages of E-commerce mainly due to lack of awareness to IT products and services and the Ecommerce system as a whole. Despite enormous latent potentialities for setting up of various resource-based enterprises, so far, there has been no significant progress in these enterprises and therefore many of the these SMEs should pay attention to IT innovation. It is the right time for SMEs to adopt E-commerce technology to get an edge in the competitive market and subsequently play an important roles towards the growth and development of a region as well as nation (Bernadas & Verville, 2005).In this backdrop, the present study tries to examine to different barriers and influencing factors in adopting Ecommerce in SMEs in India.

II. THE LITERATURE REVIEW

Benefits of E-commerce and level of adoption of E-commerce:

E-commerce has been prospering in the developed countries and is playing a significant role in national economies. Unlike traditional commerce that is carried out physically, E-commerce reduced physical work and save time (Karake-Shalhoub, et al.,2007).Recently, E-commerce has taken a great leap in the world of computer with the use of the Internet and other networking technologies(Turban et al., 2008).The E-commerce is not just conducting business online but t it also engages a mass activity such as promotion of product or services on the web, integrating invoicing as well as payment from customers, secure transactions plus handling consumer queries and feedback online (Sadeh, 2003).

E-commerce refers usually to the entire forms of transactions describing to business-related activities,



including both businesses and individuals that are based upon the processing and communication of digitized records(Vaithianathan, 2010).It promises a number of benefits, starting from reduced cost and expenses to improved accuracy to transformative benefits and allows the business process engineering such as steady replenishment, and speedy response to a transaction(Molla and Licker, 2005).

In developing nation including India, largely these SMEs are very vibrant and active sector in contributing to the national economies (Tan et al., 2007). The adoption rate of E-commerce in these enterprises are very low mainly due to certain barriers such as lack of trust and knowledge about the E-commerce technologies, languages and culture of the people. Eventually, these barriers vary region wise and creates a gap in the adoption of E-commerce in diversified India. On the other hand, the factors that drive the improves the adoption rate of E-commerce are information communication technology (ICT) infrastructures along with the adoption of computers and development of Internet broadband, accessibility of online services such as online payment services, policy and legislations and safety (Saxena, et. al., 2014).

Theories explaining E-commerce Adoption:

There are several theories used in information system (IS) research on the subject of technology adoption. The largely used theories are the technology acceptance model (TAM)(Davis et al. ,1989), theory of planned behaviour (TPB) (Ajzen, 1985, Ajzen, 1991), unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al. 2003), Diffusion of Innovations (DOI) (Rogers, 1995), and the Technology-Organisation-Environment (TOE) framework (Tornatzky and Fleischer 1990). Popularly used models and framework which are highly in used are Innovation Diffusion Model (DOI), Technology Acceptance Model (TAM), Theory of Planned Behaviour (TPB), Perceived e-Readiness Model (Tan et. al. ,2007), and Technological, Organisational and Environmental Framework (TOE). Most of these models and framework have not given a specific description regarding its occurrence and use in E-commerce technology adoption. However. Technology-Organisation-Environment (TOE) framework is found suitable for organization level. Another reason for use of TOE in technology adoption studies is that it comes with a self-explanatory power from different perspectives of

environment, organization or individual characteristics viewpoint. Hence, TOE framework is not biased as it views all context of technology-organisationenvironment, unlike the conservative theories which are focused on technological characteristics only, where else, it does not provide a clear explanation regarding the other factors which internally and externally is associated with the organization and its technology adoption.

Several researchers (Kuan and Chau, 2001;Oliveira and Martins, 2010) used only the TOE framework to understand different IT adoptions and confirmed that TOE identifies the decision to adopt a technological expansion on the basis of factors in the organizational perspectives and environmental perspectives, as well as features of the technology itself. In due course, TOE framework becomes better capable to describe the intrafirm IT adoption than other.

Factors affecting SMEs to E-commerce Adoption:

Many studies (Nathan, 2009; Zaied 2012; Kumar & Maan 2014; Pradas et. al., 2013;El-fitouri, 2015)have highlighted the factors affecting E-commerce adoption in SMEs. and these could be identified as potential discriminators and grouped into following categories: organizational, technological and environmental characteristics. Organizational characteristics included support of top level managers and IT skills. The technology factor wasperceived direct and indirect benefits, online data access and the Internet. While environmental characteristics variable, considering competitive pressure, external pressure, external support and vertical linkages were considered. Besides these, the other relevant factors were the initiative of top management, compatibility of E-commercein the company, perceived relative advantage perceived from Ecommerce, and knowledge of the company's employees about computers.

In a nutshell, none of theories and models did not provide clear evidence about the internal and external factors which affect IT adoption in any organization. On the other hand, thesetheories witnessed that for multifaceted new technology adoption such as Ecommerce, it is important to cartel more than one theoretical model to succeed a better understanding of the IT andE-commerceadoption. Subsequently various empirical studies also tried to address this issue but failed to provide a comprehensive account of the factors underlying the adoption of IT in general and E-commerce



in particular.It is in this locale, this paper addresses this issue and tries to fill the gap in this research.

Further, it is observed that for more complex new technology adoption such as E-commerce, it is important to combine more than one theoretical model to achieve a better understanding of the IT adoption. Therefore, in this study, technological, organizational, and environmental contexts are taken into account, as well as, other regional factors are also considered that affect SMEs in adoption of E-commerce.

Barriers to E-commerce Adoption in SMEs:

Several researchers (Sahay & Avgerou, 2002; Harbi, et al., 2009; Scupola, 2003) observed that there are few major obstacles which are resulting in low adoption rate. In developing countries these obstacles are organisational, technological, environmental, economic, social and political. Technological barrier are application security, lack of information technology (TT)infrastructure(Kenneth, et.al, 2012). Organizational barrier are financial cost(Cooley and Quadrini, 2001; Cabrai and Mata, 2003), IT training program(Morris, 1988-1989; Paxton & Turner, 1984), Uncertainty and risk (Teo, 2007; Tan, et al., 2007), Cost of internet connectivity (Kwadwo et al., 2016), Satisfaction with the existing system (Zaied, 2012), Lack of understanding and trading partner readiness (Mehrtens et al., 2001), lack of knowledge(Damanpour, 1996), lack of technological and Laudon. 2011).lack of support (Laudon experience(Bingi, et. al. 2000;Hunaiti al. et 2009), computer anxiety (Chua et al., 1999), lack of internet and power connectivity (Lawrence and Tar, 2010), trading license (Hidayat, 2004) and geographical location.

There are a number of technical and non-technical curbs accompanying with E-commerce that limit or restrict SMEs to adopt information technology and Ecommerce indeveloping countries in general and India in particular. Many of theseSMEs can't cope with these obstacles in technical, economic and legal barriers and need other support such as public, private and motivational. Considering the above discussion following examine the barriers of E-commerce adoption in the context of SMEs in India.

Research Question1: Which are the major barriers to E-Commerce Adoption for SMEs in India?

Influential Factors for E-Commerce Adoption:

SMEs are capable to acquire advantage of the opportunities open by the internet and E-commerce to reach out to the global market. However, review of several studies (Zhu and Kraemer, 2005; Zhu, et.al., 2006; Zaied,2012) and various technology adoption models such as TOE, DOI, TAM and UTAUT suggested few factors which can influence E-commerce adoption. These factors can be divided into 1) Technological context- (a) perceive direct and indirect benefit, (b) ebusiness know how 2) Organizational context- (a) firm size, (b) market scopes, (c)organizational readiness (d) top management support, 3) Environmental context- (a) external pressure, (b) government interventions, (c) facilitating/enabling conditions 4) Regional context- (a) positive attitude and intension, (b) social system, (c) earlier adopters, (d) perceived usefulness, (e) perceived ease of use, (f) actual ICT usage, (g) distribution channel.

However, these factors might vary among developing countries and subsequently research question is framed in the context of SMEs of India to dig into the major influencing factors for India.

Research Question 2: Which are the major Technological, Organizational, Environmental and Regional factors that influence E-commerce adoption decision in SMEs of India.

III. RESEARCH METHODOLOGY:

The units for this study are mainly of SMEs of India that are registered with the District Industries Centers (DICs) and Micro, Small and Medium Enterprises (MSME) of different states of India and thus the population of the study comprises all SMEs of India. To ensure that the research population was enough representative, initially 20 districts and then 100 SMEs as sample units from these districts are selected according to convenience sampling and convenience of the researcher. The respondents included owners or managers of the sample enterprises. One representative was considered as sample respondents for each enterprise. The respondents approached via email and also via telephone to ensure a high response ¬¬¬rate. A survey research questionnaire approach is selected to gather the data for this paper. The questionnaire was mainly categorized into two sections. In the first section basic information of the respondents was asked and in the next section sought organization details of the respondents and on their views of the different relevant constructs of the research are such as



use of E-commerce application, benefit and barriers and all variables were measured with multiple questions using a five point Likert scale.

IV. RESULTS AND DISCUSSIONS:

The key focus of this research was to identify barriers and influencing factors among the SMEs in India. To achieve the first research, question a factor analysis was employed to shrink the seventeen variables (barriers) to only few numbers of significant barriers. The varimax rotation of the factor analysis indicated (Table 1.1.) important barriers in E-commerce adoption are application security, financial cost and satisfaction with existing system and information technology training and the least importance barriers are power connectivity and geographical location. These obstacles are resulting in low adoption rate, which was also indicated by previous studies (Cooley and Quadrini, 2001; Cabrai and Mata, 2003) and therefore, to increase the E-commerce adoption rate these obstacles should be minimized by availing appropriate environment to encourage its use.

			Table 1.2: Ranking of Barriers variables:			
Table 1.1: Factor Loading on Barriers Variables		Barriers Variables	Mean	SD*	Rank	
Barriers Variables	Factor	Proportion	Security	3.52	1.55	1
	loading	Variance	Financial Cost	3.41	1.61	2
Security	0.872		Satisfaction with Existing	3.40	1.39	3
Lack of Information	<mark>-0.019</mark>	==	System			
Technology		0.677	Information Technology	3.40	1.57	4
Financial Cost	0.901		Training			
Satisfaction with	0.890		Cost of Internet connectivity	3.39	1.43	5
Existing System				2.20	1.50	
Information Technology	0.908		Uncertainty	3.38	1.53	6
Training			Lack of understanding	3.38	1.43	7
Cost of Internet	0.654		Trading partner readiness	3.24	1.37	8
connectivity			Lack of Knowledge	3.22	1.40	9
Uncertainty	0.745		Lack of technological support	3.16	1.40	10
Lack of understanding	0.718		Lack of Experience	3.10	1.38	11
Trading partner	0.710		Computer anxiety	3.10	1.42	12
readiness			Lack of internet connectivity	3.08	1.47	13
Lack of Knowledge	0.900		Trading license	3.08	1.46	14
Lack of technological	0.870		Power connectivity	2.87	1.65	15
support			Geographical Location	2.82	1.62	16
Lack of Experience	0.873					
Computer anxiety	0.867		*SD denotes Standard Deviation	n		
Lack of internet	0.820					
connectivity			To answer the second	research	questi	on, an
Trading license	0.868		exploratory factor analysis was also conducted to identify			
Power connectivity	0.959		the significant influencing variables in SMEs of India.			

that factor loading of the only variable i.e. 'Lack of information technology' was low and eventually eliminated for the study. The variables found significant for the study are cyber security, huge financial cost, satisfaction with the existing system, lack of IT training, cost of connectivity, uncertainty, lack of understanding, trading partners readiness, lack of knowledge, lack of technological support, lack of experience, computer anxiety, lack of internet connectivity, trading license, power connectivity and geographical location. Finally, ranking of the variables (Table 1.2) revealed that the most

0.944

Geographical Location

Table 1.3: Factor loading for influencing factor

component was found statistically considerable as factor

The factor analysis (Table 1.3) was carried out to group the variables into three components for manufacturing.

However, in case of manufacturing sector only single

loadings of all other

Influencing variables	Factor 1	Factor 2	Factor 2
Direct and Indirect benefits	0.837	<mark>0.081</mark>	<mark>0.027</mark>
E-Business	0.837	<mark>0.193</mark>	<mark>-0.044</mark>
Firm Size	0.824	<mark>0.129</mark>	<mark>0.010</mark>
Global Market	0.937	<mark>-0.025</mark>	<mark>-0.135</mark>

Organization Readiness	0.778	<mark>0.166</mark>	<mark>-0.004</mark>
Top Management Support	0.963	<mark>-0.114</mark>	<mark>-0.114</mark>
Govt . Intervention	0.944	<mark>0.024</mark>	<mark>-0.074</mark>
Facilitating Condition	0.848	<mark>-0.017</mark>	<mark>0.077</mark>
Positive Attitude	<mark>0.228</mark>	<mark>0.123</mark>	<mark>0.422</mark>
Social System	0.862	<mark>-0.045</mark>	<mark>0.046</mark>
Early Adopter	0.816	-0.021	<mark>0.102</mark>
Perceived usefulness	0.817 -	<mark>-0.065</mark>	<mark>0.183</mark>
Perceived Ease of use	0.823	<mark>-0.120</mark>	<mark>0.151</mark>
ICT usage	0.503	-0.101	<mark>0.103</mark>
Distribution channel	0.506	<mark>-0.069</mark>	<mark>0.026</mark>

variables for factor 2 and 3 were low. The ranking of the variables(Table 1.4) revealed that the most important influencing variable are organization readiness, ICT usage, distribution channel, firm size, govt. intervention,

direct and indirect benefits, facilitating condition, social system, top management support and E-business, early adoption, Perceived usefulness, and the least significant variables global market and Perceived ease of use.

The study suggests that there is a need for a sociotechnical approach in supporting an environment where SMEs can adopt E-commerce and obtain the benefits from it. The outcome also suggests a clear policy on SMEs that will enable them to adopt E-commerce technologies. There is also urgent necessity for minimizing the barrier particularly inadequate infrastructure for installation and setting up application security software's, low budget for up gradation of the firms, unskilled manpower and etc. Further concerned government agencies and decision makers should take

	Table: 1.4: Ranking of Int	fluencing fa	ctors	
Influencing Factors	N	Manufacturing		
	Mean	SD*	Rank	
Organization Readiness	3.66	1.39	1	
ICT usage	3.65	3.47	2	
Distribution Channel	3.58	2.93	3	
Firm Size	3.57	1.51	4	
Govt. intervention	3.55	1.56	5	
Direct and indirect benefits	3.52	1.55	6	
Facilitating condition	3.51	1.46	7	
Social system	3.50	1.43	8	
Top Management Support	3.48	1.54	9	
E – business	3.48	1.55	10	
Early adopter	3.45	1.45	11	
Perceived usefulness	3.40	1.44	12	
Global Market	3.35	1.47	13	
Perceived ease of use	3.34	1.48	14	

*SD denotes Standard Deviation

necessary steps in preparing organization readiness, encouraging ICT usage and promoting distribution for Ecommerce adoption. It is also crucially important for SMEs to improve their efficiency for further adoption of E-commerce. With that clear purpose, the following may be observed or suggested a) The top management of SMEs need to improve their awareness toward Ecommerce Adoption. b) A more flexible and adaptable organizational innovative culture should be advocated among SMEs. c) Concerned Government should initiate in implementing policies toward adoption of Ecommerce.

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