Availability of E-commerce Support for SMEs in Developing Countries

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Abstract: Although research indicates e-commerce offers viable and practical solutions for organizations to meet challenges of a predominantly changing environment, the few available studies related to SMEs in developing countries reveal a delay or failure of SMEs in adopting ICT and e-commerce technologies. The various factors identified as causes for the reticence can be broadly classified as Internal Barriers and External Barriers. This paper presents a model for barriers to adoption of ICT and e-commerce based on the results of an exploratory pilot study, survey and interviews of SME intermediary organization. It identifies support for SMEs in Sri Lanka with regard to ICT and e-commerce. It also determines a strong need for necessary support and discusses the availability of the support.

Keywords: e-commerce, SME, adoption, developing countries, barriers, support.

INTRODUCTION

Developing countries have the potential to achieve rapid and sustainable economic and social development by building an economy based on an ICT-enabled and networked SME (Small and Medium-sized Enterprise) sector, capable of applying affordable yet effective ICT solutions [1]. It is accepted that e-commerce contributes to the advancement of SME business in developing countries [2]. With the development of ICT and the shift to a knowledge-based economy, e-transformation and the introduction of ICT is becoming an increasingly important tool for SMEs both to reinvigorate corporate management and promote growth of the national economy[1]. E-commerce technologies facilitate organizations to improve their business processes and communications, both within the organization and with external trading partners [3].

However, the adoption of ICT and e-commerce in developing countries has fallen below expectations [2], as they face unique and significant challenges in adopting ICT and e-commerce [4]. Nevertheless, it is imperative for SMEs to adopt e-commerce technologies to survive in intense competitive national and global markets.

The SME sector plays a significant role in its contribution to the national economy in terms of the wealth created and the number of people employed [5]. Forging ahead SMEs need to accept the challenges, including the barriers as they move towards successful adoption of available technologies while raising awareness of relevant support activities and preserving limited available resources to avoid severe repercussions from costly mistakes.

This paper contributes to the ability to understand factors that inhibit ICT and e-commerce adoption in SMEs in Sri Lanka, a developing country on its way to an e-society. Believing that research findings from Sri Lanka will prove to be useful for other developing countries it explores how best the barriers could be overcome by way of support activities. The paper first outlines current research into adoption in developing countries, discussing models for adoption by previous research and presents a framework established for use with this research. The research methodology and the results are subsequently discussed.

THEORETICAL FRAMEWORK

SMEs in Sri Lanka

SMEs everywhere play a critical role in economic development, and Sri Lanka is no exception. Many countries use different parameters to define SMEs by referring to: number of employees, amount of capital invested or amount of turnover [6]. In Sri Lanka a clear definition of a SME is absent with government agencies using different criteria to define SMEs [6, 7]. The National Development Bank (NDB), the Export Development Board (EDB), and Industrial Development Board (IDB) use value of fixed assets as the criterion, whereas the Department of Census and Statistics (DCS), Small and Medium Enterprise Development (SMED), and the Federation of Chambers of Commerce and Industry (FDCCI) use number of employees as criteria [7].

Following the World Bank definition, for this study we consider enterprises with 10-250 employees as SMEs [6]. The 2004 mission statement of the International Labour Organization (ILO) reported that 75% of Sri Lanka's labour force was employed in the SME sector depicting SMEs' contribution towards employment and income generation.

The domestic market is the main outlet for SMEs. SMEs are also sub-contracted to large exporters with larger entrepreneurs coordinating direct exports as is seen with coir - based products, wood, handicrafts,

plants and foliage. If Sri Lanka wishes to ride high on the electronic highway it should provide Sri Lankan SMEs 'a ramp to the digital highway' and stimulate e-commerce. This is supported by the government's e-Sri Lanka vision, championed by the Information and Communication Technology Agency of Sri Lanka (ICTA), aiming to harness ICT as a lever for economic and social advancement.

Barriers to ICT and e-commerce Adoption by SMEs

Developing countries face insurmountable barriers getting on to the electronic highway. Yet, it is encouraging to note existing research to identify barriers in a variety of factors grouped into several categories. A number of authors [8, 9] group such factors into three major categories: owner/manager characteristics, firm characteristics, costs and return on investment. Support for SMEs to adopt e-commerce technologies, demand consideration for each of these categories.

While diversity among owner/managers and the decision makers for SMEs, reflects on a number of factors towards adoption of e-commerce technologies it can be concluded that factors affecting adoption relate to owner/manager characteristics. A significant factor here is little or no knowledge, firstly of the technologies, and secondly of the benefits from such technologies. This is a major barrier to the take up of e-commerce [10], lack of knowledge on how to use the technology and low computer literacy, mistrust of the IT industry and lack of time also hinders the adoption. SME owners, concerned about a return on their investments, are reluctant to make substantial investments particularly since short-term returns are not guaranteed [11].

Other factors, such as the current level of technology usage within the organization related to the characteristics of the organization, also affect adoption of e-commerce [10]. The Organization for Economic Co-operation and Development (OECD (1998) has identified that: lack of awareness; uncertainty about the benefits of electronic commerce; concerns about lack of human resources and skills; set-up costs and pricing issues; and, concerns about security as the most significant barriers to e-commerce for SMEs in OECD countries. Low use of e-commerce by customers and suppliers, concerns about security, concerns about legal and liability aspects, high costs of development, limited knowledge of e-commerce models and methodologies, and unconvincing benefits to the company are among other factors [12]. SMEs definitely have limited resources (financial, time, personnel). This "resource poverty" has an effect on adoption, as they cannot afford to experiment with technologies and make expensive mistakes [13].

Barriers to e-commerce in Developing Countries

If governments believe that e-commerce can foster economic development it is necessary to identify inherent differences in developing countries with diverse economic, political, and cultural backgrounds to understand the process of technology adoption [9]. SME studies of e-commerce issues in developed countries [14 - 16] indicate issues faced by SMEs in developed countries can be totally different. Organizations adopting ICT and e-commerce in developing countries face problems like: lack of telecommunications infrastructure, lack of qualified staff to develop and support e-commerce sites, lack of skills among consumers needed in order to use the Internet, lack of timely and reliable systems for the delivery of physical goods, low bank account and credit card penetration, low income, and low computer and Internet penetration [4, 17, 18]. Lack of telecommunications infrastructure includes poor Internet connectivity, lack of fixed telephone lines for end user dial-up access, and the underdeveloped state of Internet Service Providers.

Disregard for e-commerce is not surprising where shopping, a social activity in Sri Lanka, recognizes face-to-face contacts as important. Distrust of what businesses do with personal and credit card information in countries where there may be good justification for such distrust, could become a serious obstacle to e-commerce growth [18, 19].

Absence of legal and regulatory systems inhibits development of e-commerce in developing countries. A study of SME adoption of e-commerce in South Africa found that adoption is heavily influenced by factors within the organization [12]. Lack of access to computers, software/hardware, affordable telecommunications, low e-commerce use by supply chain partners; concerns with security and legal issues; low knowledge level of management and employees; and unclear benefits from e-commerce were found to be major factors that inhibit adoption. Similar study in China found that limited diffusion of computers, high cost of Internet and lack of online payment processes directly inhibit e-commerce. Inadequate transportation and delivery networks, limited availability of banking services, and uncertain taxation rules indirectly inhibit e-commerce adoption.

A study in Egypt [20] found main contributory factors to non-adoption include: awareness and education, market size, e-commerce infrastructure, telecommunications infrastructure, financial infrastructure, the legal system, the government's role, pricing structures, and social and psychological factors. A comparison of two studies in Argentina and Egypt suggests key factors affecting e-commerce adoption in developing countries are: awareness, telecommunication infrastructure, and cost. The Internet and e-commerce issues of SMEs in Samoa are consistent with the studies conducted in other developing countries [21]. Studies in Sri Lanka revealed inhibiting factors as: lack of knowledge and awareness about benefits of e-commerce, current un-preparedness of SMEs to adopt e-commerce as a serious business concept, insufficient exposure to IT products and services, language barriers and lack of staff with IT capability [7]. Web-based selling was not seen as practical as there is limited use of Internet banking and Web portals, as well as inadequate telecommunications

infrastructure [7].

Thus, available literature reveals significant factors dealing with internal and external barriers that can be grouped to develop a framework for investigations affecting adoption of e-commerce technologies.

Internal Barriers: SMEs can control internal factors categorising them into: Individual (owner/ manager), Organizational and barriers related to cost or return on investments.

External Barriers: Those that cannot be resolved by the SME organization and are compelled work within the constraints. Inadequate telecommunication infrastructure and legal and regulatory framework are examples of external barriers. These could be further subdivided into: infrastructure related, political, social and cultural and legal. Some external barriers could be addressed by clustering sharing expenses, resources and facilities.
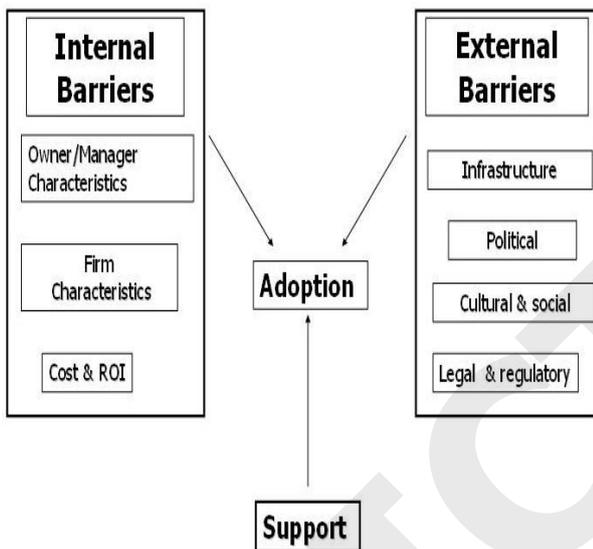

Figure 1: Conceptual Model - Barriers to Adoption

RESEARCH METHODOLOGY

Empirical research in this area being limited, an exploratory investigation utilizing qualitative and quantitative evidence was considered most suitable. The research centred round SMEs in Colombo District with the highest density of companies using ICT. Colombo district was the base for investigations with SME selection necessitating employee strength of 10–250 employees; not totally immature but somewhat versatile in the use of ICT and e-commerce.

The study was conducted in two stages preliminary pilot interviews, a survey, and interviews with SME intermediary support organizations According to Mingers[22], the use of such multiple methods is widely accepted as providing increased richness and validity to research results, and better reflects the multidimensional nature of complex real-world problems. Besides, a multi-method approach allows for the combination of benefits of both qualitative and quantitative methods, and permits empirical observations to guide and improve the survey stage of the research [23, 24].

The preliminary pilot interviews brought in barriers imperative to SMEs with the model (Figure 1) and the survey instrument, forming outcome from interviews and observations supported by an extensive literature review. The survey and interviews with intermediary support organizations followed. Face-to-face interviews were semi-structured to gather qualitative empirical data and provide flexibility [25] as they allow researchers to explore issues raised by respondents, generally not possible through questionnaires or telephone interviews.

The research was carried out in three stages. Stage 1: was the Pilot Exploratory Study withSMEs, Stage 2: Survey of the SME organisation using a questionnaire and Stage 3: Interviews with intermediary SME Organisations.

The research approach has been discussed elsewhere [26] and therefore it suffices to discuss the results in the following section.

RESULTS DISCUSSION

Barriers: Pilot Interviews: A majority (88%) of respondents ranked lack of awareness the most significant barrier. This can be attributed to the fact that the majority of owner/managers, described themselves as basically computer literate. Knowledge of available technologies or suitability for effective use towards improved productivity for benefits was negligible. They appear to be confused with choices in software/hardware. Computers, were underutilized with adhoc purchases and isolated implementation shadowing ICT strategy; a major concern, being decision makers. Next, was the cost of Internet, equipment and e-commerce implementation. Inadequate telecom infrastructure chosen by 83% was the third most frequently cited barrier chosen by the more advanced in usage of ICT using e-mail and Internet, more likely to have experienced problems. Unstable economy, political uncertainty, lack of time, channel conflict, lack of information about e-commerce and lack of access to expert help, was cited as barriers by 70% of respondents.

Analysis of Survey data: More than 75% of the respondents (96% males and 4% females) were either professionally qualified or graduates. Of the Tables produced below, Table 1 identifies the top 6 internal barriers of 9 listed. Table 2 shows external barriers, divided into Cultural, Infrastructure, Political, Social, and Legal and Regulatory. Tables 4 and 5 illustrate internal and external support needed. Analysis of survey results reveal that lack of skills, lack of awareness of benefits and return on investments prevent SMEs from adopting ICT and e-commerce technologies, reinforced by ''awareness and education'' ranking top for support by nearly 90% of the respondents, not surprising for a developing country like Sri Lanka trying to implement technologies. It reflects on other internal barriers too and awareness and education can, to a great extent, counter this barrier. Since use of ICT in Sri Lanka is low, e-

commerce faces inhibition and does not suit business transactions.

"Lack of popularity in online marketing" and "low Internet penetration" rate high in the list of external barriers. Improving ICT diffusion in Sri Lanka can address this problem. 'Inadequate infrastructure' impedes SMEs as reinforced by their request for "improvement of national infrastructure" raking very high on the support needed. SMEs in Sri Lanka are adversely affected by the high cost and unreliable service of infrastructure services such as electricity and telecommunications. The steps taken by the government to improve telecommunication facilities breaking telecom monopoly is noteworthy. Policy inertia and the lack of legal and regulatory framework also rank high and enforce constraints on SMEs. Policy reforms introduced by governments support the large export-oriented foreign direct investments leaving SMEs with ad-hoc policy prescriptions and weak institutional support [27]. The government's role in an overly bureaucratic regulatory system results in delays in its deliberations and is extremely costly [27]. Appropriate legal and regulatory framework would ensure that SMES operate on a level playing field.

Social barriers come next. A one-stop shop facility helps SMEs access information, technology, markets, and the much needed credit facilities. This concept, implemented for export-oriented foreign direct investments (EOFDI) by the Board of Investments (BOI) found it to be successful. Being policy makers working towards progress of SMEs, senior management lacking in ICT knowledge is identified as an important constraint directly impacting operational efficiency of SMEs. Awareness building and education with regard to ICT and technologies would help to alleviate this problem. Government, academia, and industry sectors can take leadership roles in promotion of ICT by conducting awareness and training programs, technical and non-technical catering to the needs of SMEs at grass-roots level. SMEs place a very heavy reliance on external advice and support. Such support and advice seem unavailable.

Perceptions of the SME Intermediaries: The intermediaries, with a consensus for awareness building programs at national level agree lack of awareness and lack of skills are major barriers for SMEs to adopt

technologies. Training programs; workshops and seminars conducted in the local language need to be especially designed for SMEs at grass roots level.

Absence of a "one-stop shop" for advice and support is de-motivating and affects SMEs. It is fundamental to educate senior management of government organizations prior to providing support for SMEs with ICT and e-commerce. SMEs need not only ICT technologies but also quality control and standards.

Inter-institutional coordination, staff development, and institutional capacity are also vital. Much effort seems replicated and wasted with public sector, private and non-governmental SME intermediary organizations working in isolation. The government is best equipped to reach rural SMEs at grass roots level. Tapping and utilizing all available strengths in a more coordinated manner would prove much more productive.

Analysis of Barriers and Support

This section discusses the extent to which the barriers are addressed by the support provided by the SME intermediary organization. The Table 5 and Table 6 given below illustrate the barriers that ranked as most significant, Table 7 identifies the support required to alleviate the barriers and table 8 indicates whether support is available by the SME intermediary organisations.

Barriers

The internal barrier "employees lacking the required skills are ranked the highest in the list". The interviews with the intermediary organizations reveal that this barrier is addressed only partially. While they admit that the SMEs need skill training from the grass root level, they are not in a position to deliver that support as they do not have the resources nor the mechanism to address that barrier. "Security concerns with payments" ranked next on the list. Support is not available from the intermediaries and they are not in a position to provide any support in this regard. The next two barriers on the list can be addressed with awareness building programs. The intermediaries do not seem to be addressing that fully.

Table 1: Internal Barriers to using or extending use ICT & e-commerce

Internal Barriers	Mean	Std	N	%
Staff lack required skills	3.88	1.35	120	66.6
Security concerns with payments over the internet	3.64	1.28	118	66.9
e-commerce cannot give a financial gain	3.64	1.24	108	62.0
N = number of organisations				

Table 2: External Barriers to using or extending use of ICT & e-commerce

External Barriers	Mean	Std	N	%
Cultural Barriers				
Lack of poularity for online marketing and sales	3.56	1.28	120	62.5
Infrastructure Barriers				
Low internet penetration in the country	3.78	1.09	125	71.2
Inadequate quality and speed of lines	3.63	1.06	130	70.8
Inadequate infrastructure in the country	3.52	1.22	125	62.4
Political Barriers				
Unstable economic climate in the country	3.73	.971	135	73.3
Changing regulations with each govermment change	3.72	1.12	135	71.9
Social Barriers				
Lack of information on e-commerce	3.59	1.04	133	69.1
No one-shop facility	3.50	1.19	127	54.3
No access to reliable expert help	3.25	1.10	130	52.8
Senior management in other sector lack ICT knowledge	3.24	1.05	123	52.8
Legal & Regulatory Barriers				
Little support for SMEs from govermment and industry associations	3.7	.96	128	64.0
Inadequate legal framework for business using e-commerce	3.68	.98	121	64.5
No simple procedures and guidelines	3.67	1.10	128	65.6
Lack of suitable software standards	3.51	1.10	128	53.9

N = number of organisations

Table 3: Internal Support for SMEs to use or extend use of ICT & e-commerce

Internal Support	Mean	Std	N	%
Awareness and education	3.91	.87	132	79.9
Guidance in overcoming risks associated with implem entation	3.86	.92	129	78.0
Guidelines for appropriate hardware and software	3.78	.88	134	72.4
Advice and direction for ICT and e-commerce	3.70	.91	135	70.4

N = number of organisations

Table 4: External Support for SMEs to use or extend use of ICT & e-commerce

External Support	Mean	Std	N	%
Improve national infrastructure	4.04	.76	130	84.6
Provide financial assistance	3.97	.81	135	78.5
Provide tax in centives	3.97	.92	132	80.3
Improve ICT diffusion	3.95	.83	130	80.8
Government & industry sector to take leadership/promotion role	3.91	.91	134	75.4
Improve collaboration among SMEs	3.86	1.04	133	69.1
Improve low bank account and credit card penetration	3.83	.81	123	72.4
Enforce suitable software standards	3.8	.97	132	74.3

N = number of organisations

Table 5: Internal Barriers

Internal Barriers	Required Support	Is Support Available?
Employees lack the required skills	Training	Minimal
Security concerns with payments over the Internet	Legal framework	No
e-commerce cannot give any financial gains	Awareness	Minimal
e-commerce not suited to the way we do business	Awareness	Minimal

Table 6: External Barriers

External Barriers	Required Support	Is Support Available?
Lack of popularity for online marketing & sales	Awareness	No
Low Internet penetration in the country	Awareness and Infrastructure	No
Poor speed & quality of line with telecommunications	Infrastructure	No
Inadequate infrastructure in the country	Infrastructure	No
Relatively high cost of internet access	Infrastructure	No
Unreliable power supply	Infrastructure	No
Unstable economic climate in the country.		No
Constant change of rules and regulations		No
The lack of available information on e-commerce	Awareness	Partially
No one shop facility for services	One stop shop	No
Snr. Management lacking in ICT knowledge	Training	Minimal
No access to reliable expert help	Consultancy	Minimal
Little support from government/industry with policies	Legal framework	No
Inadequate legal framework for using e-commerce	legal framework	No
No simple procedures and guidelines	legal framework	No
Lack of suitable software standards	legal framework	No

The above table 6 illustrates that in order to resolve the external barriers, support in infrastructure, awareness building, education, and training and consultancy is required. The SME intermediaries are helpless in providing the support with infrastructure and legal framework as the government intervention is required. The lack of availability of information and the lack of popularity of e-commerce can both be addressed by appropriate awareness building programs. Even though it is available to a certain extent, the SME intermediaries are not capable of proving fullest support to address this barrier due to lack of proper mechanism to reach the SMEs at grass root level. Even though the intermediaries are making an effort to generate awareness, they also seem to be hindered by finances and resources and lack of properly formulated strategies and coordinated programs.

Support

The survey results revealed the support strongly requested by the SMEs. The Tables 8 and 9 given below illustrate the support that ranked as most significant, within the organization: internal support and outside the organization: external support. It identifies the support required to assist them and also whether support is available with the SME intermediary organizations.

Table 7: Internal Support

Internal Support Requested by SME	Is Support Available?
Guidance to overcome risks with implementing	No
Awareness building/educating in ICT & e-commerce	Partially
Assist SMEs with guidelines for hardware and software	No
Advice & direction with regard to ICT & e-commerce	No

Guidance to overcome risks with implementing e-commerce ranked highest in the list of support for SMEs. They need support in every aspect of the implementation of e-commerce starting with knowledge, technical, management, and consultancy. This support is not available from the SME intermediary organizations. Assisting with hardware and software and also advice and direction is minimal and almost non–existent. It could also be contributed to the fact that the main focus of the intermediaries is first and foremost to elevate the standard of SMEs in general. Adoption of e-commerce has taken a back seat in view of the other pressing problems.

Table 8: External Support

External Support	Is Support Available?
Improving national infrastructure	No
Provide some form of financial assistance to help SMEs	No
Government & industry sector to take leadership & promotion	No
Provision of tax Incentives	No
Improve low computer & internet penetration	No
Improve low bank account & credit card penetration	No
Enforce suitable software standards	No
Improve collaboration among the SMEs	No

The above table shows the support required from outside the organization: external support. Other than the item listed last; "improve collaboration among SMEs" the intermediaries are not capable of proving support with the other barriers. They need to liaise with the government to provide such help to the SME organizations.

The evidence from the above tables is informative. A few barriers; namely, awareness creation and training, appear to be addressed to a certain extent while a majority of the barriers are either disregarded or totally neglected by the participant SME intermediary organizations. It is also evident that where such support is available, it is restricted to the urban areas. Further, there appears to be a disparity between the SMEs' requirements and the support available with the SME intermediaries. The SME intermediaries, on the other hand, seem to be facing trouble, meeting with their objectives. Apparently, this hinders progress with the efforts of the SME intermediaries to assist SMEs. Perhaps this drawback can be attributed to uncoordinated efforts that lack proper strategy, frequent changes of government resulting in changes of rules and regulations, lack of interest from the authorities concerned or may even be due to lethargy from both the public and the private sectors towards heavy investment in what is often seen as an unstable economic environment.

CHALLENGES FACING SMEs

The objectives of this study were to understand and determine the importance of internal and external barriers; and support required to overcome them. The importance of barriers shows that SMEs are extremely hindered by external barriers. The internal and external support required reveals that there is a strong request for it.

The difference between adoption patterns in developing and developed countries focuses on support activities needed in the development. Support is available in developed countries and it is a matter of finding the appropriate support for a SME encountering barriers, whereas in developing countries this support is almost non-existent. Another difference centers on the external barriers identified, such as the need to improve the national telecommunications infrastructure.

This research contributes by identifying the absence of a government and industry coordinated approach to providing support for SMEs, and not addressing problems at a grass-root level. In addition an initial framework for eTransformation of SMEs in a developing country is proposed for trial towards validation.

Next on the Agenda

Next, further statistical analysis of survey data attempts to validate initial outcomes, test construct validity, and assumption testing. Barriers and support that predominate at various levels of sophistication need determination for unique perspectives in examining issues and understanding. Problems need to be prioritised at different levels to enable SMEs better equip themselves progress through e-Transformation. Finally the initial framework will be trialled with case study organizations.

CONCLUSION

This study provides an understanding of the challenges faced by SMEs in the adoption of ICT and e-commerce in developing countries. Assessing and determining current levels of ICT and e-commerce sophistication of SMEs it examines barriers impeding SMEs, while identifying support required for eTransformation. The developed conceptual model identifies internal and external limitations while assessing necessary support to overcome obstacles.

The results of the exploratory interviews and the survey clearly indicate the necessity to provide support to SMEs if they are to successfully adopt ICT and e-commerce. Faced with identified barriers, both external and internal, these barriers are found to impede SME uptake of ICT and e-commerce. Accordingly, necessary support to overcome or alleviate the barriers discovered had also to be recognised. This support, in the form of suggestions were later confirmed in a series of interviews carried out with SME intermediaries whose task is to provide some support, but agree with the existence of many internal and external barriers that prohibit the uptake of ICT or e-commerce by SMEs. The intermediaries go further with their observations. They believe and confirm that SMEs are restricted with the strength or the capacity to address these barriers on their own.

The little available support extended by intermediary organizations at present, seems to be inadequate. Besides, the available support programmes are incapable of meeting SME requirements. It was not surprising, therefore, to note that some SMEs were

even unaware of the existence of intermediaries, leave alone the support programmes offered by them. Apparently, only a few SMEs have opted to receive assistance from the intermediaries. The identification of a lack of support, an important outcome from the SME intermediary interviews as a possible factor, contributes towards the slow uptake of ICT and e-commerce as explained by them. Their projects do not seem to be sufficiently geared towards the needs of the SMEs. Moreover, it is apparent that activities of such bodies are seen as uncoordinated and bureaucratic. This fact is in agreement with previous research [28].

In an age where information and technology combine to evolve new and emerging technologies that are speedily snapped up by the developed world for their betterment, it is sad to see the developing, trailing behind for the want of necessary financial, and other support. In such a scenario, it is vital that both industry and government step in with the correct advice and support to help SMEs with their uptake of e-commerce. One of the major outcomes of the study presented in this chapter is the necessity to review current initiatives aimed at promoting ICT and e-commerce with the SMEs and to develop strategies with systematic focus to help SMEs to e-Transform their organisations. This information can be fed up to the relevant government authorities to assist them with strategy formation.

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