

Are Small and Medium Enterprises (SMEs) in Bangladesh Adapting ICT in Good Pace? – Challenges and Way Forward

Mohammed Shafiul Alam Khan*

Shazzad Hossain Mukit**

Abstract

With a population of 165 million, Bangladesh has one of the biggest consumer markets of the world, and Small and Medium Enterprises (SMEs) of Bangladesh are an integral part of the economy that directly create approximately 7.86 million jobs. Despite the thriving economy, SMEs in Bangladesh have experienced slow ICT adoption in its different sectors. This study aims to find the current scenario and critical issues of ICT adoption in Bangladeshi SMEs. Key informant interviews and focus group discussions have been used in primary data collection. The study chose an appropriate number of industries from major SME sectors, and identified the ICT adoption levels among the common types of business processes in those industries, for example, manufacturing, order management, accounts management, human resource management, marketing and sales. There have been different trends of ICT adoption observed amongst the sectors. The study identifies several factors and challenges for ICT adoption in SMEs of Bangladesh. Expansion of business, management of finances, and the demand of digital marketing acted as the push factors for SMEs to adopt ICT tools. Cash on return opportunities, competition, and the opportunity of streamlining processes through ICT tools are the pull factors for SMEs to adopt ICT tools. The findings of the study have provided reasons for the inability to adapt ICT in business among the business owners. Lack of basic ICT knowledge among the entrepreneurs, unskilled labour, lack of coordination between academia and industry, lack of trust in local ICT service providers, etc. are the few prominent causes of lagging behind in ICT adoption by SMEs in Bangladesh. Many of the policies impacting SMEs have been observed to be generalized and disconnected with the greater vision of a thriving SME ecosystem, which is one of the crucial problems identified in this study. On top of that, implementation of the policies and governmental activities have been found to be inadequate compared

* Institute of Information Technology (IIT), University of Dhaka, Dhaka, Bangladesh

** Innovision Consulting Private Limited, Dhaka, Bangladesh

to the complexity of the SME sector, and the processes that have been digitized are deemed too difficult for the SMEs to adopt. The study has formulated some recommendations such as reforming VAT policies to incentivize ICT adoption among SMEs, identifying the ICT service requirements among different industry sectors and ensuring availability of those services in the local market, establishing customized training modules for the SMEs along with ensuring affordable services for their management systems.

1.0 Introduction

Technological progression of industries happens in phases, old and the new technologies used in the first industrial revolution (1750-1840) paved the way for the second industrial revolution (1830-1915). Then with the power of computing technology and nuclear energy paved the path to the third industrial revolution (1969-2010s). In the recent decades, fusion of advances in artificial intelligence, robotics, the internet of things, quantum computing, and genetic engineering are blurring the boundaries between the digital, physical, and biological worlds. Thus, the world is undergoing the process of the fourth industrial revolution.

Bangladesh, a fast-developing country, does not have all aspects of the fourth industrial revolution. To fully adopt the components of fourth industrial revolution, majority of the Bangladeshi businesses and industries first need to be adopted technological components of the third industrial revolution like- ICT tools, internet-based services, etc. In the last two decades due to rapid expansion of ICT and internet infrastructure, Bangladesh has observed a varied degree of digitization in the business processes across all industries. Digitization/integration of value chains, digitization of products and service offerings, digital business models and customer access through digital platforms are the three main components of this stage in digitization. However, this progress is not equally distributed. Some progressive business entities are using IT products and solutions such as Enterprise Resource Planning (ERP), Vehicle Tracking System (VTS), Supply Chain Management (SCM), E-commerce system, advanced accounting tools like Tally in their everyday work. On the other hand, most of the SMEs are yet to adapt ICT tools into their day-to-day business.

Small and Medium Enterprises of Bangladesh are the integral part of the economy. As more companies are entering the sector with the help of technological advancement and expansion, the nascent industry is becoming versatile. The SMEs in Bangladesh are providing millions of jobs, i.e. in 2019, around 6,600,685 people were working in small enterprises, 706,112 people in medium enterprises, and 558,870 people were involved with micro enterprises in

Bangladesh. Therefore, approximately 7.86 million jobs were directly being created by the small and medium enterprises (Abdin, 2019). Currently, SME's share in GDP is approximately 25% (Rahman, 2020) which is assumed to be increased to 32% by 2024 (Asian Development Bank, 2021). Despite the thriving economy, SMEs in Bangladesh have experienced slow ICT adoption in its different sectors. The business sector of Bangladesh has a digital adoption index of 0.35/1, which indicates that the business sector in Bangladesh is lagging behind in digitization (Digital Adoption Index, 2016). Also, on the bright side, Bangladesh has also been recognized as one of the “break-out” economies that is rapidly digitizing its economy (Chakravorti, 2020).

Therefore, it is required to have a clear picture about the current scenario of ICT adoption among SMEs. It is also important to identify the challenges of SMEs' ICT adoption in Bangladesh. Both of the issues have been addressed in this study. The study is also focused on the success factors for efficient adoption of ICT in SMEs, the impact of the ICT adoption of SMEs and their coping mechanisms, and recommended actions for way forward. In the study, ICT adoption was measured according to ICT-based tools usage in various business operations of the organization, for example, order management, accounting management, human resource management, marketing and sales.

It is found from the study that both service and manufacturing SMEs are expanding their businesses rapidly using innovative technologies, but many of SMEs in Bangladesh, especially in the light engineering sector, are unable to fully utilize the ICT infrastructure for several reasons, such as high cost of internet services, lack of uninterrupted electricity supply, lack of trained human capital pool, lack of broadband internet services, and lack of trusted ICT service providers in the rural areas. Many of the agricultural-based businesses are located outside Dhaka, mainly in rural areas. These businesses are facing challenges to use the ICT services available in Bangladesh. Thus, the economy is being deprived from the benefits of having full-fledged SMEs with good ICT infrastructure.

The rest of the article is structured as Section 2 describes the available ICT tools and services for SMEs and relevant research on SMEs in Bangladesh. The research methodology follows to conduct the study is briefly described in Section 3. Section 4 presents the major findings of the study in detail. Prospective recommendations to overcome the challenges and to increase the ICT adoption in SMEs in Bangladesh are presented in Section 5. Section 6 concludes the article.

2. Literature Review

2.1 Availability of ICT Services

2.1.1 Government Initiatives

Bangladesh ranked 147 of 176 on the ICT Development Index 2017 maintained by International Telecommunication Union (ITU), indicating medium to low adoption of ICT in the country (ITU, 2017). Although the global ranking of Bangladesh is low, the ICT sector is one of the fastest growing sectors of its economy. The sector has been declared as the thrust sector by the government. The Information and Communication Technology Division is a government organization for the development and promotion of ICT in Bangladesh. Several broad ICT initiatives taken by the Bangladesh Government are as follows.

- Government sites for taxation and paperwork
- Union Information and Service Centre (UISC) for bringing opportunities for rural under-privileged communities to better access ICT tools and services
- A2i Program
- Automated educational and financial programs, such as Ekshop (<https://www.ekshop.gov.bd/>)
- Online platforms focusing on the SME sectors of Bangladesh, for example, BSCIC online marketplace (<https://bscicmarket.gov.bd/>) and e-joyeeta (<https://e-joyeeta.com/>).

The followings are the few specific Government initiatives in order to digitize the businesses in Bangladesh that, in turn, promote the business organizations in ICT adoption.

Service	Details
EFD (Electronic Fiscal Device)	The device was introduced by NBR in 2020. It works in such a way that if EFD is installed in a shop/business location or at their POS, these businesses do not have to file VAT return docs. Moreover, NBR is trying to come out of the device-centric approach and adopt a cloud-centric approach for this solution. Businesses can adopt this solution with any device of their choice, and the government will provide support to integrate the software with their devices.
Ekshop	Introduced by A2i, Ekshop is a backend aggregator for buyers and sellers of Bangladesh. It also provides cross-border business facilitations for foreign platforms like- Etsy and Amazon. Ekshop

Service	Details
	website provides capacity building training under the feature called Academy ¹ . The training is particularly focused on SMEs. Ekshop provides a platform-as-a-service (PAAS) model to 14 different government bodies who are directly working with different industries and sectors. For example, Joyeeta Foundation, Shamabay adhidaptar, Bangladesh Small and Cottage Industries Corporation (BSCIC), etc. They are also providing an e-commerce platform under this modality to female-led SMEs from the Joyeeta Foundation, where thousands of users are using this platform regularly. BSCIC ² is also doing similar things with Platform as a Service.
UBID (Unique Business Identity)	The Government of Bangladesh, with the help of A2i, is implementing UBID or Unique Business ID solutions for business with a view to overcoming the identification challenges. Once UBID is there, banks and non-bank financial institutes will recognize these SMEs and provide financial services. Government will later connect UBID with EFD, trade license, BIN, TIN, and other government and financial platforms.
CLTP (Central Logistics Tracking Platform)	The Government of Bangladesh, with the help of A2i, is working on implementing CLTP (Central logistics tracking platform). This initiative is inspired by Royal Mail (UK) or Deutsche Mail (Germany). Once the CLTP system is in place, it will become a national database of all types of vehicles to track and build an efficient logistics ecosystem of Bangladesh.
CGRS (Central Grievance Redress System)	The central grievance redress system is a platform for citizens through which they can send a formal complaint to the government of Bangladesh expressing dissatisfaction with any public service providers.
Other Services	Other solutions that the government is working on right now are, <ul style="list-style-type: none"> • <u>Ekpay</u>: A payment solution (https://ekpay.gov.bd) • <u>Ekshopdelivery</u>: A delivery solution (https://ekshopdelivery.com/) • <u>BPO Delivery</u>: A delivery solution by Bangladesh Post Office (https://bpodelivery.com/)

However, many of the above-mentioned government initiatives are not properly communicated to the respective SME sectors. Therefore, we found that either many of the SME owners are not aware of the concerned ICT services or the offered ICT service does not fulfil the specific requirements of the SME owners. It shows a clear gap between the respective ICT-service initiative and the actual needs in the respective SME sectors.

¹ <https://academy.ekshop.gov.bd/>

² <https://bscicmarket.gov.bd/>

2.1.2 Bangladeshi Private Sector Initiatives

ICT enterprises in Bangladesh are providing solutions to SME owners in different capacities. Initially most of them wanted to have solutions related to website development and digital marketing, but recently the demand for customized solutions increased. Particularly, some startups which are building solutions based on customized specific needs of the businesses have emerged in recent years.

Several Bangladeshi tech-solutions are catering to the SME sector of the country. Few are mentioned below.

Featured Solutions	Type of Solution/ Business process	Key Features	Google Play Store Downloads (July 2022)
TallyKhata	Accounting Solution	Tallykhata is the number one app for keeping business accounts.	More than 5 Million
SME Vai	ERP Solution	SME VAI is the one stop business solution for SMEs covering: accounting, marketing & legal services.	Not publicly available
Marcopolo.ai	Digital Marketing Solution	General and social media marketing solutions for SMEs.	Not publicly available. Although they claim to serve more than 5000 businesses globally.
ShopUp	Fullstack B2B Solution	Inventory management, credit and last mile delivery	Not publicly available.
sManager/Sheba	Operations/ERP	Manager is a mobile app with which all the work of any business can be managed digitally.	More than 1 Million
TruckLagbe	Logistics/Freight Solutions	TruckLagbe is the largest online truck booking platform in Bangladesh to hire pickup trucks, trucks, covered vans or lorries for business or personal use through an app.	More than 500 Thousand
Sindabad.com	Raw Material Providers	Sindabad.com is the first and largest B2B e-commerce company in Bangladesh.	More than 10 Thousand
Halkhata	Accounting Solution	4.6 starred app for keeping business accounts	More than 50 Thousand
Bondhu	Digital Marketing Solution	Bondhu is a digital marketplace for SMEs to sell their products, bookkeeping, and order management	More than 100 Thousand
Betonbook	Accounting Solution	Betonbook is full stack solution for staff attendance, work and pay management	More than 100 Thousand

One of the major challenges for the above-mentioned private sector ICT-service providers is delivering proper customer service support to the remote SME owners and employees who have insufficient ICT knowledge.

2.2 Relevant Research

According to the study of Lightcastle Partners (Lightcastle Analytics Wing, 2021), the growth trajectory of Bangladesh over the past decade has been outstanding with a consistent economic growth led by Ready-Made Garment (RMG) export, stable foreign exchange reserves, steady remittance flow, public sector investment, and private sector consumption. Despite the outstanding growth, some sectors are not performing as they were expected, such as MSMEs and Agriculture.

Miraz and Habib (2016) reveals that the ICT adoption in SMEs depends on the owner's decision. The findings of the study clearly specifies that the ICT adoption is directly connected to the scope of the firm. In another study, Karim & Gide (2019) emphasizes that electronic banking is able to provide faster and reliable financial services to the customers for which they are happy; the service can develop new competitive advantages for SMEs along with improving their relationships with customers. Arefin and Rahman (2020) conducted a study that indicates that the world's businesses are adopting technologies for sustainability through increasing profitability, competitiveness, efficiency, and effectiveness by offering unique products; and the ICT tools are now available and affordable by the local SMEs compared to recent past. A very recent study conducted by Hossain and Chowdhury (2022) shows a positive impact of the use of mobile financial services (MFS) on the production, sales, and profit of Micro, Small and Medium Enterprises (MSMEs) during Covid-19 pandemic, although majority of the MSMEs have not yet adapted MFS in their business operations. Therefore, the study suggests more incentives and supportive policies to motivate MSMEs to use digital transactions.

Azam and Quaddus (2009) emphasize that perceived compatibility, uncertainty, perceived complexity and Internet usage experience of the SMEs are important for the adoption intention of e-commerce by SMEs. Hoque et al. (2016) states that awareness about benefits, top management support, government support, and financial support are the most crucial determinants of the ICT adoption in rural SMEs of Bangladesh. Islam and Nasira (2017) show that Bangladesh can be technologically upgraded focusing on the positive relationship with new technologies introduction. Findings of this study also show the positive relationship between technology adoption and success for SMEs. The findings of Rahman and Kabir (2020) indicate that ERP solutions can significantly improve the supply

chain management systems for SMEs in Bangladesh, because most of the small and medium enterprises are suffering from poor communication problems. The study conducted by Haque and Ahlan (2018) concludes that Information and Communication Technology can boost the performance of general people and improve the overall human capital for poverty alleviation in a society.

Therefore, it is evident that the adoption of ICT in SMEs positively impacts on the growth and profitability of the organization. However, there are challenges and factors that control the level of ICT adoption among the SMEs. The major objectives of this study are to find new insights on these issues.

3. Methodology

The study was based on both primary and secondary research to identify the level of ICT adoption, barriers, and opportunities from a grass-roots level. Number of SMEs in Bangladesh, sectoral overviews, statistical data, and ICT products used in Bangladesh were primarily collected from secondary sources like reports, public databases, articles, and others. Later, to identify the key challenges faced by the SME entrepreneurs and gain deep insights on the related issues, the researchers conducted Key Informant Interviews (KII) and Focused Group Discussions (FGD) with the SME entrepreneurs along with other stakeholders, i.e. National Board of Revenue (NBR), Access to Information (A2i), Ministry of Industries, ICT Division of Bangladesh, ICT entrepreneurs; and industry experts.

The study team divided the respondent SMEs into four groups: manufacturing, agro and processed food, service, and other niche SME sectors (i.e. jewellery, hosiery etc.). SMEs from several industries including light engineering, electric goods, plastics, designer goods, furniture goods, leathers goods, agro and processed food, health services, logistics/transport services, jewellery, and hosiery, participated in the study. The researchers have tried to be uniform in selection of interviewees from all selected sectors, and have been successful to some extent. Data was collected from several locations in Bangladesh to understand the SME clusters, the ICT adoption in those clusters, and derive the implications. Although majority of the interviewees were from Dhaka, several KIIs have been conducted in Jessore, Chittagong, Gazipur and Kishoregonj. Details of the data collection methods are described below.

Desk Research: Comprehensive desk research was conducted to collect data about the different SME sectors and information regarding policies. As the research materials, journals, policy papers, Bangladesh Government reports, and newspapers were used.

Key Informant Interviews: Key Informant Interviews (KIIs) were arranged with the major stakeholder of the SME industry, i.e., SME owners, association representatives from different SME sectors, ICT entrepreneurs who serves the SME, and relevant representatives from the national policy makers and government bodies. The research team included both male and female participation in the KIIs. However, the number of female participations was comparatively low, since the overall SME industry is mostly dominated by the male entrepreneurs. The study team tried to reach more female owned companies, which resulted in finding female respondents in Jessore, Dhaka, and Chittagong.

A total of 33 KIIs were conducted with SME business owners, of which 11 were female entrepreneur and the rest 22 were male SME owners. Nine (8 males and 1 female) KIIs were arranged with the head of different associations relevant to the SME sectors. Nine Interviews were conducted with the personnel representing National Board of Revenue (NBR), Access to Information (A2i), ICT Division of Bangladesh, Ministry of Industry, and several ICT entrepreneurs serving the SME sectors.

Focus Group Discussion: Four focus group discussions (FGDs) with SME entrepreneurs and stakeholders from several industries were conducted using Zoom. FGDs were started after executing half of the KIIs. Therefore, we had sufficient data at hand that triggered more insightful information from the FGDs. The first FGD was focused on the issues of light engineering sectors participated by 3 SME entrepreneurs. Five participants (2 male and 3 female) from the leather goods sector attended in the second FGD. The other two FGDs were participated by SME owners from agro and processed food, and electric and designer goods industry. Four participants (3 male and 1 female) contributed in each of the FGDs. The participants of the FGDs were from different location of the country, i.e., Dhaka, Bogura, Kishoreganj, Mymensingh, and Jessore. Since the FGDs were conducted using Zoom, it was difficult to on board more participants in the FGDs due to the lack of digital literacy among the SME owners.

A detailed sector wise division of the interviews done with the SMEs is given in the Annex. List of the KIIs and FGDs are also provided in Annex for detail. As the study scope is qualitative in nature, there is a very little scope of quantitative data analysis. Rather, mostly, the effort was given on gathering deep insights from different industries, pattern and trend recognition on ICT adoption among them and learnings from other countries. Majority of the data collected for this study was analysed by using interview transcripts from entrepreneurs and

trade facilitation bodies, synthesizing and validating findings from the literature review (academic and industrial reports), Bangladesh government database, industry experts and available public reports, etc.

Although all the major SME sectors were included in the study, the SME market being very fragmented with a variety of products offered, it was difficult in reaching all the actors of the sectors. The study team could not talk to the SME owners from remote clusters. Moreover, it was difficult to understand beforehand if the entrepreneur could give valuable insight. On top of that, arranging online interviews were difficult due to the lack of digital literacy among many of the SME owners.

4. Findings

4.1 Current ICT Adoption in SMEs in Bangladesh

Even as small companies, SMEs have several segments in their businesses, such as accounting, human resource management, sales and marketing, production and so on. From the primary research, it was found that SMEs use ICT tools in their business segments. To understand the current ICT adoption in SMEs in Bangladesh, state-of-the-art tools that are used globally among SMEs (see Table 1) are identified first.

Table 1: State of the Art ICT Tools used in Different Business Processes

Business Process	Types of State of Art ICT tools
Manufacturing	<ul style="list-style-type: none"> ● CAD (Computer Aided Design) software used for development of designs, creating and grading patterns and lay planning. ● CAM (Computer Aided Manufacture) and CIM (Computer Integrated Manufacture) software used for manufacturing planning/optimization, synchronization of machines in the entire manufacturing process.
Financial/Accounting Management	<ul style="list-style-type: none"> ● Globally basic accounting tools like- Excel, Tally, Quickbook, Xero, Freshbook, Wave, etc. ● EPOS (Electronic Point of Sale) software used to speed up sales transactions and keeps account on stock levels.
Operations and Order management	<ul style="list-style-type: none"> ● ERP (Enterprise Resource Planning) software used for HR/payroll management, inventory management, stock level monitoring, order processing, etc. Example- Busy, Sage, Oracle, Microsoft 365, etc.
Sales and Marketing	<ul style="list-style-type: none"> ● Social Media and E-commerce platforms for sales and marketing. ● Communication tools like WhatsApp, Google suit, Microsoft suit, Facebook Messenger, etc.

Many of the globally used ICT tools exist in Bangladesh for SME's operation. Table 2 lists the ICT tools used among Bangladeshi SMEs and industries.

Table 2: ICT Tools Usage across Bangladeshi SMEs/Industries

Business Process	ICT Tools	Industry
Manufacturing	CAD, CAM	Light Engineering and Electrical & Electronics industries
	CAM and CIM	Agro and Processed Food Industry
Finance/Accounting Management	Excel	All industries mentioned in the study
	Tally Khata	Designer Goods, Leather Goods, E&E
Operations/ Order Management	Busy	Plastics Industry
	e-commerce Platforms	Designer Goods, Leather Goods, Plastics, E&E
	ERP Solutions	Health
	App platforms like- Shohoz and TruckLagbe	Logistics
Marketing & Sales	Website	All Industries mentioned in the Study
	Social Media and Digital Marketing	All industries mentioned in the study

4.1.1 Manufacturing

It has been found that limited or no usage of ICT tools has been noticed in manufacturing unit of the SMEs. The following information has been found from primary research:

- Plastics Industry SMEs have limited usage of ICT tools in production.
- Agro and processed food industry also uses ICT tools for production, recipe or product development. Usage of these ICT tools is limited, only some SMEs are using ICT tools for these purposes.

4.1.2 Operations/Order Management

According to primary research, all SMEs have to use some sort of order management processes for streamlining their orders and timely delivery. From the interviews, the following information has been found:

- Several industries such as light engineering, designer goods, leather goods, and electrical and electronics industries have limited usage of ICT tools in order management. Although several of them have websites, order management capacity is limited in those areas.
- Light engineering SMEs have zero usage of ICT tools in human resource (HR) management, inventory management, and production.

- Leather goods, Designer goods, Electrical and Electronics, and Furniture SMEs have limited usage of ICT tools in logistics and HR management.
- Plastics and furniture industries use proper ICT tools in order management, and most of the SMEs in these industries have robust e-commerce platforms or other systems for timely delivery of goods.
- Both of the selected industries in the Service sector use order management ICT tools in their operations. SMEs in the health industries mainly use Enterprise Resource Planning (ERP) software for their order management activities. SMEs in the logistics industries use Vehicle Tracking Systems for their order management activities.
- SMEs in the service sector use ICT tools for human resource management and logistics. Although use of ICT tools is very limited for both industries in these supporting activities, there is limited adoption of ICT tools in these departments. SMEs in this sector are using communication applications like WhatsApp for contact with employees.
- Agro and processed food industry has limited adoption of ICT in their order management activities. SMEs in this industry have websites, but only a few of them are equipped with standard order management software.

4.1.3 Financial/Accounting Management

Accounting is an integral part of any business, same goes for SMEs in Bangladesh. While several SMEs have been using accounting software such as Excel, Tally Khata, and Busy, there are some gaps in their level of ICT adoption.

- Leather goods, designer goods, light engineering, electrical and electronics industries have limited usage of ICT tools in their accounting processes. These industries have been lagging behind in ICT adoption as one of their most important segments, the finance department, is not using ICT tools.
- Plastics and Furniture industries are found to be adept in accounting software. Companies in the plastics industry are using applications like Busy for complex accounting management.
- Both Health and Logistics industries use accounting software for their companies. SMEs in these industries mainly use Excel or Tally Khata for accounting purposes such as salary book maintenance, income statements, and taxation.
- The ICT adoption in accounting management is also limited for the agro and processed food sector. SMEs in this sector are using Excel or Tally Khata for their accounting tasks.

4.1.4 Marketing and Sales

Although having a separate department for marketing and sales is not traditional for small companies in Bangladesh, the processes are practiced for business expansion and revenue generation. From the interviews, the following findings have been derived:

- Leather, designer goods, electrical and electronics, and furniture industries are using ICT tools in their marketing and sales activities in a limited manner, for example, through Facebook. They are using traditional methods on a larger scale compared to formal digital marketing methods.
- SMEs in the plastic industry are using digital marketing and sales in their business. Several SMEs in this sector are using websites and e-commerce platforms for sales purposes.
- ICT tools usage is limited in marketing and sales for the service sector SMEs. Both health and logistics industries have websites but the extent and marketing level of those websites are unknown. Some of the SMEs in this sector have e-commerce platform or dedicated marketing team for increasing sales among business clients.
- SMEs in the agro and processed food sector are using social media and digital marketing for their marketing and sales. However, the usage is limited in this case as well.

4.2 Analysis on Current ICT Adoption in SMEs in Bangladesh

Businesses do not digitize themselves overnight. Most of them go through a process of gradual digital transformation over years. Willcocks et al. (2000) propose a framework to understand how businesses gradually overcome their failings or gaps and gradually adopt higher levels of ICT tools (see Figure 1). According to the framework, initially SMEs start with basic levels of IT adoption with mobile phones (and smartphones). Once they overcome their anxiety gap and perceive the value of ICT adoption to be higher, then they jump into bit higher ICT adoption level and start to adopt tools like computer, software, IT enabled hardware, etc. Then once they overcome internal organizational incompetency, they start to adopt tools like-websites, internet, ecommerce, etc. Finally, after years of capability building they finally graduated into a high ICT adoption level.

Table 3: Defining Different Levels of ICT Adoption (Willcocks et al, 2000)

Levels of ICT Adoption	Color Code
Basic Level: Basic communication with mobile phones and smartphones. ³	B
Low ICT adoption: Basic IT involving computers equipped with basic software and hardware	L
Medium ICT Adoption: Advanced communication level with emailing, internet browsing, video conferencing, file sharing, creating websites, ecommerce	M
High ICT Adoption: Computers equipped with advanced software, enterprise resource planning, inventory management, customer relationship management	H

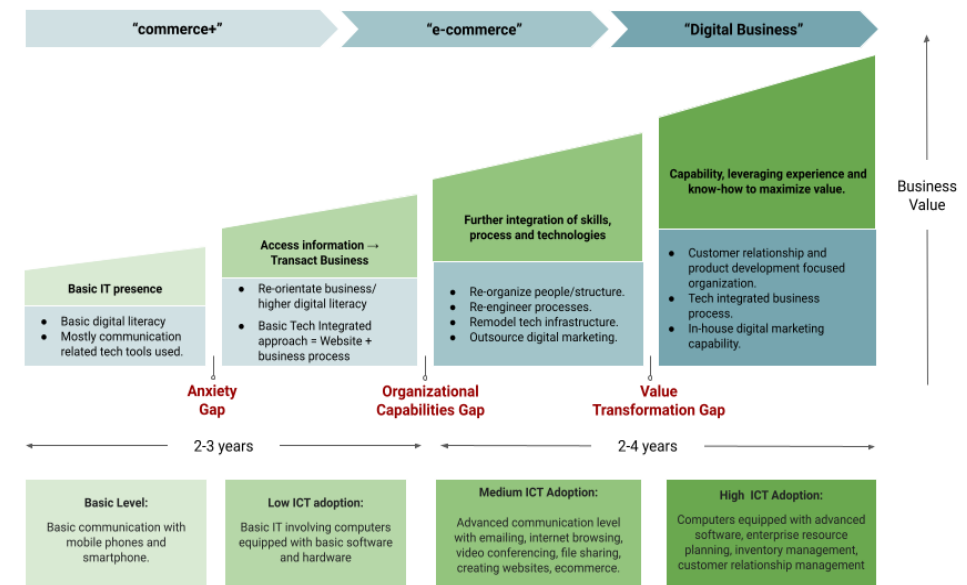


Figure 1: Moving to E-business Framework (Willcocks et al, 2000)

³ In "Moving to E-business Framework" (Willcocks et al, 2000), they mentioned about mobile phones and Fax. But Fax was a previous generation communication equipment replaced by PCs, email communication system or particularly smartphones. So, we replaced it with smartphone. (48% of Bangladeshis have smartphone, source: The Daily Star)

Considering this framework, the researchers map different levels of ICT adoption of four major business processes in SMEs, i.e., Manufacturing, Order/Operations management, Accounting management, and Marketing & Sales. The definition of the levels (see Table 3) is mentioned in the Moving to E-business Framework (Willcocks et al, 2000). The researchers make use of these levels to map out the current ICT levels across SME sectors of Bangladesh (see Table 4).

Table 4: Heatmap of Observed ICT Levels in Bangladeshi SMEs ⁴

Industry	Manufacturing	Operations/Order Management	Finance/Accounting Management	Sales and Marketing
Light Engineering Industry	L	B	L	B
Leather Goods Industry	B	L	L	L
Electric Goods Industry	L	B	L	B
Designer Goods Industry	B	L	M	M
Furniture Goods Industry	B	L	L	M
Plastics Industry	L	M	M	M
Health Industry	(Not applicable)	M	M	L
Logistics Industry	(Not applicable)	M	M	L
Agro and Processed Food Industry	B	L	L	M

4.2.1 SWOT Analysis of Bangladeshi SMEs to Adopt ICT Tools

SWOT analysis is a strategic planning and management techniques used to identify the strengths, weaknesses, opportunities, and threats. Figure 2 shows a holistic picture of the SMEs in Bangladesh. At the inflection points towards the ICT adoption, Bangladesh has many strengths and weaknesses, and several threats the country's SMEs have to tackle to capture the opportunities. Strengths for the SMEs include the country's vast population and large number of internet users, along with that the government is also helping SMEs in ICT adoption through training and programs. Weaknesses of the SMEs include low digital literacy and their low perceived value of ICT tools. Majority of SMEs do not have the technical capacity it requires for a business to fully function in a digital environment. Increasing number of digital consumers, several new business opportunities, and low-cost solutions are some of the lucrative opportunities for Bangladeshi SMEs. But the SMEs do have to tackle several challenges including increase in unskilled labour and high competition.

⁴ No SME sector showed high ICT adoption. Reasons for varied ICT adoption among SMEs for different business processes are discussed a bit later in this chapter.



Figure 2: SWOT Analysis of SMEs in Bangladesh

4.2.2 Challenges of SME Sectors to Adopt ICT Tools

To explore the SMEs' future prospects, Table 5 shows key factors for Bangladeshi SMEs to adopt ICT tools and their key bottlenecks.

Table 5: Factors and Challenges of SME Sectors in ICT Adoption

Sector	Key Reasons to adopt ICT tools	Key Bottlenecks to adopt ICT tools
Leather Goods	<ul style="list-style-type: none"> • Leather goods industry works both closely with other businesses and end customers directly. So, they are heavily dependent on direct and indirect sales and marketing digital channels. 	<ul style="list-style-type: none"> • Lack of technical capacity/digital divide to adopt ICT tools. The SMEs' manpower is dependent on artisanship and craftsmanship of traditional local less educated shoe-makers.
Light Engineering	<ul style="list-style-type: none"> • Government pushes to adopt ICT tools. 	<ul style="list-style-type: none"> • VAT/tax issues push them away to adopt ICT tools like Excel or Tally. • Lack of technical capacity/digital divide to adopt ICT tools. Manpower in the light engineering sector is dependent on the skills of untrained, less educated masters and their apprentices. • Business centric clients do not give them incentive to adopt easy ICT tools like- social media, e-commerce, etc. • Heavy reliance on imported finished engineering goods and weak back

Sector	Key Reasons to adopt ICT tools	Key Bottlenecks to adopt ICT tools
		linkage support from local industries are hampering the growth of this sector.
Electric Goods	<ul style="list-style-type: none"> Government pushes to adopt ICT tools. 	<ul style="list-style-type: none"> VAT/tax issues push them away to adopt ICT tools like Excel or Tally. Lack of technical capacity/digital divide to adopt ICT tools. Heavy reliance on Chinese, Pakistani, Indian made electronic goods, hindering the growth of local manufacturers.
Plastics	<ul style="list-style-type: none"> Robust growth in the local consumer market is leading SME owners to adopt digital platforms like- social media, e-commerce, and logistics solutions. Owners willingness to adopt ICT tools is high among most of the Plastics manufacturers. Rapid expansion of business is pushing SME owners to adopt ICT tools to bring transparency and ensure effective use of resources. 	<ul style="list-style-type: none"> Lack of trusted local ICT service providers, after sales service.
Designer Goods	<ul style="list-style-type: none"> Robust growth in the local consumer market is leading SME owners to adopt digital platforms like- social media, e-commerce, and logistics solutions. Owners willingness to adopt ICT tools is high. 	<ul style="list-style-type: none"> Lack of technical capacity/digital divide to adopt ICT tools. Lack of easy to use solutions for POS, order management, etc.
Furniture Goods	<ul style="list-style-type: none"> Robust growth in the local consumer market is leading SME owners to adopt digital platforms like- social media, e-commerce, and logistics solutions. Increased contract manufacturing practice is pushing SME owners to focus on sales and marketing of their business. 	<ul style="list-style-type: none"> Lack of technical capacity/digital divide to adopt ICT tools. Manpower in the furniture sector is dependent on the skills of untrained, less educated masters and their apprentices.
Health Industry	<ul style="list-style-type: none"> Necessity to have a database of a huge pool of patients pushed them to adopt ERP solutions. 	<ul style="list-style-type: none"> Lack of technical capacity/digital divide to adopt ICT tools in management.

Sector	Key Reasons to adopt ICT tools	Key Bottlenecks to adopt ICT tools
	<ul style="list-style-type: none"> Robust competition and demand in the market pushes them to market their services and adopt digital platforms like- social media and websites. 	
Logistics Industry	<ul style="list-style-type: none"> High risk asset nature of heavy vehicles, pushes logistics SME owners to adopt vehicle tracking systems. Push from local digital logistics platforms to adopt ICT tools. 	<ul style="list-style-type: none"> Lack of technical capacity/digital divide to adopt ICT tools
Agro and Processed food industry	<ul style="list-style-type: none"> Heavy local demand paves the way to increased usage of social media, e-commerce and digital logistics platforms. 	<ul style="list-style-type: none"> Lack of technical capacity to adopt ICT enabled production systems and assure high quality in manufacturing.

The ICT adoption in SMEs has been observed to be low overall in the sectors chosen for this particular study. It has been measured according to tools usage in various business operations, for example, order management, accounting management, marketing and sales. Some companies have been observed to have ICT tools used in human resource management, production, inventory management, and logistics.

A large number of companies have limited use of ICT in accounting management as they were only using Microsoft Excel for all accounting activities. Also, a large number of companies use social media and websites for sales and marketing, along with order management. SMEs that are customer focused have a higher tendency to build websites or invest in social media to reach clients. On other hand, SMEs with business clientele focus on personal networks and connections to reach their clients. Some companies, especially in the service sector, are using vehicle tracking systems and enterprise resource planning software in their business operation.

Some mature and medium sized companies in the plastics industry are using advanced ICT tools such as Busy and Tally Khata, but these tools are not used by many others. However, this is because the majority of the organizations in this sector are mostly micro and small organizations; and the size of the organization impacts on the ICT adoption for the respective organization. In the following section, we will present the facts regarding the ICT adoption among the SMEs and the critical analysis on the facts follows later.

4.2.3 ICT Adoption among Women-led SMEs

Female SME owners are not common across all the SME sectors in Bangladesh. In some particular sectors their presence was not observed, for example, light engineering, electrical and electronics goods manufacturers, and furniture. In other sectors their presence has been noticed in various degrees. They are highly active in small and micro-enterprises of designer goods, agro and processed food sectors.

Female SME owners engaged in designer goods, and agro and processed food sectors have been observed to be actively adopting ICT tools for sales and marketing. A huge number of them regularly use social media platforms to communicate with clients, ecommerce platforms to sell their goods, and e-logistics platforms to deliver goods to their clients. From the primary study, it has been found that female SME owners are more willing to participate in training and more interested to use ICT tools for their day-to-day business operations. In the manufacturing process neither male nor female owners are observed to have a higher ICT adoption tendency.

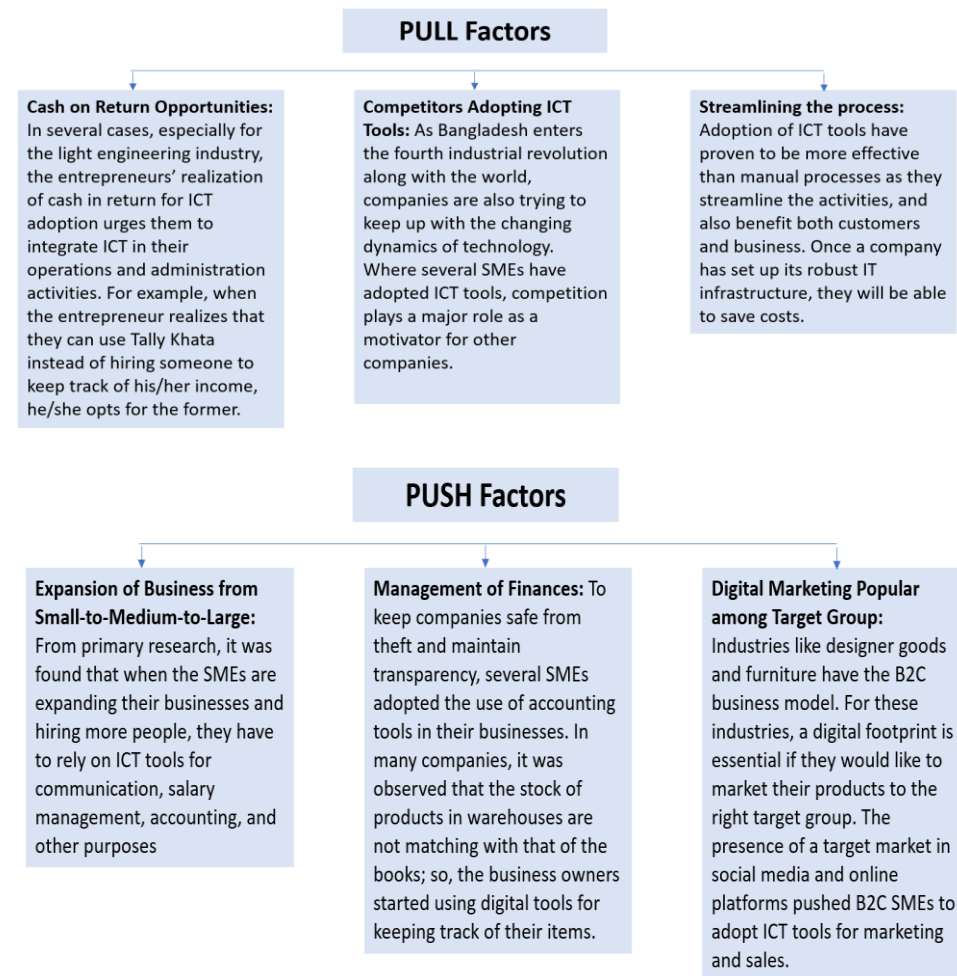
In case of medium and semi-large sized enterprises, the presence of female owners have not been noticed. Moreover, it has been observed that as the size and operational complexity of the enterprises grow so does the nature of ICT tools and complex ICT tools are mostly used by males.

4.3 Driving Factors of ICT Adoption in SMEs

There are several driving factors for SMEs in Bangladesh to adopt ICT in their businesses. ICT tools can provide different benefits across a wide range of inter and intra firm business operations and transactions. Certainly, these applications are able to contribute to improving information and knowledge management in the firm itself and reduce transaction cost along with increasing the speed and reliability for B2B and B2C transactions. Additionally, these tools are effective for improving external communication and services to the new customers. SMEs are driven by the following factors for ICT adoption.

4.3.1 Push-Factors

In this context, push factors are mostly the internal factors that provides thrusts or incentives to SMEs to adopt ICT tools. From the primary study, it is observed that push factors among Bangladeshi SMEs are created due to growth, managing the financial growth and sustaining or facilitating the growth through marketing.



4.3.2 Pull-Factors

On the other hand, pull factors are mostly external factors that attract the SMEs to adopt ICT tools. Among Bangladeshi SMEs they were mainly due to pressure from competitors and resource optimization or saving cash burn.

4.4 Existing National Policies Impacting ICT Adoption

Government, policy stakeholders, private sectors and development organizations are increasingly working to put necessary policies and guidelines to make the SME sector structured, and align with the development goal of Bangladesh to be a developed nation by 2041. SMEs grow with the help of multiple components in

the business-industrial and academic ecosystem. So, the policy support is also a multi-pronged issue.

The study team has found that a large number of the policies do not provide any specific directions for SMEs or business in general. Particularly, the educational policies lack any linkage of local TVET (technical and vocational education and training) centers to support the local business/SMEs, as lack of technical knowledge is a serious issue in SME development. Also, it is observed that national educational policy 2010 (Ministry of Education, 2010) provides some directions to have industry and academia collaboration. But it lacks any suggestion on industry demand-based education, as many Bangladeshi students face challenges that their education has little or no demand in the local market. Moreover, businesses regularly struggle to find necessary talents to hire.

Also, in the National Skill Development Policy 2011(National Skills Development Authority, 2014), it gives general directions for SMEs to provide capacity development training for the workers at the workplace. But from field observation, TVET centers or educational institutions do not cater to the local businesses' skills or workforce requirements. Connecting skills development policy and SME policy to mitigate that challenge would be very helpful for SME sectors in general.

In general, policies are not designed to provide incentives to SMEs to adopt ICT tools, infrastructure, technical manpower, etc. Also, without proper data and metrics to track ICT adoption in SMEs, Bangladesh cannot measure and strategize its ICT adoption policies for SMEs.

Below we have discussed several policies in Bangladesh related to ICT and SME or business development in general.

Table 6: Act and Policy Impacting ICT Adoption in SMEs of Bangladesh

Policy/Act/Law	Aspects Supporting ICT Adoption in SMEs	Weakness or Gaps in Supporting ICT Adoption in SMEs
Bangladesh National ICT Policy-2018 (Information and Communication Technology Division, 2018)	Section 4.3 of ICT policy states that, “Updating the syllabus in line with workplace needs and enhancing collaboration between educational institutions and industries.”	This particular policy has no direction to provide ICT training based on industry needs, and lacks directions of the ICT training infrastructure based on the localized needs of the SME clusters. Moreover, it does not specifically address how to increase the collaboration.
	Section 6.5 of ICT policy states that, “Creating the Necessary Environment to Encourage the Use of Information Technology in	In this specific case, if one wants to promote the usage of commercial off the shelf (COTS) software in SMEs, the specific action will be diverse. It is

Policy/Act/Law	Aspects Supporting ICT Adoption in SMEs	Weakness or Gaps in Supporting ICT Adoption in SMEs
	<i>Trade”.</i>	noted here that although COTS software is widely available, these are not used in many SMEs due to lack of digital literacy among the employees of SMEs and improper after-sales support by the local software companies.
National Digital Commerce Policy-2018 (WTO Cell, 2019)	Section 3.1.2 of National Digital Commerce Policy states that, “ <i>In conducting digital commerce, companies shall comply with the existing rules and regulations of the country.</i> ”	However, there are no traditional rules and regulations for digital commerce in Bangladesh. This may indicate compliance of any rules and regulations when doing digital commerce. Therefore, confusion remains as to what will be followed by the businesses.
Digital Security Act-2018 (Legislative and Parliamentary Affairs Division, 2019)	Section 19 (e) (1) of Digital Security Act 2018 states that, “ <i>If a person intentionally produces or markets spam, or attempts to do so, or sends unsolicited mail, for the purpose of marketing a product or service, without the consent of the sender or the customer, such person shall be liable for the act and it will be considered a crime.</i> ”	The law does not identify what sort of marketing emails are allowed for corporations and SMEs. In several cases, SMEs and organizations send email to their contacts without taking permission, whether this is a crime and on what ground is not identified.
SME Policy 2019 (Ministry of Industries, 2020)	Section 4.6.3.1 of SME Policy 2019 states that, “ <i>Provide training to individual entrepreneurs on freelancing.</i> ”	However, SME entrepreneurs are not freelancers in general. Therefore, it is unclear as to what they will do with freelancing training.
National Industrial Policy 2016 (Ministry of Industries, 2016)	Section 5.2.3 of National Industrial Policy 2016 states that, “ <i>Training for entrepreneurs will be continuous to enhance their capabilities as well as market connectivity and market expansion activities will continue.</i> ”	The policy is very broad and does not focus on what skills to acquire for the founders along with what kind of training will be provided for the entrepreneurs.

VAT and Income Tax Issues

VAT and tax are costly to bear for SMEs in Bangladesh. There are issues like double VAT charges where VAT is applied during purchase of raw materials and again on sales of finished goods. As VAT is added in two instances, the seller must ask for higher prices from customers, which in turn, reduces the demand for that certain product in the market (Khalily, Shariat-Ullah, & Tareq, 2019). This

particular policy also leads to lack of transparency among SMEs in accounting practices, and they tend to hinder the adoption of ICT tools related to accounting and finances in fear of being exposed to VAT-Tax officials with the actual production and sales.

The issue was raised to the representatives of the NBR and the Ministry of Industries. The NBR is working hard to correctly identify all the business transactions across industries. As per the opinion of the NBR representatives, if identification of all the transactions could be done accurately, the issue will be resolved. The SMEs can claim for tax rebate when such a situation (double taxation) has been raised. The NBR has already introduced EFD (Electronic Fiscal Device) for organizations, which is a device-centric solution to address the VAT issue for an organization. Moreover, NBR is trying to come out of the device-centric approach and adopt a cloud-centric approach as the solution which will be scalable for a large number of organizations efficiently. The representatives of the Ministry of Industries inform that they are aware of this issue and are negotiating with the NBR and the business leaders to come up with an acceptable solution. They hope to address this issue in the upcoming national industry policy.

5. Recommendations

From the study the authors have realized that there are three major broader bottlenecks, which are,

- i. Issues related to VAT/tax policy,
- ii. Access to affordable and inclusive public and private ICT solutions, and
- iii. Lack of capacity in SMEs to adopt ICT tools.

We have formulated recommendations based on these broader issues.

5.1 VAT/Tax Issue Related Strategic Recommendations (VISR)

VISR 01: Provide Tax Incentives for ICT related Investment			
Core Provisions	Possible Lead for Implementation	Ecosystem Outcome	Impacted Sectors
SMEs pay VAT twice; during import and when making a sale. The VAT/TAX policies can be revised to provide incentives to SMEs who adopt ICT tools in their financial and other business-related	<ul style="list-style-type: none"> ● ICT Division ● Ministry of Industries ● NBR 	-SMEs will align their incentive with ICT investment. -Adoption of ICT tools in financing and accounting management to increase transparency. - Gradual adoption of ICT tools in other business management systems to increase efficiency.	All sectors

management systems.			
Description: Benefits from ICT investments spill over to the suppliers, competitors, and customers. A growing number of nations provide tax incentives for ICT investment. Bangladesh should provide incentives such as accelerated depreciation for ICT investments, tax rebate for employees training programs, tax incentives not only for ICT equipment but also for software to boost ICT adoption among SMEs.			
VISR 02: Provide Tax Incentives for hiring technical talent and training of existing employees.			
Core Provisions	Possible Lead for Implementation	Ecosystem Outcome	Impacted Sectors
SMEs lack technical talents and most of the time lacks incentive to hire relatively expensive technical talents. By this policy a bridge to connect academia and industry will be established.	<ul style="list-style-type: none"> ● ICT Division ● Ministry of Industries ● NBR ● Ministry of labor. 	-SMEs will align their incentive with hiring technical talents or upgrading skills of their existing employees. -Adoption of this policy will help tertiary educated and vocational-technical graduates to land jobs in SMEs and help to reduce the unemployment rate.	All sectors
Description: Providing tax incentives for hiring technical talent and training of existing employees in SMEs can be mutually benefitting for both SMEs and the government. On one hand, it will encourage SMEs to invest in ICT tools as their expenses will be reduced and their organizational capacity will increase; on the other hand, the unemployment of highly educated technical talents will decrease. The method of VAT/TAX payment and incentives for this policy also needs to be streamlined and easy to understand. The present system is difficult to understand for many, including the SMEs.			

5.2 Development of Inclusive ICT Service Ecosystem Strategic Recommendation (DISESR)

DISESR 01: Increased Awareness and Access to Digital Government Services.			
Core Provisions	Possible Lead for Implementation	Ecosystem Outcome	Impacted Sectors
Government is spearheading some fundamental digital government services, but most SMEs need to be aware of them or have easy access to these digital services.	<ul style="list-style-type: none"> ● ICT Division ● a2i ● Ministry of Industries 	-SMEs will interact digitally to get government services and business credentials, i.e. trade license, TIN, which will expedite the business operations and forces SMEs to learn basic know-how regarding ICT -SMEs will feel comfortable to use ICT tools in their business operation	All sectors
Description: Digitization of loan schemes, VAT/TAX payment (through app), and other government services will make the administrative system easier for SMEs, and reduce their cost as well. Digitizing the systems will also encourage SMEs to learn the digital methods of completing these processes.			

DISESR 02: Knowing the nature of ICT services required for individual industry			
Core Provisions	Possible Lead for Implementation	Ecosystem Outcome	Impacted Sectors
Development of system requirement documents for different business operations in each industry.	<ul style="list-style-type: none"> Industry associations BSCIC Ministry of Industries SMEF 	-Increase the availability of the required ICT services, which in turn promote business growth - Increase ICT adoption	All sectors: Manufacturing, service, and Agro & Processed Food will be able to get customized software.
Description: SMEs in Bangladesh are very dynamic and they will not fit into any “one size fits all” model for ICT adoption. Needs of different industries for similar business operations vary significantly, and so ICT tools and services also need to be customized for each sector. So, the facilitating organizations need to understand industry-specific requirements of ICT tools to improve ICT adoption in SMEs.			
DISESR 03: Customized (based on individual sector’s need) and inexpensive ICT solutions for SMEs			
Core Provisions	Possible Lead for Implementation	Ecosystem Outcome	Impacted Sectors
Development of low-cost customized accounting software, business management software, marketing tools, and training modules for employees	<ul style="list-style-type: none"> Startups IT/ITES companies Local digital marketing service providers Ministry of Industries 	-Customized software will help the SMEs in adoption of ICT tools -The employees will be trained easily with customized software	All sectors: Manufacturing, service, and Agro & Processed Food will be benefited from customized software.
Description: As the customized ICT tools are introduced for different industry SMEs, it is important that software are affordable, so that small entrepreneurs can afford them. The benefits of introducing affordable ICT solutions would be easy training for the employees, and quicker adoption of ICT for the SMEs.			

DISESR 04: Local IT entrepreneurs serving local SME clusters			
Core Provisions	Possible Lead for Implementation	Ecosystem Outcome	Impacted Sectors
Policy level support for local IT entrepreneurs and Tax benefits for both IT entrepreneurs and SMEs	<ul style="list-style-type: none"> Startups IT/ITES companies ICT Division Ministry of Industries NBR 	-Low cost of ICT products and services for SMEs -Money stays within the local economy	-All sectors
Description: When local SMEs take services from local ICT service providers, the money stays within the local economy, and the businesses will be allowed to flourish, making a sustainable system. The local ICT service providers will also be able to provide low cost services, which in turn benefits the SMEs further.			

DISESR 05: Introduction of certified ICT service providers for SMEs			
Core Provisions	Possible Lead for Implementation	Ecosystem Outcome	Impacted Sectors
Trust is an issue for several SMEs. Certification of ICT service providers will help in gaining trust of local SMEs.	<ul style="list-style-type: none"> ICT Division BASIS Academic Institutes e-CAB 	Willing SMEs who are now challenged with trusting the local ICT service providers will use ICT services when this recommended action is executed.	-All sectors
Description: Although SMEs will be benefited by taking services from the local IT service providers, there are certain trust barriers to this solution. Certifying the IT companies might allow them to gain the trust of local SMEs.			

DISESR 06: ICT fairs for connecting SME owners with ICT solution providers			
Core Provisions	Possible Lead for Implementation	Ecosystem Outcome	Impacted Sectors
-Physical ICT fairs -Can be included in SME fair	<ul style="list-style-type: none"> SME Foundation Bangladesh ICT Division 	IT fairs will educate several SME owners about IT products that could benefit them.	All sectors
Description: To further establish a relationship of trust and reliability between local IT companies and SMEs, an ICT fair focusing on the SMEs can be introduced. The SME fair is a yearly event in Bangladesh, IT companies may advertise their products in this fair as well.			

DISESR 07: Benchmark ICT Use among SMEs			
Core Provisions	Possible Lead for Implementation	Ecosystem Outcome	Impacted Sectors
-Track ICT adoption metrics among SMEs. - Track ICT usage among households.	<ul style="list-style-type: none"> SME Foundation Bangladesh ICT Division BASIS 	- Bangladesh government and relevant policy stakeholders can track the progress and take evidence-based decisions to formulate ICT adoption strategies both for SMEs and the general public.	All sectors
Description: Bangladesh cannot manage if it does not measure the ICT adoption among SMEs and households. The Bangladesh government with the help of SMEF, BASIS, and ICT Division shall measure ICT adoption among SME. They shall track some of the metrics like- number of companies with a website, quantity of ICT capital investment, number of technical manpower, etc.			
Bangladesh has already conducted one national ICT household survey in 2018-19 ⁵ . In the future, ICT household surveys shall include metrics like- amount of e-commerce purchase, use of online banking services, mobile financial services, usage of phone calls and internet data from telecom companies, etc. These shall be done regularly and the findings shall be triangulated with the SME ICT adoption survey in the near future.			

⁵ https://a2i.gov.bd/wp-content/uploads/2020/04/Top-Line-Report_Bangladesh-National-ICT-Household-Survey.pdf

5.3 Capacity Development of SMEs in ICT related Strategic Recommendation (CDSISR)

CDSISR 01: Conduct behavioral change campaign/training & Training for ICT Capacity Development of SMEs.			
Core Provisions	Possible Lead for Implementation	Ecosystem Outcome	Impacted Sectors
SMEs lack understanding of the value provided by ICT adoption, and have issues with perceived ease of use of ICT tools. Before technical capacity development they require capacity development related to these behavioral issues.	<ul style="list-style-type: none"> • SMEF • BSCIC • Industry associations • a2i/Muktopaath • Bilateral and multi-lateral organizations, • Donors or Foundations 	<ul style="list-style-type: none"> • SMEs will understand the value of adopting ICT tools in their business processes. • SMEs will overcome the fear of using ICT tools. 	<ul style="list-style-type: none"> -The B2C industries will be impacted greatly for marketing and sales -The B2B industries will have better management and accounting processes
<p>Description: Before providing capacity development training to SMEs, they require training to tackle some behavioral issues related to lack of understanding of value proposition by ICT tools and fear of using ICT tools. Then they shall be provided with technical training.</p> <p>SMEs require training in using basic ICT tools, along with accounting, management, and digital marketing tools. Their outcome from this training would be removal of bottlenecks in marketing and sales, along with improvement in business processes and accounting which would eventually result in higher profit for the companies. The chain reaction may start with the SME owners, and then the employees can be trained. Different approaches can also be adapted based on the company's business model.</p>			

CDSISR 02: Development of vocational training centers to serve local SMEs or SME clusters			
Core Provisions	Possible Lead for Implementation	Ecosystem Outcome	Impacted Sectors
Vocational training centers based on local needs. (For example: teaching SME owners of Tangail how to search and design online)	<ul style="list-style-type: none"> • BTEB • SME Foundation Bangladesh • Industry associations 	Different locations in Bangladesh specialize in different things, and focusing on this aspect will result in effective solutions.	All sectors
<p>Description: Vocational training has always been a practical and fast approach for adoption of anything new. The training centers will improve the knowledge and expertise of SMEs in several locations of Bangladesh, and may even inspire others to open their own businesses.</p>			

6. Conclusion

This study presents findings on the ICT adoption in SMEs of Bangladesh. The majority of the SMEs in Bangladesh have a low or basic level of ICT adoption. It was found that ICT adoption was more in the service sector compared to that of

the manufacturing and agro and processed food sectors. Industries in the service sector are using ERP solutions and Vehicle Tracking Systems, whereas the majority of industries in manufacturing and Agro and Processed Food sectors are using Microsoft Excel for accounting management.

The study identifies several factors and challenges for ICT adoption in SMEs of Bangladesh. Expansion of business, management of finances, and the demand of digital marketing act as the push factors for several SMEs to adopt ICT tools in their business operations. Cash on return opportunities, competition, and the opportunity of streamlining processes through ICT tools are the pull factors for several SMEs to adopt ICT tools in their business activities. The study recommends building a self-sustainable environment for the SMEs in Bangladesh. To be self-reliant, the SMEs require capacity development training in various aspects. Along with training, they require ICT tools that are catering to their needs. The SMEs also need inexpensive ICT services, and this is found to be a great opportunity for the local ICT service providers, who are also small businesses, to provide ICT services to the SMEs. The study finds that there is a lack of trust between the SMEs and local ICT service providers and suggests the need for certification. Introducing certified ICT service providers will create a trustworthy environment and allow the SMEs to enter the digital world. Another finding of the study is the governmental bottlenecks for the SMEs, such as complicated VAT/TAX processing systems and the presence of high VAT/TAX for these small businesses. Revision of VAT/TAX policy is essential for smoothening the path towards digitization of SMEs in Bangladesh.

SMEs are the vital parts of the economic development of Bangladesh. Our economy is as good and robust as the state of our SMEs. Bangladesh will not be one of the key economies in the age of the fourth industrial revolution unless its industries adopt technological solutions. Technological tool adoption generally happens in two stages; first the industries adopt shallow and relatively cheap tech solutions like (IT/ICT tools), and then they adopt resource intensive deep technological solutions (AI, cyber-security, robotics, etc.). Unless Bangladeshi SMEs or industries adopt simple IT/ICT tools, they will not be able to be part of the fourth industrial revolution. Moreover, ICT adoption among industries happens in phases. First, they get accustomed to basic communication tools (mobile phones, email, website) and then gradually move up to complicated ICT solutions (ERP, CRM, advanced financial software, etc.). Unless significant numbers of SMEs adopt simple ICT tools, the SME sector as a whole will not graduate upwards in terms of ICT adoption.

Finally, policy stakeholders and ecosystem-enabling organizations need to understand that ICT adoption among SMEs will not happen unless these policies help to create a conducive environment of 360-degree development for SMEs. Policies and programs need to be supported from a human capital or capacity development perspective. In addition, cheap and scalable digital infrastructure, SME friendly Tax/VAT policies, implementation of regulations, etc. have to be ensured. ICT adoption is just one of the vital components of this complicated musical orchestra. Unless other components play their role, it will be a challenge for Bangladesh to see a beautiful symphony of SME development in the coming years.

Acknowledgement

The authors acknowledge the support of the SME Foundation Bangladesh and the Friedrich-Ebert-Stiftung (FES) Bangladesh to conduct the study. The financial support and the scholarly comments from both the organizations have made the study complete and successful.

References:

- Abdin, M. J. (2019). MSMEs - Both a Choice and a Reality for Bangladesh. *The Financial Express*.
<https://www.thefinancialexpress.com.bd/views/msmes-both-a-choice-and-a-reality-for-bangladesh-1566055028>
- Arefin, S., & Rahman, M. T. (2020). Information Communication Technology (ICT) Enable Services Adoption by SMEs for Business Sustainability: A Study from Bangladesh Perspective. *Sumedha Journal of Management*, 9(3), pp. 1-21. DOI: 10.46454/sumedha/9.3.2020.1
- Asian Development Bank (2021). Asian Development Bank (ADB) Asia SME Monitor 2021. ADP, Philippines. <https://data.adb.org/media/9026/download>
- Azam, M. S., & Quaddus, M. (2009). Adoption of B2B e-commerce by the SMEs in Bangladesh: An Empirical Analysis. In *Proceedings of Asian Business Research Conference*, 11-12.
- Chakravorti, B., Bhalla, A., & Chaturvedi, R. S. (2020). Which Economies Showed the Most Digital Progress in 2020? *Harvard Business Review*
- Digital Adoption Index (2016). Digital Adoption Index (DAI): Measuring the Global Spread of Digital Technologies, *World Development Report 2016*, World Bank.
<https://www.worldbank.org/en/publication/wdr2016/Digital-Adoption-Index>
- Haque, M. M., & Ahlan, A. R. (2018). Can ICT reduce poverty and unemployment and elevate development integrating micro, small, and medium enterprises in Bangladesh? - Sharing ASIAN experiences. *International Journal of Engineering and Management Research (IJEMR)*, 8(4), 168 - 174, Print ISSN: 2394-6962, Online ISSN: 2250-0758, DOI: 10.31033/ijemr.8.4.21.
- Hossain, M., & Chowdhury, T. T. (2022). COVID-19, Fintech, and the Recovery of Micro, Small, and Medium-Sized Enterprises: Evidence from Bangladesh. ADBI Working Paper 1305. Tokyo: Asian Development Bank Institute.
- Hoque, M., Saif, M., Naser, A., Albar, A., & Bao, Y. (2016). Adoption of Information and Communication Technology for Development: A Case

- Study of Small and Medium Enterprises in Bangladesh. Information Development, 32, 986-1000. DOI: 10.1177/0266666915578202.
- Information and Communication Technology Division. (2018). National ICT Policy-2018. Ministry of Posts, Telecommunications and Information Technology, People's Republic of Bangladesh.
<https://www.cirt.gov.bd/wp-content/uploads/2019/11/ict-nitimala-2018.pdf>
- Islam, M., & Nasira, S. (2017). Role of Technology on Development of SME: Bangladesh Perspective. Journal of Entrepreneurship and Management, 6(1).
- ITU. (2017). ITU ICT Development Index (2017), ITU. <https://www.itu.int/net4/ITU-D/idi/2017/index.html>
- Karim, S., & Gide, E. (2019). The Challenges and Opportunities of E-banking adoption for SMEs in Bangladesh. Global Journal of Information Technology: Emerging Technologies, 9(1), 1–11. <https://doi.org/10.18844/gjit.v9i1.3758>
- Khalily, B., Shariat-Ullah, M., & Tareq, M. (2019). Development of SMEs in Bangladesh: Lessons from the German Experience. SME Foundation and Friedrich-Ebert-Stiftung, Bangladesh.
- Legislative and Parliamentary Affairs Division. (2019). Digital Security Act, 2018. Ministry of Law, Justice and Parliamentary Affairs, People's Republic of Bangladesh.
<https://www.cirt.gov.bd/wp-content/uploads/2020/02/Digital-Security-Act-2020.pdf>
- Lightcastle Analytics Wing. (2021). Digital Financial Services in Agriculture and MSME Sectors. Lightcastle Partners. <https://www.lightcastlebd.com/insights/2021/06/digital-financial-services-in-agriculture-and-msme-sectors/>
- Ministry of Education. (2010). National Educational Policy 2010. Ministry of Education, People's Republic of Bangladesh.
<https://moedu.gov.bd/site/page/318a22d2-b400-48a7-8222-303ab11cc205/National-Education-Policy-2010->
- Ministry of Industries. (2020). SME Policy 2019. Ministry of Industries, People's Republic of Bangladesh.
- http://www.moind.gov.bd/sites/default/files/files/moind.portal.gov.bd/policies/a4393af4_ff92_4517_847f_952a3bc347f3/SME%20Policy%202019.pdf
- Ministry of Industry. (2016). Industrial Policy 2016, Ministry of Industries, People's Republic of Bangladesh.
- Miraz. M. H., Habib, M. M. (2016). ICT Adoption in Small and Medium Enterprises: An Empirical Evidence of Service Sectors in Bangladesh. Journal of Business Economics and Management, 4 (8), DOI:10.18178/joebm.2016.4.8.439
- National Skills Development Authority. (2014). National Skills Development Policy, 2011. Prime Minister's Office, People's Republic of Bangladesh.
https://nsda.portal.gov.bd/sites/default/files/files/nsda.portal.gov.bd/page/79fe610e_04d6_4409_8331_1578b9a0e1d1/2020-02-27-12-44ed3af7624fb505e78c7a9c336b81068a.pdf
- Rahman, I., & Kabir, M. R. (2020). Benefits and Challenges of Cloud ERP Adoption by SMEs. Journal of Business Administration, 41(1), 23-39
- Rahman, M. M., & Khondkar, M. (2020). Small and Medium Enterprises (SME) Development and Economic Growth of Bangladesh: A Narrative of the Glorious 50 Years. Barishal University Journal of Business Studies, 7 (1), 9 - 24
- Willcocks, L., Sauer, C., Feeny, D., Basu, C., & Moore, K. (2000). Moving to E-business: The Ultimate Practical Guide to Effective E-Business. Random House, ISBN: 978-0712669832
- WTO Cell. (2019). National Digital Commerce Policy-2018. World Trade Organization (WTO) Cell, Ministry of Commerce, People's Republic of Bangladesh.
https://mincom.gov.bd/sites/default/files/files/mincom.portal.gov.bd/page/4bc0ec05_a678_4915_b199_d656057b114e/National%20Digital%20Commerce%20Policy-2018.pdf