

Regional Challenges affecting ICT adoption and operational performance of Small and Medium Enterprises: an Empirical Evidence in North Eastern Regions of India.

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Abstract

The purpose of this study is to gain a deep understanding of the challenging factors that affected the adoption and usage of ICT by SMEs in **North Eastern Regions of India**. The prior studies believed that Internal and external challenging factors are affecting ICT adoption. Accordingly, the study considered characteristics such as technology, organization, and managerial attitude as internal factors in adopting ICT whereas regional factors are the external factors. This study provides a greater understanding of SMEs' perception of barriers to ICT adoption and its impact on the Operational performance (performance of business processes) of the SMEs of North East India. The study conducted the Structural Equation Modelling (SEM) analysis to examine and establish the relationship between exogenous variables such as technology, organization, environmental and regional; endogenous variables such as managerial attitude, ICT adoption, and operational performance. The results of the study would be helpful for SMEs, and policymakers particularly the Government in supporting and overcoming these barriers and eventually promoting the organizational performance of SMEs in the region.

Keywords: Challenging factor, ICT adoption, SEM, North Eastern Region and SMEs

1. Introduction:

The competitive nature of business requires that organizations, especially SMEs (Small and Medium Enterprises), develop and sustain any possible competitive advantage. Increasingly, this requires that the tools of Information Technology (IT) don't just enable electronic transactions to occur, but also transform internal systems and help build relationships with customers. ICT provides substantial benefits to businesses by improving efficiencies and raising revenue. It helps the business by reducing costs, growing market perspective, and providing newer trade opportunities (Beck, Wigand, & Konig, 2005; Grandon & Pearson, 2004). The adoption of ICT among SMEs in India vis-a-vis other countries SMEs have begun to recognize the potential of ICT and understand that its adoption could play a major role in enabling growth for their business, both in domestic and international markets.

North Eastern region of India is currently dominated by small and medium enterprises and these SMEs are facing huge challenges in operation, technological up-gradation, ability to access institutional credit, and intense competition in marketing. These challenges can be overcome by the adoption of ICT, which not only reduces the cost of production and increase productivity, but also attracts new customers, improves customer responsiveness, and opens new markets on a global scale. However, the rates of adoption of ICT by SMEs in comparison with large organizations are slow. However, the less complex structures of smaller organizations make them more flexible and easier to fit with the ICT application (Al-Qirim, 2004). Usually, it is seen that the focus of ICT adoption is based on two aspects, like the barriers and influencing factors. The present study attempts to investigate these factors in the context of the North Eastern Region of India in general particularly Assam being the largest state in northeast India.

Most of the empirical research is based on large companies, and SMEs are characterized by a lack of knowledge about the real advantages of ICT. This paper aims to investigate the factors that affect ICT adoption by small and medium enterprises. A variety of internal and external factors have been identified as preventing many SMEs from implementing ICT. After the discussion of ICT usage, a conclusion is drawn along with significant recommendations to improve ICT utilization amongst SMEs. The article is structured as follows. Section 1 is the introduction. Section 2 presents a literature review of ICT adoption in SMEs. Section 3 presents the conceptual framework of this study. The methodology is presented in section 4. Section 5 presents an analysis of the results, and limitations and finally discusses some conclusions.

2. ICT Adoption in Small and Medium Enterprises (SMEs)

SMEs in the past were limited from participating in the technological revolution because of the cost and personal limitations. With time SMEs also evolved in technology infrastructure, as most of the SMEs already have adopted IT infrastructure. SMEs are seen to have adopted innovations and opportunities quicker than large firms (Lomerson, 2004). A developing country like India becomes up-to-date and industrial if it applies information technology to boost production as well as increase international competition. In India, the internet has become stable and powerful with the prompt escalation of ICT, which consequently plays a significant part in the 21st Generation intended for the new prospect that will certainly open an expansion in both small and medium enterprises. But this is not the case with backward regions such as the Northeastern part of India. However, SMEs not only developed and industrialized rural and backward areas but also provided employment opportunities for rural populations with low capital costs, contributing to the socio-economic development of the country. The region is lagging in the adoption of ICT in SMEs because of certain barriers. These barriers vary region-wise and create a gap in the adoption of ICT among SMEs in diversified India. The factors that affect the adoption of ICT are mainly infrastructure along with the adoption of computers and development of Internet broadband, accessibility of online services such as online payment services, policy and legislation, and safety (Saxena, et. al., 2014).

Theories explaining ICT 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 Davis et al. 1989), the theory of planned behavior (TPB) (Ajzen, 1991), the unified theory of acceptance

and use of technology (UTAUT) (Venkatesh et al. 2003), Diffusion of Innovations (DOI) (Rogers1995), and the Technology-Organisation-Environment (TOE) framework (Tornatzky and Fleischer 1990). Eminent scholars also adopted various models and frameworks as a foundation to examine Technology adoption and E-Commerce adoption process. Popularly used models and frameworks are highly in used are Innovation Diffusion Model (DOI), Technology Acceptance Model (TAM), Theory of Planned Behaviour (TPB), Perceived e-readiness Model (Tan, Tyler, and Manica 2007), and Technological, Organisational, and Environmental Framework (TOE). Most of these models and frameworks have not given a specific description regarding their occurrence and use in technology adoption. On the other hand, models and frameworks like the Perceived e-Readiness Model (PRM), Technology-Organisation-Environment (TOE), and Unified Theory of Acceptance and Use of Technology (UTAUT) have their drawbacks that influence organizational readiness with other external factors. However, the Technology-Organisation-Environment (TOE) framework is found suitable for the organization level. TOE framework sets an identical consistency with the theory of Diffusion of Innovation (DOI) framework (Roger, 1995). Another reason for the 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, the TOE framework is not biased as it views all contexts of technology-organization-environment, unlike the conservative theories such as the Diffusion of Innovation (DOI) or Technology Acceptance Model (TAM) which are focused and emphasize 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.

Factors Affecting SMEs to ICT Adoption:

Many studies (Nathan, 2009; Johnson, 2012; Zaied 2012; Kumar &Maan 2014; Pradas et. al., 2013; Alshehri et.al., 2012; El-fitouri, 2015)have attempted to describe the factors affecting ICT adoption in SMEs. These studies did not give clear evidence on how the interaction of internal and external factors can influence the organization's adoption of ICT and its implementation level. The majority of these studies have failed to give a complete account of the factors underlying the adoption of IT innovation behavior in general. Further, it is observed that for more complex new technology adoption, it is important to combine more than one theoretical model to achieve a better understanding of IT adoption. Therefore, in this study, in addition to taking into account technological, organizational, and environmental contexts, the other regional factors are also considered that affect SMEs in the adoption of ICT.

3. The conceptual framework for the study

The conceptual model tested in this paper contains constructs that have demonstrated theoretical support, based on several researches done in this area in different developed and developing countries, particularly on ICT and other innovation perspectives. The model examines the factors that would possibly affect ICT adoption and tries to frame hypotheses based on the previous studies which form the basis of the study.

Challenges to ICT Adoption in SMEs:

Several researchers (Sahay & Avgerou, 2002; Harbi, et al., 2009; Al-Qirim & Corbit, 2002) observed that there are some major obstacles which are resulting in low adoption rates and these obstacles are mainly organizational, technological, environmental, and regional.

Technological barrier:

Technologies challenges that are affecting ICT adoption are a) Application security and b) Lack of information technology (IT) infrastructure. ICT security is principles that safeguard data-related transactions. Security is an essential part of any e-business and compromise cannot be made on the part of payment/transaction. Thus, ICT application security is a vital consideration for ICT adoption. (reference). In addition, a sound infrastructure and maintained technological support lead to a positive environment for adoption (**Kenneth, et.al, 2012**). Thus the availability of technological infrastructure shapes the adoption of ICT. So the following hypothesis is proposed.

H1: There is a significant relationship between technology barriers and ICT adoption among SMEs

Organizational barrier:

The organizational barrier is also associated with ICT. The literature reported that ICT adoption may be limited by Financial Cost, lack of IT training program, Uncertainty and risk, Cost of internet connectivity, and Satisfaction with the existing system. Earlier studies (Reid, 2003) confirm that SME growth to a great extent is affected by financial limits. The external financing of the SME always has to go through difficult consequences as there is the possibility of bankruptcy in SMEs and easy alteration of SMEs' assets. In other words, limited finance creates a hindrance in ICT adoption as well as the development of SMEs. Studies also suggested that IT knowledge is essential for the adoption of technology, to compete and achieve in the technological field a firm's policy should contain vital training programs on ICT. It is observed that the attitude towards computers is a consequence of training and learning. Further, According to a few researchers (Teo, 2007; Tan, et al., 2007), uncertainty and risk are commonly cited barriers to ICT adoption. It has a lot of perplexity, doubts, and uncertainty among the entrepreneur in India. Small firms in comparison to large corporations cannot easily mobilize the resources and cannot bear the risk and uncertainty related to new technology adoption and installation in the firm. This creates hindrances in ICT adoption in SMEs. Moreover, Setting up a new technology is a high-cost incurring, also to use this technology extra staff with technical knowledge is required, as well as maintenance cost of the website and other infrastructures, payment of consultancy fees, and staff training (Kwadwo et al., 2016). In addition, sometimes changing the existing work procedure also causes resistance towards ICT adoption (Zaied; 2012). The above discussion leads to the following hypothesis.

H2: There is a significant relationship between organization factors and ICT adoption among SMEs

Environmental barriers:

The environmental (external industry) limitation plays a significant role in the adoption of new technologies. External industry refers to trading partner readiness (buyer and supplier) and

government policies and these are due to a Lack of understanding and trading partner readiness. The Adoption of ICT and e-business largely depends on the trading partners' acknowledgment. There is a link between the firms and the trading partners' decisions, as any decision taken by the firm will affect the whole system, the firm decision to introduce an e-business model requires the major involvement of the partners (Simatupang et al., 2002). The attitude of the trading partner is a key determinant for the adoption and implementation of innovative technologies. Further, the lack of understanding about new technology creates hindrances in adoption (Ranganathan et al., 2004). In addition, both industry and government bodies have a role to play in promoting and supporting small business networking and ICT. Given the globalization of the ICT industry, there is a need to understand the government's role in contributing to the success of ICT development. One such government support in ICT is the government's tax incentives. Sometimes Government supports start-ups and ICT companies to attract foreign investors to form a strong international-oriented company created locally. So the following hypotheses is stated :

H3: There is a significant relationship between Environmental barriers and ICT adoption

Regional barriers:

Sometimes regional barriers also discourage ICT adoption and these are mainly lack of Lack of knowledge, Lack of technological support: Lack of experience, Computer anxiety, Lack of internet and power connectivity, Trading license, and Geographical Location. To compete and achieve in the technological field a firm's policy should contain vital knowledge on ICT to enhance the technology up gradation. The Adoption of e-business is enlightened with the availability of human resources with specific awareness and knowledge (Kindström, Kowalkowski & Sandberg, 2013). Moreover, the Technological support of SMEs is a vital element, out of various software and hardware available for the firms choosing the right set of technology that best suits its activities. According to (Hunaiti et al. 2009) one of the major barriers to SMEs' adoption of ICT is lack of experience. Due to a lack of experience in setting up an e-commerce website, advanced advertisement, better customer services, and an advantageous competitive environment, unfamiliarity with online transactions and the nonexistence of laws for online business transactions makes it fearful to adopt ICT in SMEs. In addition, Computer anxiety is a user's emotional response towards fear of negative outcomes, like resulting in damaging the computer system or ending up appearing foolish during the use process, the negative notion of the user leads to high anxiety during task performance. In a few studies, it is observed that computer anxiety acts as a barrier to the adoption of ICT. In developing countries, poor and outdated telecommunication for the internet and lack of electric power connectivity create an infrastructural hindrance to ICT adoption. Technology adoption in developing countries is mostly concentrated in and around urban areas, with the rural areas suffering from poor connectivity, thereby making it more difficult for technology. Sometimes the licensing of the trade and the procedure for adoption of ICT, as well as e-commerce in India, is lacking behind due to the absence of understanding of the basic concept of ICT by the entrepreneurs, sometimes absence of licensing leads to blockages of the IP addresses by the commercial sites world over (Hidayat 2004). Besides, technological infrastructure can be a barrier or an encouragement due to the geographical location of a country. For instance, setting up a technological infrastructure in remote locations is difficult due to road networks as well as transportation. (Minges, 2002).

The following hypotheses are proposed for the study: So we propose the following hypotheses can be framed :

H4: There is a significant relationship between Regional barriers and ICT adoption

Top Management Characteristics:

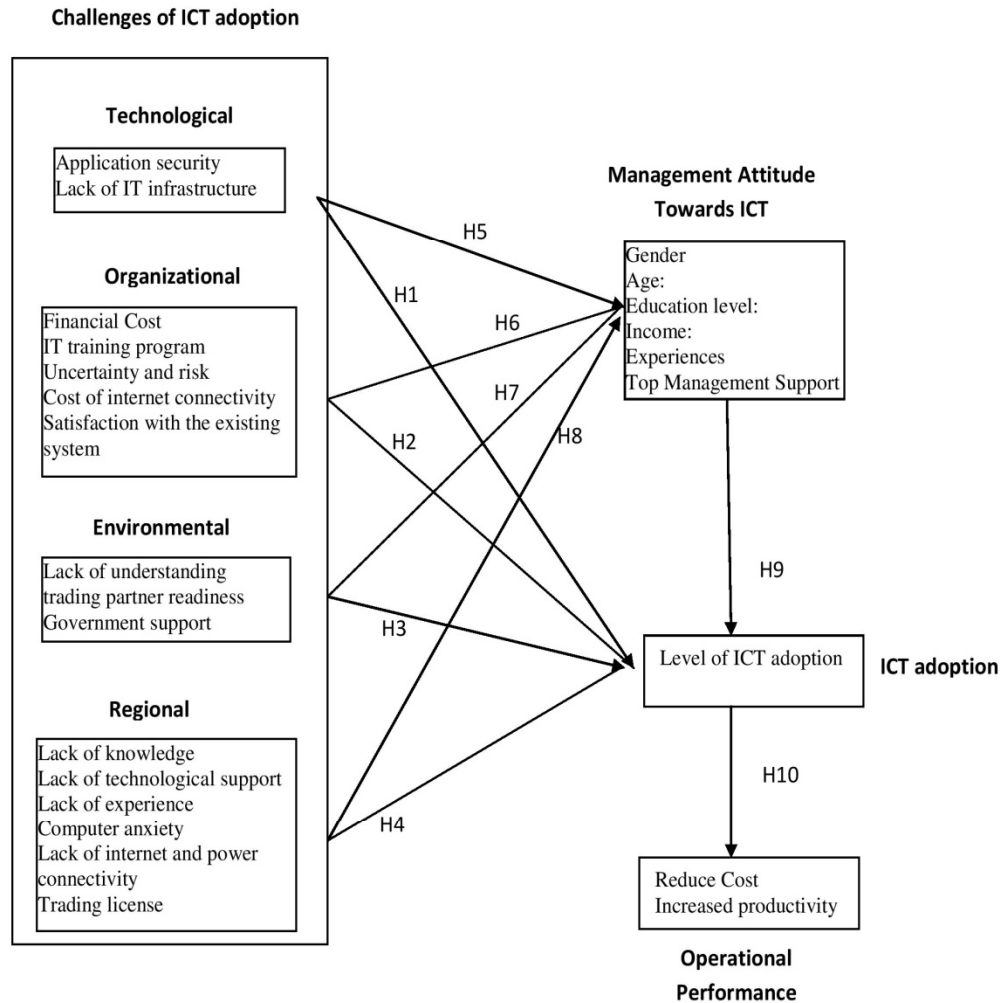
Management of the firms finds it challenging with the revolution that ICT brought at the firm level. Firms are now aware of the fact that ICT adoption in the work culture of the firm is creating a competitive environment, thereby generating a requirement for other firms to accept ICT at the managerial level of operation. Managerial support is important for organizational innovation adoption decision-making, as the transformation of the organization's existing work procedure is upgraded to trading partners' technologies. So the attitude of top executives is sometimes responsible for ICT adoption. Managerial characteristics can be measured by gender, age, education, income, and experience to some extent. Gender is a significant variable in analyzing factors that create an impact on the utilization of ICT (Information and Communication Technology) (Sang et.al, 2010). Gender differences were shown to have a significant effect in some studies (Akman& Mishra, 2010) males and females behave differently when it comes to technology adoption and use technology differently. Similarly In an organization age plays a vital role in the adoption of technologies, younger employees tend to have a more positive attitude toward using new technology as compared to older workers (Wang, et. al., 2009). Studies state that age differences have immense significance in work attitudes as well as the behavior of an individual. Another important aspect of technology adoption is the level of education, which influences employee's behavior and attitude toward the adoption of new technology. Employees with a college or graduation degree qualification are more likely to adopt e-business technology than those who do not hold degrees (Turban, et. al., 2002). Education influences reactive approaches to fast technological transformation. This means those workforces that have an educational qualification or training are expected to understand how as well as when to make use of technology(Legris, et; al, 2003). Income is also an important factor in the adoption of technology. Higher income encourages the use of the Internet in undertaking online purchases whereas low income cannot bear the risk of online transactions (Lu, Yu, Liu, and Yao, 2003). Adoption is influenced by favorable experiences in terms of innovations, and compatibility which accounts for a generalized motivation for the organization (Damanpour & Schneider, 2006).). Computer-experienced individuals are determined to have extra knowledge regarding how to make use of ICTs furthermore this is expected to increase with the duration spent with the computer (Akman & Rehan, 2010). The following hypotheses are stated :

H5: There is a significant relationship between technology barriers and Top management characteristics among SMEs

H6: There is a significant relationship between organization factors and Top management characteristics among SMEs

H7: There is a significant relationship between Environmental barriers and Top management characteristics

Figure 1: Proposed Research Model



H8: There is a significant relationship between Regional barriers and Top management Characteristics.

H9: There is a significant relationship between Top management characteristics and ICT Adoption

Operational performance

The study of Anh & Matsui, 2011 result that quality management information (QMI) significantly affects the different dimensions of the operational performance of various countries. According to few studies (Bayo et. al,2013; Gibbs et al,78) ICT resources are positively associated with operational performance. Theses studies mentioned that ICT is an additional channel for firms to do business as a means to reduce costs as a means to improve operational performance. Many SMEs have not yet reached a level of maturity that most SMEs expect a short-term increase in operating performance. So we propose a hypothesis based on the relationship between ICT adoption and operational performance :

H10: There is a significant relationship between ICT adoption and operational performance in SMEs of North East India

The conceptual model derived for the study is shown in Figure 1. The schematic diagram of the theoretical framework above is used to show the relationship between the dependent and independent variables. Essentially, the theoretical framework shown above is the foundation on which the entire research is based.

4. Methods

The units for the study are mainly of small and medium-sized enterprises (SMEs) of Assam that are registered with the District Industries Centers (DICs) and Micro, Small, and Medium Enterprises (MSME) of the state . The population of the study comprises 206 SMEs consisting of 192 manufacturing sector and 14 service units from 20 districts of Assam. The target population was defined as the top management team from the select enterprises of Assam and therefore respondents included owners and top managers of these enterprises. The samples have been arrived with equal representation from all the selected districts with 1:4 proportion. Finally, 50 SMEs were selected at the convenience of the researcher, and from each SME, four representatives were considered as sample respondents. A total of 160 numbers of responses were received out of 200 numbers after discarding the ambiguous and missing responses.

To investigate and validate the conceptual framework in the context of SMEs of Assam, a questionnaire was developed to collect responses. Respondents were asked to indicate their responses on a five-point Likert scale. The collected responses were then tested for reliability, normality, and multi-collinearity. Finally, SEM analysis was conducted with the SEMOPY package in Python to establish the relationship between exogenous and endogenous variables.

Test of reliability, normality, and Multi-collinearity

The measurement of reliability provides consistency in the measurement of variables . The Internal consistency reliability is tested with Cronbach alpha. The values of alpha for constructs such as technological, environmental, organizational, regional , managerial characteristics and ICT adoption are 0.81, 0.86, 0.87, 0.88, .74 and 0.79 respectively and as all these are above cut-off limits, that is 0.7, the constructs are therefore deemed to have adequate reliability.

To evaluate the structural models, dataset must satisfy two assumptions and these are a) a larger sample size and b) multivariate normality. This study involves a relatively large sample (160 no.) and therefore, the Central Limit Theorem could be applied hence there is no question about the normality of the data. After verifying model assumptions, finally dataset is finally imported into the Python software package.

5. Results and Discussion:

In this section, the results and analysis of the empirical study are presented and discussed. The main aim of this analysis is to identify the relationship between the challenges of ICT and the level of ICT adoption. The SEMOPY, a Python package is used for the SEM analysis to establish the relationship between the constructs under study. Then, the factors related to ICT adoption are discussed. Finally, some recommendations are given to the managerial and government context.

SEM analysis

The data were analyzed using SEM analysis. The purpose of SEM analysis is to relate endogenous variables with exogenous variables and Table 1 presents the results of the individual hypotheses being tested.

From the previous studies, we investigated the internal as well as external challenges affecting ICT adoption among SMEs in North East India. The Internal factors are technology, organization, managerial characteristics, and external factors such as environment. As a result, these factors such as technology, organization, and region are considered exogenous constructs whereas managerial characteristics and environment are endogenous constructs as they are dependent on exogenous variables.

The model is built with a semopy model in Python. Table 1 exhibits results of the SEM analysis and the standardized parameter estimates with respective p-values are shown . The 0.05 significance level was considered for the study . The results of the SEM model exhibit the relation between challenging factors, ICT adoption, and operational performance. To verify the structural model, the model Fit indices are calculated. The model resulted in a not significant chi-square test with a p-value of 0.091 ($p > .05$) . However, the chi-square test is often overpowered and commonly leads to misleading, and thus other fit indices such as NFI and CFI of relative fit indices and study values were .091 and 0.93 which exceeding .90 are often taken to indicate a good fit. Another class of indices is the absolute fit which is tested with RMSEA and values for this are .042 falling below .05 is often taken to indicate a good fit.

The results show that technological factors as a whole are not significant in affecting ICT adoption. This reveals that IT application security and IT infrastructure are not limiting the level

Table 1: SEM analysis showing significant relationship

lval	op	rval	Estimate	p-value	Significant	Hypothesis
lev_adop	~	Technological	-0.3779	0.98		H1 rejected
lev_adop	~	Organizational	0.09867	0.04		H2 accepted
lev_adop	~	Enviornental	0.2321	0.01	*	H3 accpeted
lev_adop	~	Regional	-0.8396	0.04	*	H4 accepted
lev_adop	~	Management_Attitude	-0.0445	0.01	*	H9 accepted
Management_Attitude	~	Technological	0.7827	0.98		H5 Rejected
Management_Attitude	~	Organizational	-0.2075	0.98		H6 Rejected
Management_Attitude	~	Enviornental	0.66488	0.92		H7 Rejected
Management_Attitude	~	Regional	-1.4443	0.00	*	H8 accepted
operational_performace	~	lev_adop	1.34567	0.00	*	H10 accepted
security	~	Technological	1	-		
lack_IT	~	Technological	-0.008	0.87		
lack_understanding	~	Enviornental	1	-		
trading_partner_readiness	~	Enviornental	-0.8382	0.00		
govt_support	~	Enviornental	0.81297	0.00		
cost_internet_connect	~	Organizational	1	-		
satisfaction_existing_sysm	~	Organizational	-1.5274	0.07		
IT_training	~	Organizational	-1.51	0.08		
finanical_cost	~	Organizational	-1.4682	0.00	*	
uncertainty	~	Organizational	1.16385	0.00	*	
lack_knowledge	~	Regional	1	-		
lack_tech_support	~	Regional	0.90238	0.00	*	
lack_expereince	~	Regional	0.88065	0.00	*	
computer_anxiety	~	Regional	0.88942	0.09		
lack_internet_connect	~	Regional	0.9077	0.07		
trading_license	~	Regional	1.01756	0.09		
power_connectivity	~	Regional	-0.9828	0.00	*	
geo_location	~	Regional	0.97792	0.80	*	
exp	~	Management_Attitude	1	-		
age	~	Management_Attitude	0.26152	0.00	*	
gender	~	Management_Attitude	0.04823	0.10		
education	~	Management_Attitude	0.48159	0.00	*	
income	~	Management_Attitude	1.00001	0.57		
reduce_cost	~	operational_performace	1	-		
increase_productivity	~	operational_performace	1.03983	0.00	*	

of ICT adoption in SMEs. This may be because of the advancement of technology in the region. Whereas organizational barriers significantly affect ICT adoption for SMEs. This may be due to high financial costs and uncertainty associated with SMEs which create a hindrance in ICT adoption as well as the development of SMEs.

Likewise, Regional barriers are a concern for ICT adoption as they influence negatively ICT adoption in SMEs. This is mainly due to a lack of technological support, power connectivity, and lack of experience of SMEs while dealing with ICT. Similarly, Environmental factors also have a negative influence on ICT adoption. These findings are consistent with the findings of Kindström,

Kowalkowski & Sandberg, 2013 ; Hunaiti et al. 2009; Lawrence and Usman, 2010). However, the results reveals that government support creates a positive atmosphere since efforts are being to provide the necessary support to the SMEs. As a whole, technological, and environmental barriers are not considered as obstacles whereas regional and environmental barriers are significantly affecting ICT adoption in SMEs. This finding is particularly consistent with the findings (Sahay & Avgerou, 2002; Harbi, et al., 2009;)

Further, the result shows that technological, organizational, and environmental barriers do not influence positively or negatively management attitudes toward IT. However, Regional barriers significantly influence ICT adoption and have a negative relationship. This indicates that regional barriers such as lack of technological support, power connectivity, and lack of experience of SMEs create a negative management attitude towards ICT. These findings also supported by Mehrtens et al. (2001) who demonstrated clearly that employees with technological skills are particularly encourage firms to recognize and implement ICT into their businesses. Small business owners/managers are unlikely to adopt more sophisticated technologies if they are not familiar with the basic ones. This may be a principal internal de-motivating factor for businesses to adopt ICT.

Finally, Table 1 shows that the level of ICT adoption also influences operational performance. This justifies that ICT adoption reduces the cost of operation and increasing s efficiency and effectiveness of the entire business process This finding is also supported by Bayo et al(2013). Bayo et al (2013) opined that ICT resources are positively associated with operational performance.

6. Limitations and future directions

Like other empirical studies, this study is not without its limitations. Our sample consisted of SMEs in Assam may limit the generalizability of the results to the entire Northeast India. Although several technology adoption studies focused on the zone basis (Van Beveren and Thomson, 2002; Cloete et al., 2002), state-based respondents, such as experience using technology, differ from state to state from the overall population of SMEs. The sample size itself is relatively small. The study can be strengthened by increasing the sample size and including participants in other geographical areas. With an increased sample size, a more detailed empirical analysis among the independent variables and the variables that have multiple categories can be performed.

7. Conclusion

This study investigated challenging factors that affect the intention to adopt ICT in the SMEs of Northeast India and provides more in-depth information about the reasons why local SMEs are reluctant to ICT for their business activities. A survey instrument was formulated to obtain feedback from SMEs in the region assessing their awareness, receptivity, and adoption of ICT in

their business. To focus on SMEs, the state Assam is selected purposely as a representative state of the entire North-East under some assumptions. Assam is the largest state in north-east India and has an agrarian economy. The state is famous for tea production, oil fields, and rich biodiversity, the state is also rich in products like bamboo and timber and has various small-scale industries that flourish with time, namely- handicraft, handloom, tea industry, and others. The study reveals significant regional indicators of SMEs' intention to adopt ICT in their business. Identifying these indicators may help the industry or government to provide appropriate information and support thus enhancing ICT usage and at the same time create better awareness of the benefits of ICT to encourage a higher rate of adoption. The government should also focus in pre-training to the Management of SMEs on how to use ICT systems in business at all levels so that they get comfortable with its.

The study confirms that the usage of ICT applications for business purposes brings numerous advantages for its users to business processes. At present, most SMEs are curious to find out the benefits that they can gain through appropriate ICT implementation. Implementing ICT in the organization will be able to offer businesses a wide range of possibilities for improving their competitiveness and providing mechanisms for getting access to new opportunities and specialized information services. The research was done under an empirical framework based on the previous study and may serve as a starting point for ICT adoption research while encouraging further exploration of the challenging constructs. The study also contributes to and extends our understanding of the operational performance of SMEs, identifying the rationales for adopting or rejecting ICT by the SMEs.

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