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Role of Information and Communication Technology (ICT) in improving performance of service SMEs in Bangladesh: An empirical analysis

*Mohammad Mizenur Rahaman**
*Mosaddak Ahmed Chowdhury***

Abstract

In a competitive business world, the service industry faces different types of challenges in providing services to current and potential customers. Diverse needs of customers create complexities for the firm to satisfy their customers within their capacity and strategic goal, especially for SMEs. These challenges require that organisations apply new management systems and technology based services. ICT application has been presented as an important device to overcome the inherent challenges that make SMEs vulnerable. Through the rapid spread of information and communication technologies (ICT) and ever decreasing prices for communication, markets in different parts of the world become more integrated. This study mainly investigated on the service SMEs, explore whether the use of ICT (as information processing technology or as information communication technology) can contribute on the performance of SMEs and help them to cope with these new challenges in developing countries like Bangladesh. This study applied a quantitative method as the study is empirical in nature. The survey technique was used to collect primary data from the respondents and SPSS 22.0 was used to analyse collected data. Secondary data like different research articles and reports were reviewed for the identification of these issues. The model used in this study regressed with some selected variables and found significant relationships, with the use of ICT for Business Performance at a 1% level of significance. Finally, this paper concludes that ICT can directly contribute to improving the performance of service SMEs in Bangladesh in a different way and support the facing of challenges in a competitive business world.

Key words: *ICT, performance, service SMEs.*

* Assistant Professor, Department of Business Administration, Shahjalal University of Science and Technology, Sylhet -3114, Bangladesh.

** Associate Professor, Department of Business Administration, Shahjalal University of Science and Technology, Sylhet -3114, Bangladesh.

1.0 Introduction

Small and medium enterprises played an imperative role for the developing countries' economies especially with respect to employment generation and economic development. The increasing competition through globalization puts them under considerable pressure. Through the rapid spread of information and communication technologies (ICT) and ever decreasing prices for communication, markets in different parts of the world become more integrated. Therefore, one basic query is to explore whether the use of ICT support can minimise the cost, increase quality of services, increase customer satisfaction, and finally lead to the eventual gain of competitive advantages of service organization. The spread of ICT has led several commentators to argue that these technologies are creating a new economy or information economy in which information is the critical resource and basis for competition. It is argued that in remote regions, the disadvantages that arise with isolation can be significantly lessened through access to rapid and inexpensive communication (Torero, 2000). Today organizations of all types are utilizing Information and Communication Technologies (ICT) around the globe, not only for cutting costs and improving efficiency, but also for providing better customer service (Ashrafi and Murtaza, 2008). Governments too, around the world, are adopting ICT to provide better services to their citizens. The adoption of ICT by organizations requires a business environment encouraging open competition, trust and security, interoperability and standardization and the availability of finance for ICT (UNCTAD, 2004). However, there are also more pessimistic views that assume that the digital divide will increase and therefore producers in developing countries and especially in rural areas will face even greater disadvantages relative to their competitors in developed countries (Bedi, 1999). Though the use of ICT played very important roles in the production or manufacturing SMEs, there was little evidence found in previous studies about the benefits of the service SMEs in Bangladesh. Thus, it is very important to understand about the role of ICT on services in developing countries, especially in Bangladesh.

2.0 Objectives of the Study

The main objective of the study is to investigate the role of ICT on improving the performance of the growing service SMEs in Bangladesh.

The specific objectives of the study are:

- To appraise the present situation of the service SMEs in relation to ICT application in Bangladesh;

- To investigate the financial, operational, technical, and strategic role of using ICT in existing SMEs in Bangladesh;
- To identify the key outcome areas of ICT application;
- To recommend some guidelines based on the findings on how to gain better benefits from using ICT.

3.0 Methodology of the Study

Research methodology of the study was focused on quantitative study. Data were collected from managers or owners of the service SMEs through a semi-structured questionnaire using survey techniques, while in-depth literature reviewing was completed for developing a theoretical framework.

Sample Design

The study has observed 320 respondents' data from different manufacturing and service SMEs. In Bangladesh, there are various types of business organizations. From different categories', the most common sectors are Communication, Education, Health Services, Financial Services, Manufacturing, and other various service industries. The study selected different industries, from which an overall of 200 organizations were surveyed. From 200 organizations, the study has observed 20 financial organizations, 30 educational institutions, 30 communication services organizations, 50 manufacturing organizations, 50 health services organizations, and 20 others type of service based organizations.

Table 1: Distribution of the surveyed sample

Region	Types of SMEs		Total
	Service	Manufacturing	
Dhaka	65	25	90
Sylhet	65	15	80
Comilla	20	10	30
Total	150	50	200

Collection of Data

The data were collected from the selected region from January 2016 to March 2016. The sample region was selected based on researcher convenience and respondents were selected also conveniently using non-random opportunity sampling technique. In this study, semi-structured questionnaires were used to collect primary data from the respondents while secondary data like books, thesis papers, articles, reports etc. were also used.

Model used

For determining variables to measure the impact of ICT on improving the performance of service SMEs, a conceptual framework was used and indicators of organizational performance was also established from the reviewing of the latest literature. This study considers two outcome variables: one is the growth of sales revenue based on empirical data and overall organization's performance based on the respondent's perception and others are considered as independent variables.

Analysis of Data

Descriptive statistics, Regression analysis, ANOVA were used to analyse data efficiently through SPSS 22.0 version.

4.0 Literature Review

4.1 ICTs

ICT refers to Information, Communications and Technology and can be defined as technologies that concern to the new knowledge of collecting, storing, processing and transmitting information whereby information, computing, and telecommunications are converging. ICT is any technology used to support information gathering, processing, distribution and use (Beckinsale and Ram, 2006). Thus, ICT can be broadly defined. ICTs can be viewed as all forms of technologies and products for a wide range of software, hardware, telecommunications and information management techniques, applications and devices used to create, produce, analyze, process, package, distribute, retrieve, store and transmit or receive information electronically in a digital form such as computers, email, internet, websites, social networking and other wireless communications devices, networks, broadband, and as well as the various specialized devices and applications associated with them, such as satellite systems and videoconferencing (Porter and Millar, 1985; Brady et al. 2002; Nicol 2003).

4.2 SMEs

There is no universally accepted definition of Small Enterprises (SEs) all over the world. The definition of SEs is relative and varies from one country to another, as well as from one point in time to another within the same country. In Bangladesh, SEs definition was given in two ways: one for manufacturing firms and another for servicing firms. The following table shows the criteria for defining SMEs in Bangladesh.

Table 2: Criteria for defining SMEs

S.N.	Type of Industry		The amount of investment (Replacement cost and value of fixed assets, excluding land and factory buildings)	Number of employed workers
1.	Small Industry	Manufacturing	50 lakh to 10 crore	25 to 99
		Service	5 lakh to 1 crore	10 to 25
2.	Medium Industry	Manufacturing	10 crore to 30 crore	100 to 250
		Service	1 crore to 15 crore	50 to 100

Source: National Industrial Policy (2010).

4.3 Role of ICTs on SMEs

Today's world is a technological world and the contributions of technology cannot be denied in any type of business organisation; whether it is service oriented or a manufacturing industry. Majority of ICT implementation is applied by large companies, even SMEs. The ICT application is not avoided by any business organisations; such as, the business activity tend to apply ICT provided there is an impact on the SMEs business process. The large industries have concerns with the use of new technologies in supporting the business. Over the past two decades, the using of ICT by SMEs has generated a great deal of interest among researchers, governments, and international organizations (Kabongo & Okpara, 2014). However, majority of SMEs have limited usage to the adoption of ICT in business activities (OECD, 2004). In previous studies, different authors argued that ICT has a significant impact on the SMEs in connection with competitiveness and performance of the firm (Barney 1991; Alam and Noor 2009; Melville et al. 2004; Obijiofor et al., 2005; Apulu and Latham 2010). ICT can play a direct role in improving performance which leads to achieving competitive advantages for the firm. Different authors categorises performance of the firm in different aspects like financial performance and strategic performance. Indicators of the financial performance might be profitability, growth, and market value of the firm, again strategic performance can be measured by customer satisfaction, employee satisfaction, and intangible benefits (Consoli 2012; Matei & Savulescu, 2012; Liang et al. 2010; Santos and Brito 2012).

Competitive advantage is the heart of a company's performance. It reflects a company's ability to offer consumers greater value either by means of lowering prices or by providing greater benefits and services that justify higher prices (Porter and miller, 1985). When it comes to ICT's role in connection with company competitiveness, ICT offers enterprises avenues to compete on a global scale with improved efficiency and provides closer customer and supplier relationships (Alam and Noor 2009; Yusuf 2013).

ICT also played an important role in the case of innovation, which is a prime characteristic of entrepreneurs whose main area of the business is SMEs. ICT also plays an integral role in the implementation of new or significantly improved goods or services, process, a new marketing method, a new organizational method in business practices, workplace organization or external relations (OECD, 2003). Moreover, Porter (2001) argues that today the issue for organizations is not the acquisition and deployment of technology but rather how companies innovate.

4.4 Role of ICTs on Service SMEs

Service SMEs are firms which are involved in providing services to the organization and who have employees up to 100 and investments up to 15 crore taka (Industrial Policy, 2010). Application of ICT in service SMEs is increasing day by day. Many of the recent works take account of the technological perspective, since various supportive technologies do in fact have a great impact on services (Gallouj, 1994). The economic importance of SMEs within the sector of services is highly recognized in developed nations. According to Eurostat (2008), in total, there were almost 19 million enterprises in the EU-27's non-financial business economy in 2004. Of these, 99.8 % were SMEs, the majority of which were micro enterprises (employing fewer than 10 persons). However, in order to have a significant impact on Europe's economy, SMEs need to grow bigger, meaning that they should increase employment, expand their variety of services, and enlarge their markets and earnings. The use of ICT in SMEs should be more encouraged and this could involve improving technical and managerial skills of the firm (Eikebrokk T. R. and Olsen D. H., 2007). SMEs within the sector of services should use ICT because it provides many benefits at different levels (Love P. et al., 2004): operational level, tactical level and strategic level of the firm.

4.5 ICT and Performance of the firm

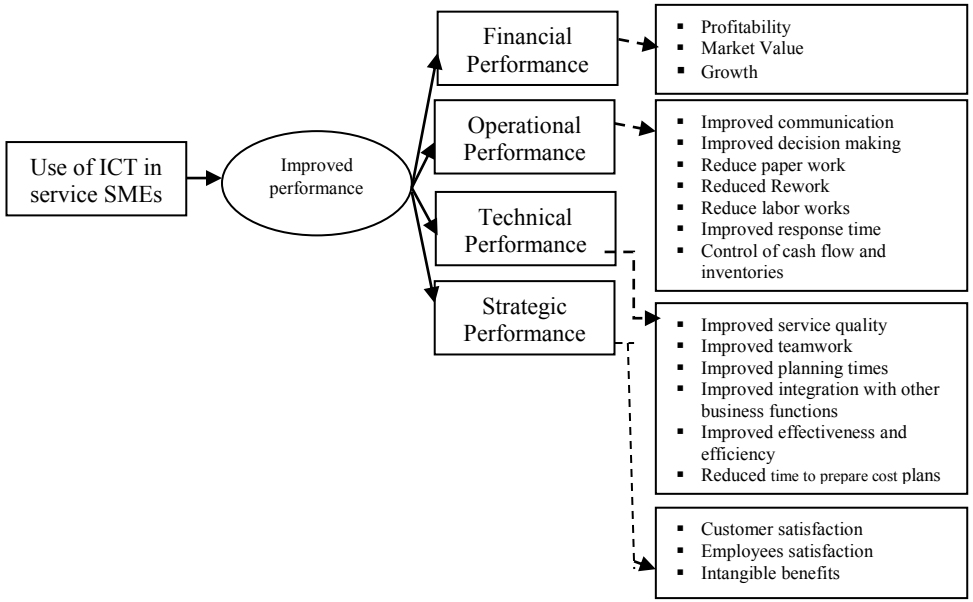
ICT can play a significant role in improving the performance of service SMEs. The entrepreneur's demographic, psychological and behavioral characteristics, as well as their managerial skills and technical know-how are some of the factors that could influence the performance of an SME (Ion and Andreea, 2008). The relationship is also affected by many characteristics of the service sectors,

environmental, firm-specific features and firm strategies. Competitiveness of an SME is revealed by the long-term performance of the company, related to its competitors, which is the result of being competitive (Man et al., 2002).

5.0 Conceptual framework of ICT's role on the performance of Service SMEs

Considering the previous literature in the areas of ICT used in the organization, this study makes a theoretical conclusion about the use of ICT in service SMEs.

Figure 5.1: Conceptual framework of ICT's role on performance of Service SMEs.



Source: The authors own development based on previous literature and field study.

6.0 ICT application, service SMEs in Bangladesh

Bangladesh's small and medium enterprises (SMEs) can play a big role in pushing national economy up to the level required to achieve the millennium development goal of halving poverty over the next five years. Bangladesh's economy, which grew by 5 to 6 per cent on average since 1996, and the Gross Domestic Product (GDP) rise between 8-10 per cent by 2015, has had significant contribution towards SMEs. There are about 6 million SMEs in Bangladesh, making up about 90 percent of all industrial units in the country that employ about 31 million people and contribute around 25 percent of the GDP.

Government of Bangladesh has been declared as a Digital Bangladesh and is taking necessary steps to improve ICT application in different sectors while SMEs got priority. As a target of MDGs, the Government of Bangladesh is focusing more on ICT as well as SMEs development.

Table 3: Internet users of selected Asian countries.

	2000	2010	2014
	Internet users/100		
Bangladesh	0.07	3.70	9.60
India	0.53	7.50	18.00
Pakistan	..	8.00	13.80
Sri Lanka	0.65	12.00	25.80

Source: World Bank data, 2016.

7.0 Owners or managers' views about ICT application for improved performance of business organizations

A. Age of business: For service SMEs, which are interested with the blessing of ICT in business, maturity of most of the businesses are 6-15 years. Those businesses which are running for more than 15 years usually use ICT to cope with the change of time in a dynamic world. On the other hand, newly started performance services are likely to use ICT in business.

Table 4: Age variation of Business

Age of Business					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	0-5 years	24	7.5	7.5	7.5
	6-10 years	144	45.0	45.0	52.5
	11-15 years	88	27.5	27.5	80.0
	More than 15 years	64	20.0	20.0	100.0
	Total	320	100.0	100.0	

Source: The authors, based on survey findings.

B. Education of the Owner of the Business

For service SMEs, owners who are mainly running their businesses with the help of ICT are mostly well educated. Very few of the owners did not reach the level of graduation due to business involvement.

Table 5: Educational qualification of the owner or manager of the Business

Education of the Owner of the Business					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bellow SSC	8	2.5	2.5	2.5
	SSC	8	2.5	2.5	5.0
	HSC	56	17.5	17.5	22.5
	Graduation	192	60.0	60.0	82.5
	Post-Graduation	56	17.5	17.5	100.0
	Total	320	100.0	100.0	

Source: The authors, based on survey findings.

C. Use of ICT for Business Activities

To compete with the modern era of businesses, ICT is the most important to improve the performance of service SMEs. Most of the service SMEs is directly or indirectly using ICT for doing their business well.

Table 6: Use of ICT for Business Activities

Use of ICT for Business Activities					
		Frequency	Per cent	Valid Per cent	Cumulative Percent
Valid	Yes	288	90.0	90.0	90.0
	No	32	10.0	10.0	100.0
	Total	320	100.0	100.0	

Source: The authors, based on survey findings.

D. Impact of using ICT on business performance

From the survey study, it was found that most of the respondents (87.5%) believe that the application of ICT has a direct impact on performance of the service SMEs in Bangladesh. They are using ICT to get multiple types of benefits (Table -6). Among these top ten purposes of using ICT shown in the following table, maximum respondents used ICT for maintaining relationships with customers, saving operational time, and producing quick responses to the customers, while a moderate percentage of respondents used ICT for maintaining relationships with suppliers, to minimize the cost of servicing, and for maintaining communications. Again, a low percentage of respondents used ICT for locating customers, increasing reputation and for increasing sales. Table -7b also shows, most of the firms (about 90%) are using ICT for business activities, which are growing with increasing revenues for the last five years.

Table 7a: Purpose of using ICT

Impact of ICT for Business Performance			Purpose of using ICT									
			Use to locate customers		Use to maintain relationship with customers		Use to maintain relationship with suppliers		Use to minimize cost		Use to save to save operational time	
	Frequency (f)	Percent (%)	(f)	(%)	(f)	(%)	(f)	(%)	(f)	(%)	(f)	(%)
Yes	280	87.5	72	22.5	232	72.5	136	42.5	200	62.5	232	72.5
No	40	12.5	248	77.5	88	27.5	184	57.5	120	37.5	88	27.5
Total	320	100.0	320	100.0	320	100.0	320	100.0	320	100.0	320	100.0

Impact of ICT for Business Performance			Purpose of using ICT									
			Use to quick response to customers		Use to E-mail and communication		Use to exchange information		Use to increased sales		Use to increased reputations	
	Frequency (f)	Percent (%)	(f)	(%)	(f)	(%)	(f)	(%)	(f)	(%)	(f)	(%)
Yes	280	87.5	232	72.5	184	57.5	128	40.0	80	25.0	64	20.0
No	40	12.5	88	27.5	136	42.5	192	60.0	240	75.0	256	80.0
Total	320	100.0	320	100.0	320	100.0	320	100.0	320	100.0	320	100.0

Source: The authors, based on survey findings.

Table 7b: Relationship between ICT using and Growth of Revenues of Business

		Use of ICT for Business Activities			
		Yes	No	Total	%
Average Growth of Revenues for last five years	Up to 0%	0	21	21	6.56
	1-5%	0	12	12	3.75
	6-10%	12	0	12	3.75
	11-15%	134	0	134	41.88
	16-20 %	99	0	99	30.94
	More than 21%	42	0	42	13.13
Total		287	33	320	100%

Source: The authors, based on survey findings.

8.0 Analysis and Findings

From the analysis of survey data, this study tries to show the impact of using ICT on different business activities of the service SMEs. The findings show that the use of ICT has a significant relationship with Use of ICT for general business Activities, Use of ICT to Maintain Relationship with Customers, Use of ICT to Save Operational Time, Use of ICT for E-mail and Communication. Relationship among the dependent and independent variables are significant (Table-9). The model provides the R squared and adjusted r squared which is .738 & .733 and .830 & .828 respectively, representing the findings of the study to be reliable (Table -8).

Table 8: Regression Model

Model Summary									
					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
a	.859[a]	.738	.733	.64293	.738	146.994	6	313	.000
b	.911[a]	.830	.828	.13743	.830	384.534	4	315	.000

Predictors: (Constant), Use of ICT for E-mail and Communication, Use of ICT to Maintain Relationship with Suppliers, Use of ICT to Minimize Cost, Use of ICT to Maintain Relationship with Customers, Use of ICT to Save Operational Time, Use of ICT for Business Activities.

a. Dependent Variable: Impact of ICT on average growth of revenue
b. Dependent Variable: positive impact of ICT for Business Performance

Table 9: Analysis of Variance

ANOVA[b]						
Model		Sum of Squares	df	Mean Square	F	Sig.
a.	Regression	29.051	4	7.263	384.534	.000[a]
	Residual	5.949	315	.019		
	Total	35.000	319			
b.	Regression	364.568	6	60.761	146.994	.000[a]
	Residual	129.382	313	.413		
	Total	493.950	319			

a. Predictors: (Constant), Use of ICT for E-mail and Communication, Use of ICT for Business Activities, Use of ICT to Save Operational Time, Use of ICT to Maintain Relationship with Customers

a. Dependent Variable: Impact of ICT on average growth of revenue
b. Dependent Variable: positive impact of ICT for Business Performance

Table-10: Result of chi square and t test

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	320.000[a]	5	.000
Likelihood Ratio	212.413	5	.000
Linear-by-Linear Association	199.685	1	.000
N of Valid Cases	320		

a. 4 cells (33.3%) have expected count less than 5. The minimum expected count is 1.24.

Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	.067	.034		1.972	.050
	Use of ICT for general business Activities	.946	.028	.858	33.969	.000
	Use of ICT to Maintain Relationship with Customers	-.114	.023	-.153	-4.892	.001
	Use of ICT to Save Operational Time	.220	.023	.297	9.463	.000
	Use of ICT for E-mail and Communication	-.083	.019	-.125	-4.499	.000

a. Dependent Variable: Impact of ICT on average growth of sales revenues of the firm
b. Dependent Variable: Impact of ICT for Business Performance

9.0 Conclusion and Recommendations

This study provides theoretical support on the direct and indirect effects of ICT on SMEs performance. In summary, the above literature review suggests that ICT can improve financial, strategic, technical and operational performance of service SMEs, if it is used appropriately. Again from the survey findings, it concludes that ICT is significantly related with the performance of the service firm. In order to gain significant competitive advantage, there should be considerations on some selected areas or activities of the firm. This study focused on 19 key areas which are directly influenced by the ICT application in the firm. From the empirical data by linear regression, this study found that use of ICT has a significant relationship with Use of ICT for general business Activities, Use of ICT to Maintain Relationship with Customers, Use of ICT to Save Operational Time, Use of ICT for E-mail and Communication. For all hypothetical cases, the null hypothesis' are rejected and the alternative are accepted which concludes that the relationship among the dependent and independent variables are significant. (Table-10). This quantitative analysis (regression analysis and chi square test) found impact of ICT on the average growth of sales revenues of the firm and business performance to be significant at a 1% level of significance. This analysis increases the validity and reliability of the study.

Some limitations on this study need to be mentioned. Further research should investigate and analyse the possible level of effects of ICT application and implementation on service SMEs. This study is not directly linked with value chain analysis for increasing the value and reducing the cost of delivery of SMEs through ICT. Some authors shared their insights about possible ICT impact on collaborating enterprises that was not theoretically or empirically tested in previous studies. It is believed that the level of impact of ICT on specific performance areas could be a very interesting trend for future researches.

Therefore, the following issues are recommended through this study:

- SMEs should formulate policies that will facilitate the adoption of ICT facilities by SMEs because of its potential in improving firm's growth performance.
- Training programs for SME managers or owners and employees should focus on both technical and managerial skills which need to be provided in cooperation with the business and sector organisations.
- Government should create opportunity for SMEs so that Internet and other ICT support tools can be easy accessible by the SMEs.
- To raise productivity and global competiveness, SME owners should invest in ICT and its components because they have been proven to significantly influence organizational performance (Table -7b).

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