



Information and Communication Technology (ICT) Adoption of SMEs in Bangladesh:

Present Scenario, Challenges
and Way Forward



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Table of Contents

Acknowledgement	i
Table of contents	iii
List of tables	v
List of Figures	v
List of abbreviations	vi
Executive summary	viii
1. Introduction	1
1.1 Status of SMEs in Bangladesh	1
1.2 Availability of ICT Services	4
1.2.1 Government Initiatives	4
1.2.2 Bangladeshi Private Sector Initiatives	6
2. Methodology	9
2.1 Literature Review	9
2.2 Data Collection	10
2.3 Data Analysis	12
2.4 Limitations of Study	12
3. ICT Adoption in SME Sectors: Current Scenario and Impacting Factors	13
3.1 Current ICT Adoption in SMEs in Bangladesh	13
3.1.1 Manufacturing	15
3.1.2 Operations/Order Management	15
3.1.3 Financial/Accounting Management	16
3.1.4 Marketing and Sales	16
3.2 Analysis of Current ICT Adoption in SMEs in Bangladesh	17
3.2.1 SWOT Analysis of Bangladeshi SMEs to Adopt ICT Tools	19
3.2.2 ICT Adoption among Women-led SMEs	24
3.3 Driving Factors of ICT Adoption in SMEs	25
3.3.1 Push-Factors	25
3.3.2 Pull-Factors	26
3.4 Existing National Policies Impacting ICT Adoption	26

4. Case Studies of ICT Adoption in SMEs: Performance Before and After ICT Adoption	30
4.1 Case Study: ICT Adoption in the Plastics Industry	30
4.2 Case Study: ICT adoption in Agro and Processed Food Industry	32
4.3 Case Study: ICT adoption in Light Engineering Industry	34
5. Global ICT Adoption in SMEs: Factors, Policy Trends and Opportunities	36
5.1 Factors of ICT Adoption in SMEs	36
5.2 Trends in Policy to Boost ICT adoption in SMEs	38
5.3 Global Tech Solutions to Boost ICT Adoption in SMEs	41
6. Challenges of ICT Adoption in SMEs	44
6.1 Challenges for SMEs in ICT Adoption	44
6.2 Challenges for SMEs in General	45
7. Recommendations and Conclusion	47
7.1 Strategic Recommendations	47
7.1.1 VAT/Tax Issue-related Strategic Recommendations (VISR)	47
7.1.2 Development of Inclusive ICT Service Ecosystem Strategic Recommendations (DISESR)	49
7.1.3 Capacity Development of SMEs in ICT-related Strategic Recommendations (CDSISR)	53
7.2 Conclusion	54
References	56
Annexes	59
A. Contacts of the Interviews-Associations	59
B. Contacts of the Interviews-SMEs	61
C. Objectives and Questions	64
D. FGD Details	68
E. Sector-wise Breakdowns of the KIIs and FGDs	69
F. Overview of the Major Sectors	69

List of Tables

Table 1: State of the Art ICT Tools used in Different Business Processes	13
Table 2: ICT Tools Usage across Bangladeshi SMEs/Industries	14
Table 3: Defining Different Levels of ICT Adoption	17
Table 4: Heatmap of observed ICT levels in Bangladeshi SMEs	19
Table 5: Factors and Challenges of SME Sectors in ICT Adoption	21
Table 6: Act and Policy Impacting ICT adoption in SMEs of Bangladesh	27
Table 7: Global Tech Solutions for SMEs	41

List of Figures

Figure 1: Concepts of 4th Industrial Revolution	1
Figure 2: Moving to E-business Framework (Willcocks et al., 2000)	18
Figure 3: SWOT Analysis of SMEs in Bangladesh	20
Figure 4: Tax Incentives for ICT and R&D Investment in CEE countries, February 2020	40



List of Abbreviations

A2i	Aspire to Innovate
ADB	Asian Development Bank
ASEAN	Association of South-East Asian Nations
B2B	Business to Business
B2C	Business to Consumer
BAPA	Bangladesh Agro-Processing Association
BASIS	Bangladesh Association of Software and Information Services
BDT	Bangladeshi Taka
BGMEA	Bangladesh Garment Manufacturers and Exporters Association
BSCIC	Bangladesh Small and Cottage Industries Corporation
BTEB	Bangladesh Technical Education Board
CAD	Computer-Aided Design
CAM	Computer Aided Manufacture
CDAP	Canada Digital Adoption Program
CEE	Central European Countries
CGRS	Central Grievance Redress System
CIM	Computer Integrated Manufacture
CIT	Corporate Income Tax
CLTP	Central Logistics Tracking Platform
CoD	Cash on Delivery
COTS	Commercial off the shelf
CRM	Customer Relationship Management
DGDA	Directorate General of Drug Administration
E&E	Electrical and Electronics
e-CAB	E-Commerce Association of Bangladesh
efd	Electronic Fiscal Device
EPoS	Electronic Point of Sale
ERP	Enterprise Resource Planning
FES	Friedrich-Ebert-Stiftung
FGD	Focus Group Discussion
FY	Fiscal Year
GDP	Gross Domestic Product

ICT	Information and Communication Technology
IoT	Internet of Things
IT	Information Technology
ITES	Information Technology Enabled Service
ITU	International Telecommunication Union
KII	Key Informant Interview
LEP	Light Engineering Products
MoHFW	Ministry of Health and Family Welfare
MSME	Micro, Small and Medium Enterprise
NBR	National Bureau of Revenue
NGO	Non-Government Organisation
P&E	Plant and Equipment
PaaS	Platform as a Service
PoS	Point of Sale
R&D	Research and Development
RMG	Ready-Made Garment
RPM	Rapid Prototyping and Manufacturing
SCM	Supply Chain Management
SME	Small and Medium Enterprises
SMEF	Small and Medium Enterprises Foundation
TVET	Technical and Vocational Education Training
UBID	Unique Business Identity
UISC	Union Information and Service Centre
UNDP	United Nations Development Program
USD	United States Dollar
VAT	Value Added Tax
VTs	Vehicle Tracking System

Executive Summary

With a population of 165 million¹, Bangladesh has one of the biggest consumer markets in the world, and the Small and Medium Enterprises (SMEs) of Bangladesh are an integral part of the economy that directly creates approximately 7.86 million jobs. Despite the thriving economic progress, SMEs in Bangladesh have experienced slow ICT adoption in different sectors. Bangladesh's business sector has a digital adoption index of 0.35/1, which indicates that the business sector in Bangladesh is lagging behind in digitisation. This study aims to find the current scenario and critical issues of ICT adoption in Bangladeshi SMEs. Both primary and secondary research is used in formulating the study. Key informant interviews and focus group discussions are used in primary data collection. The study chose an appropriate number of industries from major SME sectors and identified ICT adoption levels among common business processes in those industries, for example, manufacturing, order management, accounting management, human resource management, marketing and sales. There have been different trends of ICT adoption observed amongst the sectors.

The plastic industry in the manufacturing sector is found to have more frequent usage of ICT tools. Other industries in the manufacturing sector are observed to have limited use of ICT tools. Some of them use generic tools like excel for accounting and e-commerce sites for order management and marketing. Although e-commerce sites and MS Excel are good software for managing money and order, as the company expands, that software quickly becomes inadequate for the growing complex needs of the businesses. There have also been regular use of ICT in the service sector across many business processes, where some logistics companies are using tools like vehicle tracking systems, and health industry uses Enterprise Resource Planning software.

The study identifies several factors and challenges for ICT adoption in SMEs in Bangladesh. Expansion of business, management of finances, and the demand for digital marketing pushed 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. Study findings have provided reasons for the inability to adapt ICT in business among bus 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.

¹Bangladesh Population Census 2022

are a few prominent causes of being behind in ICT adoption by SMEs in Bangladesh. The study also presents three case studies that clearly show the benefits of ICT adoption in SMEs in Bangladesh.

The study includes research on policies related to SMEs and digital commerce in Bangladesh. Many of these policies are disconnected from 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 is inadequate compared to the comparator's complexity, and the digitised processes are deemed too difficult for SMEs to adopt. In some cases, the policies do not clarify what type of activities concerned the said policies. The study critically analyses the factors and policy trends to boost ICT adoption in global SMEs and has formulated some recommendations such as reforming VAT policies to incentivise ICT adoption among SMEs, identifying the ICT service requirements among different industry sectors and ensuring the availability of those services in the local market, establishing customised training modules for the SMEs along with ensuring services for their management systems.



01

Introduction

1.1 Status of SMEs in Bangladesh

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

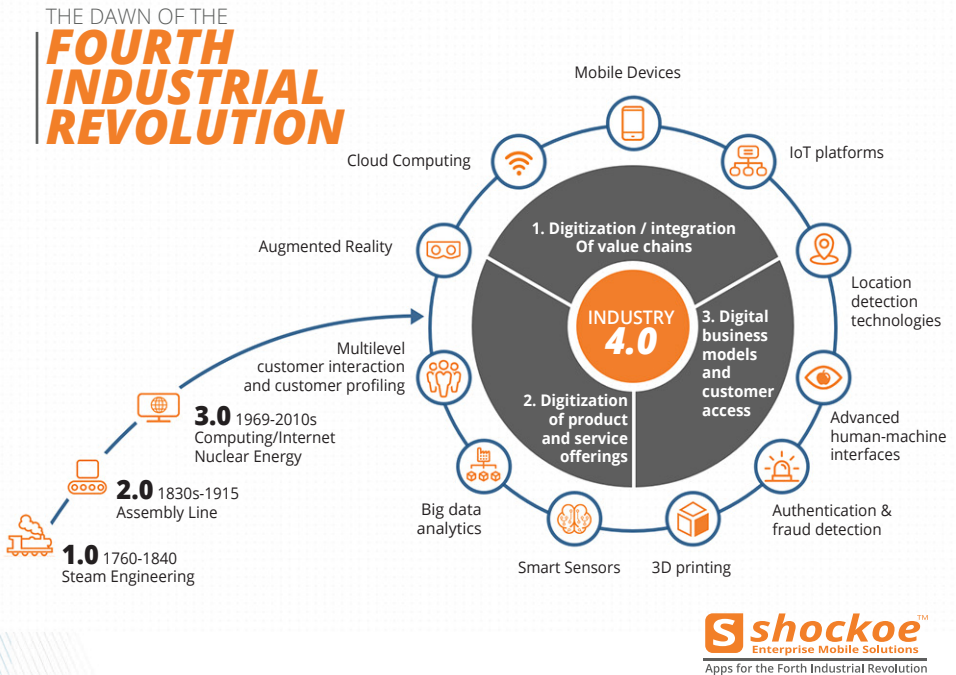


Figure 1: Concepts of the 4th Industrial Revolution²

²Image Source: Shockoe

(<https://www.weforum.org/agenda/2019/01/the-fourth-industrial-revolution-needs-new-forms-of-leadership/>)

Bangladesh, a fast-developing country, does not have all aspects of the fourth industrial revolution. To fully adopt the components of fourth industrial revolution, the majority of the Bangladeshi businesses and industries first need to adopt technological components of the third industrial revolution like- ICT tools, internet-based services, etc. In the last two decades, the ICT and internet infrastructure expansion, Bangladesh has observed a varied degree of digitisation in the business processes across all industries. Digitisation/ integration of value chains, digitisation of products and service offerings, digital business models and customer access through digital platforms are the three main components of this stage in digitisation. But 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 SMEs are yet to adapt ICT tools into their day-day business. Cloud computing, authentication and fraud detection, location detection technologies, augmented reality, big data analytics, IoT-enabled devices, etc. are some of the integral parts of the fourth industrial revolution. However, most of these technologies are used by some of the leading businesses in Bangladesh; still, they are only used by some mainstream business entities or SMEs. Some mainstream business entities or SMEs only use them.

SMEs of Bangladesh are an integral part of the economy. As more companies enter 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, SMEs 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 economic progress, SMEs in Bangladesh have experienced slow ICT adoption in its different sectors. Bangladesh's business sector has a digital adoption index of 0.35/1, which indicates that the business sector in Bangladesh is lagging behind in digitisation (Digital Adoption Index, 2016). Also, on the bright side, Bangladesh is also rising as one of the "break-out" economies that is rapidly digitising its economy (Chakravorti, 2020).

Both service and manufacturing SMEs are expanding their businesses rapidly using innovative technologies. But, many SMEs in Bangladesh, especially in the light engineering sector, are unable to fully utilise 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 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 of its of having full-fledged SMEs with good ICT infrastructure.

With this backdrop, in collaboration with Friedrich-Ebert-Stiftung (FES) Bangladesh, SME Foundation has commissioned this study to find the current scenario and critical issues of ICT adoption in Bangladeshi SMEs. In the study ICT adoption was measured according to ICT-based tools usage in various business operations of the organisation, for example, order management, accounting management, human resource management, marketing and sales. The study focused on the success factors for efficient adoption of the ICT in SMEs and looked into the extent of the impact of ICT adoption of SMEs and their coping mechanisms.

Key Definition

ICT & ICT Adoption

According to a definition of the European Commission (EC), Information and Communication Technology (ICT) is defined as to digitise information and integrating systems at all stages of product creation and use (including logistics and supply), both inside companies and across company boundaries.

SMEs

The definition of small enterprises and medium enterprises differ according to their size and assets. The definitions, according to the Ministry of Industries, are provided below:

I. Small Enterprises

- Manufacturing: In manufacturing, small industries/enterprises would be those with assets worth BDT 75 lakh to 15 crores and/or 31 to 120 workers.
- Service: Small enterprises will be those which employ 16 to 50 and have assets (defined as above) worth BDT 10,00,000 to 2 crore in the service industry and in business.

II. Medium Enterprises

- Manufacturing: In manufacturing, medium industry/ enterprise would be those with assets worth BDT 15 crore to 50 crore (minus land and factory building, and including replacement value) and 121 to 300 workers.

- Service: In the service industry and business, medium enterprises will employ 51 to 120 and have assets (defined as above) worth BDT 2 crore to 30 crores.

III. Micro Enterprise

- Manufacturing: In manufacturing, micro industry/ enterprise would be those with assets worth BDT 10 lakh to 75 lakh (defined as above) and 16 to 30 workers or less.
- In the service industry and business, micro enterprises will be those which employ 15 or less people and have assets (defined as above) worth BDT 10,00,000 or less.

1.2 Availability of ICT Services

1.2.1 Government Initiatives

Bangladesh ranked 147 of 176 on the ICT Development Index 2017 maintained by International Telecommunication Union (ITU), indicating medium to low ICT adoption 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 thrust sector by the government. The Information and Communication Technology Division is a government organisation for the developing and promoting Bangladesh. Several broad ICT initiatives 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://bscicemarket.gov.bd/>) and e-joyeeta (<https://e-joyeeta.com/>).

The following are the few specific Government initiatives to digitise businesses in Bangladesh which promote the business organisations in ICT adoption.

Service	Details
EFD (Electronic Fiscal Device)	NBR introduced the device in 2020. It works in suchs of 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 website provides capacity building training under the feature called Academy ³ . 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, Shamabayadhidaptar, 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 ⁴ is also doing similar things with PaaS.
UBID (Unique Business Identity)	The Government of Bangladesh, with the help of A2i, is implementing UBID or Unique Business ID solutions for business to overcome the identification challenges. Once UBID is there, banks and non-bank financial institutes will recognise these SMEs and provide financial services. Government will later connect UBID with EFD, trade license, BIN, TIN, and other government and financial platforms.

³<https://academy.ekshop.gov.bd/>

⁴<https://bscicemarket.gov.bd/>

Service	Details
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 DeutschePost (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	<p>Other solutions that the government is working on right now are,</p> <ul style="list-style-type: none"> ● Ekpay: A payment solution (https://ekpay.gov.bd) ● Ekshopdelivery: A delivery solution (https://ekshopdelivery.com/) ● BPO Delivery: 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 many of the SME owners are either 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.

1.2.2 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 customised solutions increased. Particularly, some start-ups have emerged in recent years, which are building solutions based on customised specific needs of the businesses.

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	ERP 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	sManager 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.



Methodology

Major part of this study was based on primary 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 study team conducted KIIs and FGDs with the SME entrepreneurs of the selected nine industries in three different sectors 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 researchers also consulted the findings with other niche SME industries to get the overall ICT adoption scenario of SMEs in Bangladesh.

2.1 Literature Review

According to the study of Lightcastle Partners (Lightcastle Analytics Wing, 2021) the growth trajectory of Bangladesh over the past decade has been outstanding with 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 ICT adoption of SMEs depends on the owner's decision. Study findings clearly specified that ICT adoption is directly connected to the scope of the firm. In another study, Karim and Gide (2019) emphasises 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. Arefinand 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 by Hossain and Chowdhury (2022) shows a positive impact from 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) emphasise 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 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 technology introduction. Findings of this study also shows the positive relationship between technology adoption and success for SMEs. The study findings proposed by Rahman and Kabir (2020) indicate that ERP solutions can significantly improve the supply chain management systems for SMEs in Bangladesh, because most small and medium enterprises are suffering from poor communication problems. The study by Haque and Ahlan (2018) concludes that Information and Communication Technology can boost performance of general people and improve the overall human capital for poverty alleviation in a society.

Therefore, it is evident that adoption of ICT in SMEs positively impacts on the growth and profitability of the organisation. 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.

2.2 Data Collection

As mentioned earlier, the following data collection methods are used in this study.

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

Key Informant Interviews: Key Informant Interviews (KIIs) have been 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 include both male and female participation in the KIIs. However, the number of female participations is 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 Jashore, Dhaka, and Chittagong.

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A total of 33 KIIs have been conducted with SME business owners, of which 11 is female entrepreneur and the rest 22 is male SME owners. Nine (8 males and 1 female) KIIs have been arranged with the head of different associations relevant to the SME sectors. Nine Interviews have been 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 have been conducted using the Zoom platform. Arranging FGDs has been started after executing half of the KIIs. Therefore, we have sufficient data at hand that triggers more insightful information from the FGDs. The first FGD focused on the issues of light engineering sectors and 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 Jashore. Since the FGDs were conducted using the Zoom platform, it was difficult to on board more participants in the FGDs due to lack of digital literacy among the SME owners.

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 study team has tried to be uniform in selection of interviewees from all selected sectors, and has been successful to some extent. Some of the interviewees were not willing to disclose their industry in the report.

The study team collected data from several locations in Bangladesh to understand the SME clusters, ICT adoption in those clusters, and derive the implications. Although majority of the interviewees were from Dhaka, several KIIs have been conducted in Jashore, Chittagong, Gazipur and Kishoregonj. Some of the interviewees were not willing to share their address in the report.

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.

2.3 Data Analysis

As the study scope is qualitative in nature, there is a very little scope of quantitative data analysis. Rather most of the effort is 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 are analysed using interview transcripts from entrepreneurs and trade facilitation bodies, synthesising and validating findings from the literature review (academic and industrial reports), Bangladesh government database, industry experts and available public reports, etc.

2.4 Limitations of the Study

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



ICT Adoption in SMEs: Current Scenario and Impacting Factors

3.1 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. Example- AutoCAD. ■ CAM (Computer Aided Manufacture) and CIM (Computer Integrated Manufacture) software used for manufacturing planning/ optimisation, synchronisation 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

- 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

3.1.1 Manufacturing

It was found to have limited or no usage of any type of ICT tools in manufacturing unit of the SMEs. The following information was 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.

3.1.2 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 was 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 SMEs in these industries were found to 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 the sector were found to be 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 were found to have websites, but only a few of them were equipped with standard order management software.

3.1.3 Financial/Accounting Management

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

- Leather goods, designer goods, light engineering, electrical and electronics industries were found to have limited usage of ICT tools in their accounting processes. These industries were lagging behind in ICT adoption as one of their most important segments, finance departments were not using ICT tools.
- Plastics and Furniture industries were found to be adept in accounting software. Companies in the plastics industry were 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.
- ICT adoption in accounting management is also limited for the agro and processed food sector. SMEs in this sector were found to be using Excel or Tally Khata for their accounting tasks.

3.1.4 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 were derived:

- Leather, designer goods, electrical and electronics, and furniture industries were using ICT tools in their marketing and sales activities in a limited manner, for example, through Facebook. They were using traditional methods on a larger scale compared to formal digital marketing methods.
- SMEs in the plastic industry were using digital marketing and sales in their business. Several SMEs in this sector were 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 had an e-commerce platform or dedicated marketing team for increasing sales among business clients.
- SMEs in the agro and processed food sector were found to be using social media and digital marketing for their marketing and sales. However, the usage is limited in this case as well.

3.2 Analysis on Current ICT Adoption in SMEs in Bangladesh

Businesses do not digitise 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 2).

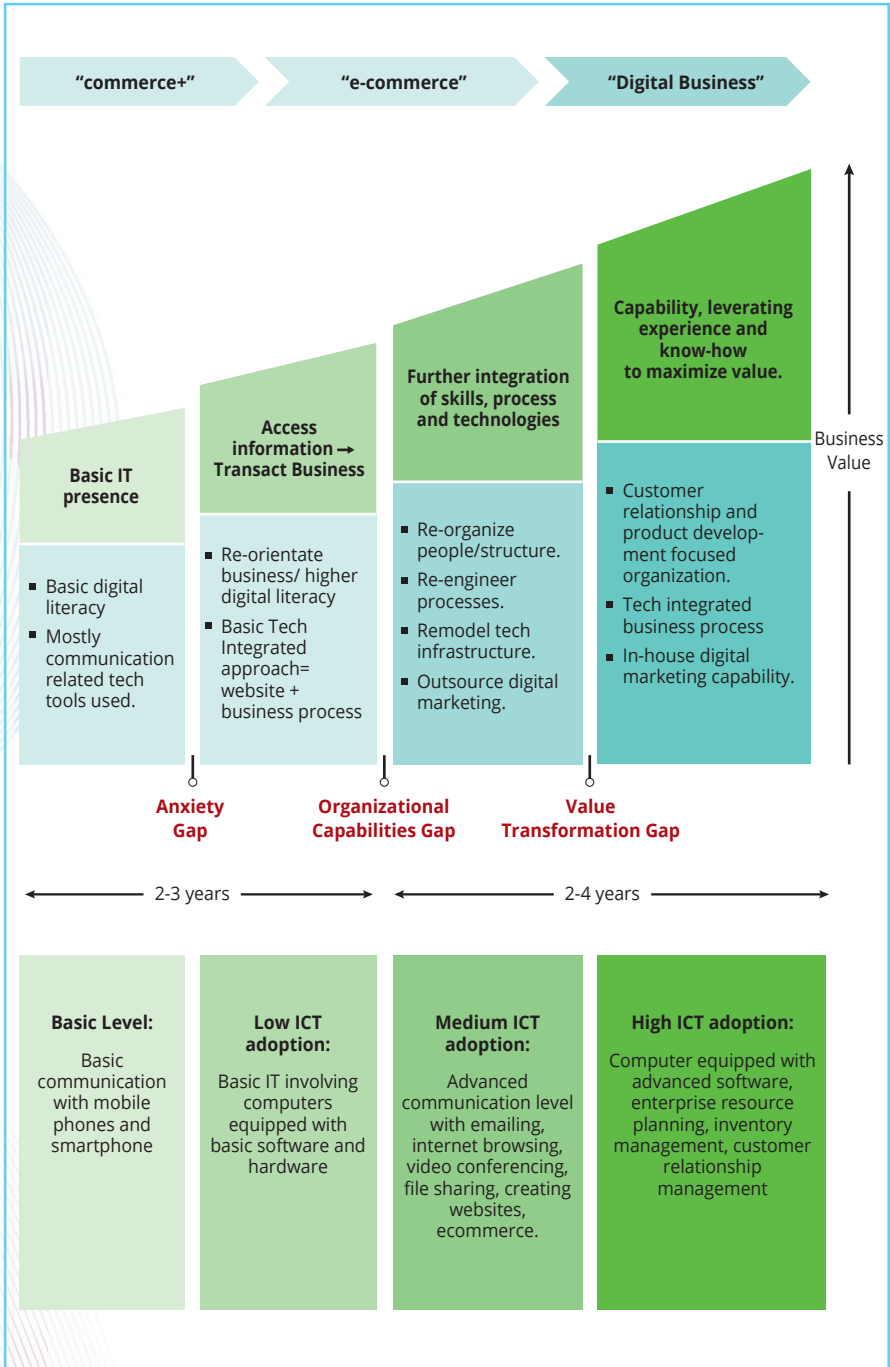
Table 3: Defining Different Levels of ICT Adoption

Levels of ICT Adoption	Colour Code
Basic Level: Basic communication with mobile phones and smartphones. ⁵	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

According to Moving to E-business Framework, initially SME 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 organisational 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.

⁵In "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).

Figure 2: Moving to E-business Framework (Willcocks et al, 2000)



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 SMEs⁶

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

3.2.1 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 3 shows a holistic picture of the SMEs in Bangladesh. At the inflection points towards ICT adoption, Bangladesh has many strengths and weaknesses, and several threats the country's SMEs have

⁶No 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.

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.



Figure 3: SWOT analysis of SMEs in Bangladesh

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.

To explore the SMEs' future prospects, the following table 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 push 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 linkage support from local industries are hampering the growth of this sector.

Sector	Key Reasons to adopt ICT tools	Key Bottlenecks to adopt ICT tools
Electric Goods	<ul style="list-style-type: none"> ● Government push 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.

Sector	Key Reasons to adopt ICT tools	Key Bottlenecks to adopt ICT tools
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. ● Robust competition and demand in the market pushed them to market their services and adopt digital platforms like- social media and websites. 	<ul style="list-style-type: none"> ● Lack of technical capacity/digital divide to adopt ICT tools in management.
Logistics Industry	<ul style="list-style-type: none"> ● High risk asset nature of heavy vehicles, pushed 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 paved 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.

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

A large number of companies had limited use of ICT in accounting management as they were only using Microsoft Excel for all accounting activities. Also, a large number of companies used 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, were also observed to be using vehicle tracking systems and enterprise resource planning software in their business operation.

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

3.2.2 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 was observed in various degrees. They are observed to be 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 are 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 is 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 were observed to have a higher ICT adoption tendency.

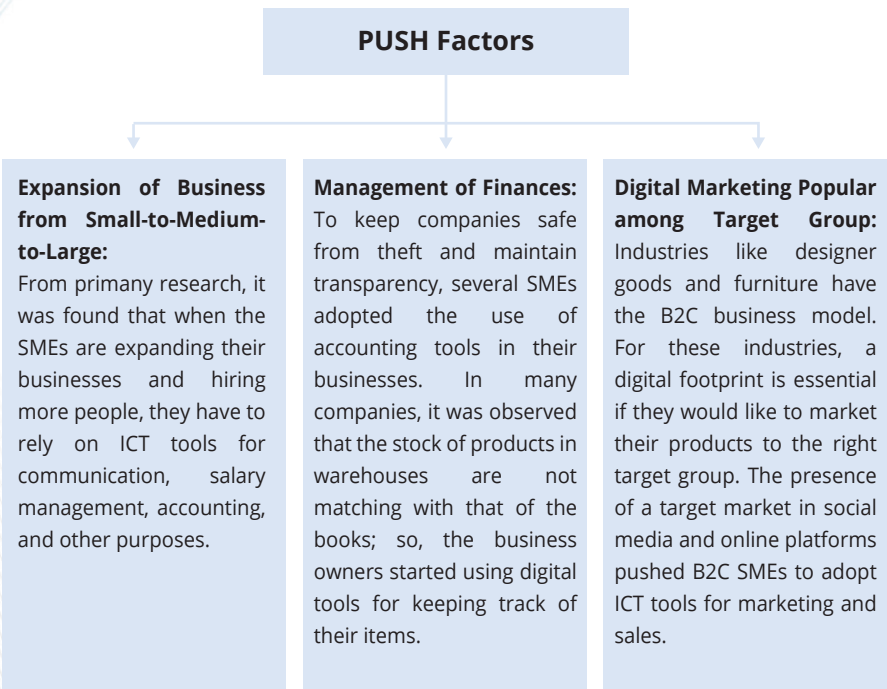
In case of medium and semi-large sized enterprises, the presence of female owners was not observed. Moreover, it was observed that as the size and operational complexity of the enterprises grow so does the nature of ICT tools. And it was observed that complex ICT tools were mostly used by males.

3.3 Driving Factors of ICT Adoption in SMEs

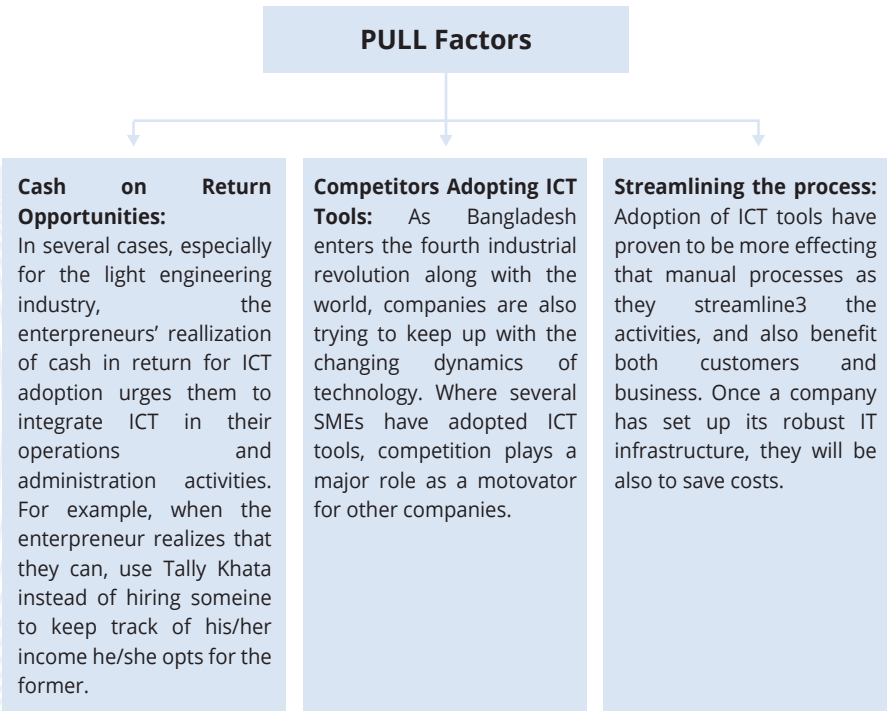
There are several driving factors for SMEs in Bangladesh to adopt ICT in their businesses. ICT tools can provide different benefits across a wide range of inter and intra firm business operations and transactions. Certainly, these applications are able to contribute to improving information and knowledge 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.

3.3.1 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.



3.3.2 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 optimisation or saving cash burn.

3.4 Existing National Policies Impacting ICT Adoption

Government, policy stakeholders, private sectors and development organisations 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 found that a big number of the policies did 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 strategise 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, <i>"Updating the syllabus in line with workplace needs and enhancing collaboration between educational institutions and industries."</i>	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 localised needs of the SME clusters. Moreover, it does not specifically address how to increase the collaboration.
	Section 6.5 of ICT policy states that, <i>"Creating the Necessary Environment to Encourage the Use of Information Technology in Trade"</i> .	In this specific case if one wants to promote the usage of commercial off the shelf (COTS) software in SMEs then the specific action could be diverse. It is 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.

Policy/ Act/Law	Aspects Supporting ICT Adoption in SMEs	Weakness or Gaps in Supporting ICT Adoption in SMEs
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 organisations 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 Income 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 then the issue will be resolved, since the SMEs could claim for tax rebate when such a situation (double taxation) raised. The NBR has already introduced EFD (Electronic Fiscal Device) for organisations, which is a device-centric solution to address the VAT issue for an organisation. 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 organisations 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.



04

Case Studies of ICT Adoption in SMEs: Performance Before and After ICT Adoption

Information and Communication Technology plays a key role in the present business environment of Bangladesh. ICT gives small firms a competitive advantage in the economy and gives them a level playing field in the digital market. Awareness of benefits, top management support, government support and financial support are crucial determinants of the adoption of ICTs in rural SMEs in Bangladesh (Hoque et al, 2016).

In the following subsection, status of enterprises (before and after ICT adoption) are demonstrated using a case study for each of the three different industries.

4.1 Case Study: ICT Adoption in the Plastics Industry



Company Name: N. Mohammad Plastics

Website Link: <https://nmohammadgroup.com/home>

Product Type: Doors, Plastic, and Polymer

Contact: 224/CDA Avenue, Muradpur, Chattogram-4212, Bangladesh

Phone: +88031650362, +8801713032222

Email: mark@nmohammadgroup.com

Case:

The family business, N.Mohammed Plastics company, has been operating in Bangladesh since 1968, and they adopted ICT for scale and transparency in their operations, which evidently lacked in the company before ICT adoption.

The revenue of the company was below BDT 100 crore/year before 2016. Back then, N.Mohammed Plastics used traditional manual methods for book keeping and all other operations.

In 2017, as the company started expanding their business, the management level realised that an ERP (Enterprise Resource Planning) solution had to be adopted for preventing leakage of money and resources, which was prevalent in the company. After researching adequately, the company adopted “Busy”, an Indian ERP solution for running their business. At present, the company uses Wi-Fi enabled premises where everything is kept under surveillance.

The company's efficient and eager workers were easily trained into the ERP systems and helped N. Mohammad Plastics flourish. The company started religiously using the following systems:

- 👑 Computer-based invoicing
- 👑 Automation of majority of activities and tasks
- 👑 Using an ERP solution across the organisation
- 👑 Development of a security system
- 👑 Adoption of an order management, inventory management, and business management software, Busy.

Company AGM, Farman Toyub, mentioned that their yearly revenue at present is BDT 300 to 400 Crore, and productivity of the employees has increased by two-three folds. In 2016, N.Mohammad was a small company with a yearly revenue of below BDT 100 crore. They have managed to increase their revenue 3 to 4 times by streamlining their processes using ICT tools.

4.2 Case Study: ICT adoption in Agro and Processed Food Industry



Company Name: ShashyaPrabartana

Website Link: <https://shashyaprabartana.com/>

Product Type: Food, Soap, Fresh Produce, Oil, and Condiments

Phone: +8801910911002

Email: support@shashyaprabartana.com

Case:

ShashyaPrabartana, started in 2002, is an online and retail outlet for groceries. It supports biodiversity-based ecological agriculture, and it is self-sufficient in supply of the products through its own production, sourcing and marketing of safe and nutritious grocery food products.

ShashyaPrabartana adopted their very own e-commerce system in 2020, and it was possible for them to gain back their regular customers who were shifted earlier. The company also hired their own deliverymen, and were able to reach more people than they had before. The company directly sells their products to the customers and has a B2C model. The stable flow of sales the business has now, majorly comes from website sales.

As online business becomes more popular in Bangladesh, the owner mentioned that their sales of products will be almost twice in 2021 of what they used to be in 2020. Online adoption also helped the company focus on detail, where they ensured that the photos are exactly the same as their original product. Product details are crucial, mentioned the owner. In his opinion, it helped to build trust through online sites. Also, their own motorbike access, fast inventory & supplies etc. helped

them to grab the potential of ICT adoption. The owner additionally said that their company uses inventory management software for ensuring that there is always product available for the customers, which further helped them in ICT adoption.

The owner mentioned that they had faced the following challenges while adoption of ICT and integration of an Ecommerce platform:

- * Website development and maintenance was difficult due to lack of skilled employees. The organisation hired a student from NSU to tackle this problem, who maintained the social media platforms along with the website.
- * Reorganisation of the website was necessary for the company, which was difficult at first as they didn't have any skilled manpower to do the task.
- * The company used to outsource their delivery processes to other delivery companies through websites or apps. As ShashyaPrabartana were not satisfied with their service, they hired their own delivery men and communicated with them through their own platforms or social media platforms.

Sales volume of the company increased during the pandemic through online platforms such as Facebook and Ecommerce. The owner provided interesting information, that online sales were higher during the pandemic than during regular times. When the lockdown was lifted in Bangladesh, ShashyaPrabartana introduced their offline shop at Banani.



4.3 Case Study: ICT adoption in Light Engineering Industry



Company Name: Adiba Metal Industries

Social Media Link:

<https://www.facebook.com/Adiba-Metal-Industries-109551817146182/>

Product Type:

Cooking pan, frying pan, different size metal bowl, kitchen crockery.

Contact: Md. Salim Shaik, New Town, BISIC Estate., Jashore

Phone: +8801727208651

Case:

Adiba Metal Industries started its business in 2007 as a proprietary organisation. At the beginning, it produced only cooking pans and belonged to the micro enterprise category with an employee size of around 25. However, it expanded its business later with diverse products. The organisation does not have any web page. The sales and marketing of the company solely depends on traditional approaches. The usage of ICT-based services is very low. However, it has been maintaining a Facebook page for the last two years.

The organisation was facing a few challenges in its operation, for example, being unable to get a clear picture of the item-wise production and inventory status, theft of raw material and produced goods and so on. Moreover, the owner was unable to get the financial data when it was required to take business decisions.

The owner of the organisation has no institutional education and no ICT knowledge. However, with the support of a local ICT entrepreneur, he took steps to address the challenges he faced. First of all, he set-up close-circuit (CC) surveillance cameras throughout the production premises and other necessary locations. This almost reduces the theft to zero level. He starts to understand the benefit of using ICT in business. Later, he installed accounting and inventory solutions developed by a local ICT entrepreneur, recruited semi-skilled ICT staff and addressed the earlier challenges. Since the adoption of the ICT-based solution, he feels comfortable in managing the business operation and focusing on expansion in production. Currently, the organisation has a total of 67 employees in production and has become a small enterprise. Thus, use of ICT tools helps the organisation in prospective expansion.

It is evident from the above case study that as the company grows, it adopts ICT solutions to have better resource management and optimisation. N. Mohammad Plastics started to use ICT tools heavily when it transforms from medium enterprise to large enterprise. This is a very common phenomenon observed across other SMEs as their operational and financial scope expands. The company also faced challenges from the employees to upgrade the existing working procedures, nonetheless, the management pushed through to have company-wide ICT adoption. During the growth, reluctance from legacy manpower is a very general trend observed across SMEs. Only strong and visionary management can easily overcome this.

Covid-19 pandemic was a shock to most SMEs, but for some SMEs that came as an opportunity to venture into the digital world and adopt digital tools to thrive. Like ShashyaProbartona, the Covid-19 pandemic provided a necessary push for many SMEs to take the first step of ICT adoption. The case of Adiba Metal Industries clearly indicates that it is very much important to quantify the benefits of using ICT in SME's operation.



Global ICT Adoption in SMEs: Factors, Policy Trends and Opportunities

5.1 Factors of ICT Adoption in SMEs

SMEs are regarded as a very important part of the economy in most countries, if not all. The following countries and their activities, regulations, programs, and other facilitating jobs are discussed below as a learning opportunity for Bangladesh.

Driving Factors for ICT Adoption/Inhibition in SMEs across countries

India

There are several studies done in India on IT adoption among Indian SMEs.

One study done in Rajasthan (Pandey & Kushwaha, 2016) reflects there are three major factors in ICT adoption among SMEs.

- Competition,
- Government and
- Customers.

Another study done (Kumar & Ayedee, 2021) after the Covid-19 lockdown tried to understand how technology can solve the challenges faced by SMEs in India during the pandemic. The study found the following factors influencing ICT adoption in SMEs.

- the owner's characteristics,
- perceived usefulness,
- perceived ease of use and
- facilitating conditions.

Nigeria

One study conducted in Nigeria (Apulu, Latham, & Moreton, 2011) reflects that there are 8 major factors inhibiting the ICT adoption in SMEs. They are-

- Lack of electricity supply
- Lack of financial resources
- Lack of government support
- Poor internet services
- Corruption
- Lack of support from banks
- Poor infrastructural facilities
- Lack of skills

Vietnam

According to the report by Chau, Deng, & Tay (2020), the following factors heavily influence the adoption of ICT among Vietnamese SMEs:

- Perceived benefits
- Perceived compatibility
- Perceived financial security
- Organisational readiness
- Organisational innovativeness
- Customer pressures
- Government support



5.2 Trends in Policy to Boost ICT adoption in SMEs

In several countries, the Government introduced many programs, fairs, and implemented regulations for the benefit of the SMEs and their ICT adoption. The following countries can be examples for Bangladesh:

Singapore

Singapore's Infocomm Competency Programme was launched in November 2003 and lasted till March 2005 with a vision of increasing computer literacy of the country's workforce. The amount subsidised by the programme was SGD5.00 (USD3.00) per trainee per hour for SMEs on ICT courses including office applications, workgroup applications, desktop publishing, and webpage design (UNDP, 2005).

Japan

The Government of Japan allows 6% deductions of lease payment on new machines from the annual income tax payments for corporations. This is done to encourage SMEs to adopt ICT equipment in order to increase productivity. The government also subsidises 25% or less lease payments for corporations who are working in aquaculture, lumber supply, and agribusiness management (UNDP, 2005).

Hong Kong

Several sector-specific programmes are arranged by the Hong Kong Productivity Council to help businesses increase their productivity by using ICT resources. Enterprise resource planning center provided consulting, training, and a software platform along with those for its subscribers. Additionally, the Vocational Training Council of Hong Kong offers e-learning courses for specific sectors (UNDP, 2005).

Korea

The Korean marketplace website is a Korean Government made site to allow Korean SMEs display their products to the global buyers. The local Korean SMEs can easily get a global footprint using this site. In 2005, the site hosted more than 20,000 homepages of e-catalogues and SMEs displaying over 120,000 products (UNDP,2005).

Canada

The Government of Canada announced the Canada Digital Adoption Program (CDAP) in budget 2021, to support Canadian small and medium-sized enterprises (SMEs). CDAP is designed to help SMEs digitise their businesses and improve e-commerce presence. The program provides expertise and funding to SMEs, along with that, they provide training and work opportunities for young Canadians (Innovation Canada, 2021).

Central European Countries (CEE) Case to boost ICT adoption among SMEs

A technical report of American University of Armenia (Shakhmuradyan, 2020) discussed that different tax incentives are playing a major role in SMEs ICT adoption and conducting research and development. Central European Countries (CEE) provides a wide range of tax incentives in high technology and equipment, exemption of reinvested profits, tax credits and allowances for acquisition of high technology plant, corporate research and development, employment, representation, and interest expense. These incentives have fostered sustainable growth of their economy in the recent decade. In those countries tax policy is designed such that SMEs have incentive to adapt technologies and hire technical talents.

	CIT Holiday and Exemption	CIT Rate Reduction	Investment Tax Credits and Allowance (Plant and Equipment)	Investment Tax Credits and Allowance (R&D)	Investment Tax Credits and Allowance (other than P&E and R&D), Grants and Subsidies	Accelerated depreciation allowance	Export VAT and Import Tariff Exemption	Special Economic zones
Albania	✓	✓				✓		
Bosnia			✓		✓	✓	✓	
Bulgaria					✓	✓		
Coratia		✓	✓	✓	✓	✓		
Czechia				✓	✓	✓		
Extonia	✓	✓					✓	
Hungary	✓	✓	✓	✓	✓	✓		✓
Latvia	✓	✓			✓			✓
Lithuania		✓	✓	✓	✓		✓	✓
Macedonia	✓	✓					✓	✓
Poland		✓		✓	✓	✓	✓	✓
Romania	✓	✓		✓	✓	✓		
Serbia	✓		✓	✓	✓		✓	
Slovakia		✓	✓	✓	✓	✓		
Slovania			✓	✓	✓	✓		

Figure 4: Tax Incentives for ICT and R&D Investment in CEE countries, February 2020⁷

⁷ Source: PricewaterhouseCoopers, also known as PwC (<https://taxsummaries.pwc.com/>)

5.3 Global Tech Solutions to Boost ICT Adoption in SMEs

There are several tech solutions offered in Kenya, India and ASEAN countries to the SMEs in their country. Few of the tech solutions' details are provided below.

Table 7: Global Tech Solutions for SMEs

Name	Type	Key Features
INDIA		
Shopmatic	ERP Solution/ Full-stack solution	Shopmatic provides a platform for any merchant who wants to take their business online. Right from helping them develop their own webstore to listing them on marketplaces and social channels and providing them with insights on how to sell online.
Khatabook	Accounting Solution	Khatabook (Ledger Account Book) to replace your traditional khata with a new digital ledger cash book. Khatabook automatically takes care of all accounting needs. With the payment reminders feature, an automatic SMS is sent to customers every time a transaction is recorded against them.
Meesho	Social commerce/ e-commerce	Meesho enables small businesses and individuals to start their online stores via social channels such as WhatsApp, Facebook, Instagram, etc. Meesho is an Indian-origin social commerce platform, starting from December 2015. It enables small businesses and individuals to start their online stores via social channels such as WhatsApp, Facebook, Instagram, etc.

Name	Type	Key Features
INDIA		
LendingKart	Credit solution	LendingKart Technologies Private Limited is a fin-tech start-up in the working capital space. The company aims to transform small business lending by making it convenient for SMEs to access credit easily. The company uses technology and analytics tools by analysing thousands of data points from various data sources to assess the creditworthiness of small businesses rapidly and accurately.
Of-Business	Raw material providers	A platform, which helps the country's small and medium businesses (SMEs) in getting raw materials. The business-to-business (B2B) start-up also gives credit of up to ₹2 crore to these small and medium scale entrepreneurs. This is done through its non-banking financial institute platform Oxyzo Financial Services.
Shiprocket	Logistics/ Logistics solution aggregator	Shiprocket is a logistic tech aggregation platform which automates logistic solutions for small businesses in the e-commerce sector. With the help of latest technologies such as data analytics and AI, the start-up helps recommend the best shipping medium and partner to the sellers. The platform integrates with several leading and specialised logistics partners such as Delhivery, Xpressbees, FedEx, Blue Dart, etc. to provide seamless logistics services. It has the largest network reach in India with 26,000 pin codes available for pickups, deliveries, and cash on delivery.

Name	Type	Key Features
Kenya		
SME Connect	Retail. E-commerce	SME Connect provides a platform for SMEs to sell their products, manage orders, manage money, and also receive customer feedback.
M-Pesa Business Till	Payment Service	M-PESA business allows business owners to collect payments on the till and use the collected money to purchase other things directly from the platform.
ASEAN Countries		
Tokopedia (Indonesia)	Retail/ E-commerce	Launched in 2009, Tokopedia operates a marketplace that allows small retailers and big brands to sell to consumers in Indonesia
Banhji (Cambodia)	Fintech	The application provides SMEs with support services in access to market information and support services in financial literacy.
iHub (Singapore, Philippines, Thailand)	web-based integrated platform	iHub provides mentorship, business support services, product development related workshops, access to start-ups, and venture funding through the local and international venture capital community.

ICT adoption among SMEs of different countries did not happen as a development story, rather their SMEs were supported through a complicated system of policies, regulations, enabling digital infrastructure and backup from the local human capital pool. Also, these policy and regulation related recommendations given in the last few decades for those countries are specific to their unique socio-economic and industry related challenges for that particular period of time. So, just mentioning cases of ICT adoption will put the cases out of context and may lead to wrong recommendations for Bangladesh.

Challenges of ICT Adoption in SMEs

Majority of SMEs were found to face similar challenges in ICT adoption. The SMEs mentioned some general barriers to success as well.

6.1 Challenges for SMEs in ICT Adoption

- **Credentials or identification of SMEs:** Most SME businesses lack business identification numbers, particularly the micro and small enterprises lack documents like trade license, BIN number, etc. In several cases, the process of getting those business credentials is not easy. Sometimes they avoid having these licenses intentionally out of fear of tax implications or avoiding VAT/Tax. In some cases, they are reluctant to expose their business. And, hence, avoid using ICT tools in basic business operations.
- **ICT knowledge:** From primary research, it was found that the majority of SME owners did not have adequate knowledge of several ICT tools for accounting, communication, and marketing. For example, several business owners could not use the zoom platforms properly and the majority of them did not know how to use these communication platforms. The SME owners have also expressed that their lack of knowledge on basic ICT tools are limiting their opportunities.
- **Trust in local ICT service providers:** Many SME owners have expressed that the local ICT service providers such as Internet service providers or local software support staff are involved in fraudulent activities and are not reliable. As the businesses are unable to rely on these service providers, they have to miss out on the services as well.

SME owners perceive ICT tools usage and facilitation will be a complicated issue, this is fuelled by lack of trust in local ICT service providers or stories about bad ICT tools adoption experience among other SME owners.

- **High cost of ICT service and tools for Micro and Small Enterprise:** Bangladesh government has set the price of internet services for households and businesses. On one hand, many ICT service providers are not adhering to these set prices, on the other hand the set prices are high for several SMEs in rural areas. The cost of ICT tools provided by the local market is also high compared to their willingness to pay for those tools.

- **Trust in e-commerce platforms:** In recent years, due to business malpractices by some e-commerce platforms there were severe delays in delivering the ordered products. Moreover, due to lack of quality control, in some instances customers got cheated by fake or faulty delivery of products. This has created an issue of shaky trust among the e-commerce businesses and clients.
- **Costly penetration into the global marketplace:** Entering the global marketplace is a great opportunity for SMEs in Bangladesh. Unfortunately, entering the global market will require high freight cost, raw materials cost, quality checks, and maintenance costs, which are higher for the majority of Bangladeshi SMEs.
- **Value propositions by IT tools:** Most SME owners do not understand the value proposition of adopting new ICT tools. It might happen due to lack of education, awareness or they are busy with day to day business complexities and challenges. On the other hand, SME owners/top management's personal characteristics or willingness play a major role in providing push inside the SMEs for ICT adoption.

6.2 Challenges for SMEs in General

Along with the challenges of ICT adoption, the SMEs have voiced some general challenges they face and that creates more barriers to ICT adoption.

- **Scarcity of skilled human resources:** Similar to the owners, the majority of workers in the SMEs are not knowledgeable about ICT tools. So even if the businesses start adopting ICT tools in their operations, it is a challenge for the human resource to learn using these tools.
- **Absence of marketplace focusing on Micro and Small enterprise:** The popular digital marketplaces in Bangladesh such as Daraz and Pickaboo are not catering to the niche segment of micro and small enterprises. As a result, the SMEs are struggling to compete with the large corporations and attracting buyers in the present marketplaces.
- **Price of raw material:** Majority of raw materials for several industries are imported in Bangladesh, and the prices of these raw materials are relatively higher for the SMEs in Bangladesh as freight cost is incurred while importing. This acts as a challenge for SMEs, especially in the light engineering sector.
- **Absence of collaboration between industry and academia:** The education sector of Bangladesh does not necessarily prepare the graduates for industries as there is limited focus on vocational education and training. As a result, when the graduates are entering the market,

both employees and employers are facing a challenge where the newly hired graduates need to be trained again. For SMEs, this is a costly process and creates bottlenecks.

- **Market access challenges:** We have observed that some SMEs cannot access global markets in other countries due to lack of regulation and quality control related understanding of their destination markets. For example, Agro-Processed food SMEs mostly cannot meet the quality assurance requirements and phytochemical related regulation issues of the destination country to export or access these global markets. There is a big awareness and capacity gap among SME owners to access these international markets.



Recommendations and Conclusion

7.1 Strategic Recommendations

From our study we have realised there are three major broader bottlenecks: issues related to VAT/tax policy, access to affordable and inclusive public and private ICT solutions, and lack of capacity in SMEs to adopt ICT tools. We have formulated several strategic recommendations based on these broader issues.

7.1.1 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 management systems.	<ul style="list-style-type: none"> ▪ ICT Division ▪ Ministry of Industries ▪ NBR 	<ul style="list-style-type: none"> - 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

Description: Benefits from ICT investments spill over to 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, etc 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 labour. 	<ul style="list-style-type: none"> - 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, their organisational capacity will increase; on the other hand, 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.



7.1.2 Development of Inclusive ICT Service Ecosystem Strategic Recommendations (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 	<p>-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</p> <p>-SMEs will feel comfortable to use ICT tools in their business operation</p>	All sectors

Description: Digitisation 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. Digitising 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 	<p>- Increase the availability of the required ICT services, which in turn promote business growth</p> <p>- Increase ICT adoption</p>	All sectors: Manufacturing, service, and Agro & Processed Food will be able to get customised software.

Description: Digitisation 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. Digitising the systems will also encourage SMEs to learn the digital methods of completing these processes.

DISESR 03: Customised (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 customised accounting software, business management software, marketing tools, and training modules for employees	<ul style="list-style-type: none"> ▪ Startup organisations ▪ IT/ITES companies ▪ Local digital marketing service providers ▪ Ministry of Industries 	<ul style="list-style-type: none"> - Customised software will help the SMEs in adoption of ICT tools -The employees will be trained easily with customised software 	All sectors: Manufacturing, service, and Agro & Processed Food will be benefited from customised software.

Description: As the customised ICT tools are introduced for different industry SMEs, it is important that the software is affordable, so that small businesses 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"> ▪ Startup organisations ▪ IT/ITES companies ▪ ICT Division ▪ Ministry of Industries ▪ NBR 	<ul style="list-style-type: none"> - 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 benefit 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
<ul style="list-style-type: none"> - 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
<ul style="list-style-type: none"> - Track ICT adoption metrics among SMEs. - Track ICT usage among households. 	<ul style="list-style-type: none"> ▪ SME Foundation Bangladesh ▪ ICT Division ▪ BASIS 	<ul style="list-style-type: none"> - 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 2018-19⁸. In 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. This shall be done regularly and triangulate the findings with the SME ICT adoption survey in near future.



⁸https://a2i.gov.bd/wp-content/uploads/2020/04/Top-Line-Report_Bangladesh-National-ICT-Household-Survey.pdf

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

CDSISR 01: Conduct behavioural 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 behavioural issues.	<ul style="list-style-type: none"> ■ SMEF ■ BSCIC ■ Industry associations ■ A2i/Muktopaath ■ Bilateral and multi-lateral organisations, ■ 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

Description: Before providing capacity development training to SMEs, they require training to tackle some behavioural 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.

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.

CDSISR 02: Development of vocational training centres 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 specialise in different things, and focusing on this aspect will result in effective solutions.	All sectors

Description: Vocational training has always been a practical and fast approach for adoption of anything new. The training centres will improve the knowledge and expertise of SMEs in several locations of Bangladesh, and may even inspire others to open their own businesses.

7.2 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 acted 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 also presents three case studies that clearly show the benefits of ICT adoption in SMEs in Bangladesh.

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. As the study findings suggest that there is a lack of trust between the SMEs and local ICT service providers, the need for certification arises. 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 digitisation of SMEs in Bangladesh.

SMEs are a vital part 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. Now technological tool adoption happens in two stages; first the industries adopt shallow and relatively cheap tech solutions like (IT/ICT tools), then they adopt resource intensive deep technological solutions (AI, cybersecurity, robotics, etc.). Unless Bangladeshi SMEs or industries adopt simple IT/ICT tools, we 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 organisations 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 not only from a human capital or capacity development perspective, but also ensure cheap and scalable digital infrastructure, SME friendly Tax/VAT policies, implementation of regulations, etc. 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.



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A. Contacts of the Interviews-Associations

Industry	Organisation	Name & Contact
Electrical and Electronics	BEMA (Bangladesh Electronics Manufacturing association)	Mosharraf Hossain Bhuiyan, President 01711560533
Light Engineering Industry	Automobile Workshop Owner Association, Bangladesh	Mohammed Shaheen, Joint Secretary General, Bangladesh Automobile Workshop Malik Samity, 8801711184662
	Bangladesh Engineering Industry Owners Association (BEIOA)	Abdur Rajjak, President 01998016710 01819245588, 38 Tipu Sultan Rd, Dhaka 1100
	Engineering Industry Owners Association (EIOA), Jashore	Mohammad Harunur Rashid, Secretary, BEIOA, Jashore
Designer Goods Industry	JDPC/Handicrafts/ Nakshikhata	Banglcraft Ashrafur Rahman, Shovapoti, 01711563332 Fare Diya Complex (3rd Floor), 11/8 / E, Free School Street. Panthapath, Dhaka-1205. Phone: +88-02 9632515
	CWCCI - Chittagong Women Chamber Of Commerce & Industry	Rekha Alam Vice President, CWCCI 01711989429
Leather Goods	Bhairab Leather Manufacturer Association	Mr. Shabuj, Secretary Bhairab Paduka Shomobai Kollan Shomiti 01925835975, Al amin , President Bhairab Leather Cluster 01717709380

B. Contacts of the Interviews-SMEs

Industry Type	Industry	SME type	Organisation	Established Year and Financial Size	Name Contact
Manufacturing	Electronics goods market	Small	Lucky Auto Products	2010	Md. Rafiqul Islam, Owner 01911346196
		Medium	Gupta Infotech Indo-Bangla Industries	2013	Anjuam Ara Begum 5 No.BCC Road near Star Hotel, near Joykali Mandir, Nawabpur 01700743598
	Light Engineering Industry	Small	Honey-Comb Tech	2014	M A Arafin 01712874583
		Small	Shaheen Welding Workshop	1994	M Shaheen 01711 184662
		Small	New Rifat Engineering		Mohammad Harunur Rashid 01733 133685
		Medium	M/S. Adiba Metal Industries	2007	Md. Salim Shaik, +8801727208651
		Medium	Asian Tools	1960s, 4-5 lakh/ per week	Syed Haider Ali, 01711268873
	Designer Goods	Small	Rokomari Boutique	2013	Salma Islam, Circuit House Para, Nurjahan Mansion, Jashore 01791334111
		Small	RokeyaPolli	2008	Shahriar Siddiqi Pollobi, Circuit House Para, Jashore 01713 660978

Annexes

Industry Type	Industry	SME type	Organisation	Established Year and Financial Size	Name Contact
Manufacturing	Designer Goods	Medium	BeshiDeshi	2018	Zeeshan Khurshed, CEO & Managing Director +880 1886-131313
		Small	Arpi Boutiques	2015	Jannatul Ferdous, Owner, Near Chittagong Ghat Area 01676545209,
		Medium	Piyari Handicrafts		Piyari Karim 01817142579
		Medium	Pearl Palace		Atia Nasrin +880 1616-096636
	Plastics	Small	Haks Industries Limited	2000	Nadia Haq 01711529519
		Small	Export House	2017	Nazrul, Manager, Jashore Pachbaria 01755645051
		Medium - Large	N. Mohammad Plastic Industries Limited	1968, Yearly 400-500 Crore BDT	Md. Farman Toyoub
	Furniture	Small	M/S. Aleya Furniture	2010	Aliya Begum, Main Road, Momin Khola, Sylhet 01923974203
		Small	M/S. Asif Brother's & Furniture	2013	Shahin Begum Abdul Kaiyum, 01674003618
		Small	Desh Furniture	2015 Per month few lakhs BDT	Md. Nurul Amin Khandokar, Manager 01978996514, 01820500752

Annexes

Industry Type	Industry	SME type	Organisation	Established Year and Financial Size	Name Contact
Agro-Processed	Agroand Food Processing sector	Small	My organic Bd	2016	Sharif 01874044515 shapebd@gmail.com
		Small	Sea Fish BD	Family Business Since 1938	Rasheda Khan 01790885188
		Medium	Shosho Probortana		Shahid hossain Shameem
		Medium	RSAL Company Limited	2012 down due to Covid	Rekha Alam Chowdhury, 01711989429
Service	Health Care	Medium	Lal Path Diagnostic	In India 1949, BD 2018	Shishir 01885998042
		Medium	Medicare Pharmacy	2016	Rubana Reaz, 01720-220719
Service	Logistics or Transport	Small	Semicolon (IT Firm)	2018	Emanur Rahman
		Small	Siam Motors	1998	Mr Manik, Owner, 01886335852
		Small	Mihir Freight System	2016-17	Mamun
		Medium	Imtex Packaging	2005	Md. Abdus Sattar 01975008677

C. Objectives and Questions

Objectives	Questions
KII ID No.	####
Demographic Info	Name
	Organisations Name
	Position (Senior Executive/Owner/Proprietor)
	Location/Address
	Gender
	Age
	Education
	Industry and Segment (segment info we can fill up later)
	Email id (if available)
	Phone
Digital access	What kind of internet connection do you have? 1. Broadband internet 2. Mobile Internet 3. No internet connection
	Net speed and general review on the net connection.
	How much do you pay for using the internet (mobile or broadband) per month?
Objectives To find out the current status of ICT adoption in the SME sector in Bangladesh; (For different processes of running SME businesses.)	What type of Logistics & Warehouse Management Tools/services do you use? (ICT/non-ICT)
	What is your goal/expectation to use those tools for this business process?
	What is the expense to use/maintain these tools? (ICT/non-ICT)
	If you are using ICT tools, what was the (positive/negative) impact you have?

Objectives	Questions
To explore the driving forces of ICT adoption in the SME sector;	What are the bottlenecks between transition to ICT from non-ICT? Why aren't you adopting ICT for this business process?
To investigate and measure the impacts of ICT adoption on the SME businesses;	What accounting tools/services do you use? (ICT/non-ICT)
To find out available ICT facilities for SMEs in the public-private sector;	What is your goal/expectation to use those tools for this business process?
To analyse the benefits, challenges and barriers to SMEs' ICT adoption;	What is the expense to use/maintain these tools? (ICT/non-ICT)
ICT tools or non-ICT tools/services used? (the question has to be asked for both ICT and non-ICT tools)	If you are using ICT tools, what was the (positive/negative) impact you have?
(Question framework:	What are the bottlenecks between transition to ICT from non-ICT? Why aren't you adopting ICT for this business process?
1. What goals are users trying to achieve and if the app was helping them to achieve that.	What human Resource Management Tools do you use? (ICT/non-ICT)
2. What parts do they love or hate?	What is your goal/expectation to use those tools for this business process?
3. What difficulties do they experience along the way?	What is the expense to use/maintain these tools? (ICT/non-ICT)
4. What workarounds do they use?)	If you are using ICT tools, what was the (positive/negative) impact you have?
	What are the bottlenecks between transition to ICT from non-ICT? Why aren't you adopting ICT for this business process?
	What is your Production/Processing system? What tools/services do you use? (ICT/non-ICT)
	What is your goal/expectation to use those tools for this business process?
	What is the expense to use/maintain these tools? (ICT/non-ICT)

Annexes

Objectives	
	If you are using ICT tools, what was the (positive/negative) impact you have?
	What are the bottlenecks between transition to ICT from non-ICT? Why aren't you adopting ICT for this business process?
	How is Order Management done in your business? (ICT/non-ICT)
	What is your goal/expectation to use those tools for this business process?
	What is the expense to use/maintain these tools? (ICT/non-ICT)
	If you are using ICT tools, what was the (positive/negative) impact you have?
	What are the bottlenecks between transition to ICT from non-ICT? Why aren't you adopting ICT for this business process?
	What online channel do you use for Marketing & Sales?
	What is your goal/expectation to use those tools for this business process?
	What is the expense to use/maintain these tools? (ICT/non-ICT)
	If you are using ICT tools, what was the (positive/negative) impact you have?
	What are the bottlenecks between transition to ICT from non-ICT? Why aren't you adopting ICT for this business process?
ICT tools awareness for Business	Are you aware of ICT tools and its benefits or perils?
To review the legal framework to enable ICT adoption in the SME sector;	Which policies are at present acting as barriers for the adoption of ICT in SMEs?
	What changes need to be taken place in policies for the 9 industries to be successfully adopting ICT in their work?

Annexes

Objectives	Questions
To explore the driving forces of ICT adoption in the SME sector;	Which driving forces are the most important ones for the adoption of ICT in SMEs?
	What type of changes are required for the 9 industries to be successfully adopting ICT in using the driving forces identified?
To investigate and measure the impacts of ICT adoption on the SME businesses;	Which impacts are the positive ones and important ones for the adoption of ICT in SMEs?
	What type of changes are required for the 9 industries for the impact of ICT Adoption to be successful?
To find out available ICT facilities for SMEs in the public-private sector;	Which ICT services/products are used by the SMEs? What do you want to get done with ICT tools?
	What type of changes are required for the 9 industries to make ICT products more available to them, and increase its usage?
To analyse the benefits, challenges and barriers to SMEs' ICT adoption;	Which ICT services/products are most beneficial for the SMEs in Bangladesh?
	What type of changes are required for the 9 industries to ensure maximum benefits from the adoption of ICT infrastructure?
To draw lessons from the global experiences and best practices;	Which country has policies that are suited for the SMEs in Bangladesh?
	What type of changes are required for the 9 industries according to other countries' infrastructure for global expansion?



D. FGD Details

Industry	Organisation
FGD1: Light Engineering - Oct 14, 2021	
Light Engineering	The Metal Pvt. Ltd.
Light Engineering	Mahbub Engineering
Light Engineering	Pubali Engineering
FGD2: Leather Goods - Oct 16, 2021	
Leather Goods	Anex Bangladesh
Leather Goods	T.A.M. Creation
Leather Goods	Design by Rubina
Leather Goods	Photo Leather
Leather Goods	Three Tech
FGD3: Agro& Food - Oct 20, 2021	
Agro& Food	Shaptabarna
Agro& Food	Jamjam
Agro& Food	Ocean Food
Agro& Food	ShosshoProbortona
FGD4: Electric & Designer Goods - Oct 20, 2021	
Electric Products	Mizan Products
Designer Goods	Kazi Fashion
Designer Goods	BD Core
Designer Goods	SutarKabbo

E. Sector-wise Breakdowns of the KIIs and FGDs

Sector	Industry	No. of KII (with owners)	No. of FGD
Manufacturing	Light Engineering	4	4 in total. FGD1: Light Engineering & Electric goods
	Electric Goods	3	
	Plastics	3	
	Designer Goods	6	FGD2: Leather Products
	Furniture Goods	3	
	Leather Goods	1	
Agro & Processed Food	Agro & Processed Food	4	FGD3: Agro& Food
Service	Health Services	3	FGD4: Designer Goods
	Logistics/Transport Services	4	
Others	Jewelry, Hosiery	3	

F. Overview of the Major Sectors

The following major sectors and industries were selected in the current study for measuring the ICT adoption of SMEs in Bangladesh.

Sector	Industries
Manufacturing	<ul style="list-style-type: none"> ■ Leather Goods Industry ■ Light Engineering Industry ■ Plastic Industry ■ Designer goods industry ■ Electrical and Electronics Industry ■ Furniture Industry
Service	<ul style="list-style-type: none"> ■ Health Industry ■ Logistics or Transport
Agro and Food	<ul style="list-style-type: none"> ■ Agro& Food processing Industry

The following section briefly introduces the major SME sectors and their impact in the economy.

Manufacturing

Manufacturing sector is the largest among all the sectors of SMEs present in Bangladesh. At present, 23% of the employees involved in the SMEs in Bangladesh are working in the manufacturing sector (Hossain, 2021). There are several industries in the Manufacturing sector, some of them are briefly introduced below.

Leather Goods Industry

8th

Largest producer of Footwear in the world in 2019



Bangladesh Mainly Exports: Blue Wet Leather, Crushed Leather, Finished Leather, Leather Garments, Footwear

760.2 Million_{USD}
of leather goods exported in FY 2020-2021



The leather industry in Bangladesh mainly comprises footwear and finished leather products. Leather footwear was the main contributing category to the high export revenue, and the sector had a global value of 461.72 million USD in July 2020 to April 2021. The export of leather goods stood at 760.2 million USD from July, 2020 to April, 2021, which is an increase by 8.56% from the same period in the previous year (World Footwear, 2021). Bangladesh was the 8th largest producer of footwear (407 Million pair) in the world in 2019, but was the 18th largest exporter (79 Million pair) in the same year. Revenue generated from finished leather goods exports was 96.10 million USD in the first ten months of FY 2020-2021; the value increased by 6.22% from the previous year.

Light Engineering Industry

Domestic Market Size

**3.1
Billion
USD**

- GDP Contribution of the Light Engineering industry is 2.2% in Bangladesh

- 40% of the local demand fulfilled by Bangladeshi industries and 60% by imported products

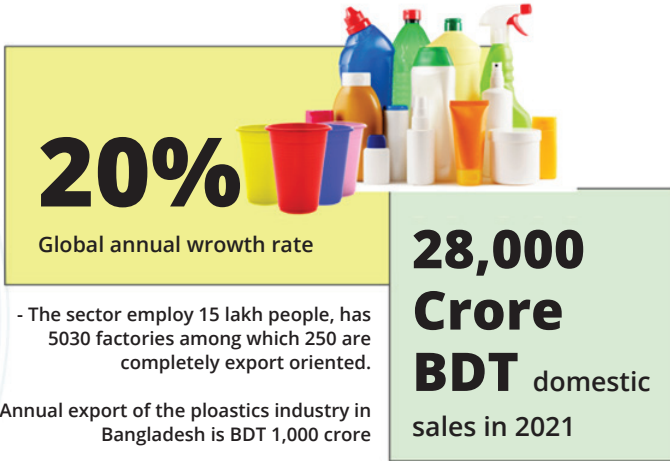


6 Million People working in the industry
with **40-45 thousand**
Small and Medium Enterprises in the industry

Light engineering industry in Bangladesh has a decent market size of 3.1 Billion USD, where around 40,000 to 45,000 SMEs are working actively. The sector is providing employment to 6 million people in the country, along with having a 2.2% GDP contribution.

According to the Bangladesh Chamber of Industry (BCI), domestic demand for light engineering products (LEPs) in Bangladesh is met by local industries and through import, where local industries contribute 40% and import contributes the other 60%. In the domestic production, 7.5% is substituting the imported products, which are known as import substitution. In the inauguration program of Dhaka Trade Fair in 2020, the Prime Minister of Bangladesh, Sheikh Hasina announced LEPs as the “product of the year”. The sector is gradually becoming more popular in the country. Production of LEPs started from Dholaikhal and Jinjira areas of Dhaka, but the enterprises have expanded to several parts of Bangladesh and are now in continuous production in Chittagong, Narayanganj, Bogra, Gazipur, Jashore and Kishoreganj (Islam, Nasiruddin, & Ahamed, 2021).

Plastic Industry



Bangladeshi entrepreneurs and SME owners are very hopeful and ambitious about this sector. Entrepreneurs in the plastic industry are looking to raise their share in the global plastic market from 0.5% in 2021 to 3% by the year 2030. The global plastic market is ever growing and evolving, which is valued at 570 billion USD in 2021, and is growing at an average annual rate of 20%.

In 2021, investment in the Bangladesh plastic industry is a whopping BDT 20,550 crore, where the annual sales in the local market amounts to BDT 28,000 crore. The sector employs 15 lakh people, has 5030 factories among which 250 are completely export oriented. China is the global leader in the plastic industry with 26.8% global share and earns about 24.1 billion USD. The second global leader in the plastic sector is Germany holding 12% share of the global market (Noyon & Ahmed, 2021).

Designer Goods Industry



The apparel sector is divided into seven types of products: Ultra luxury, exclusive luxury, premium luxury, affordable luxury, upper-mass market, lower-mass market, and value/discount retail.

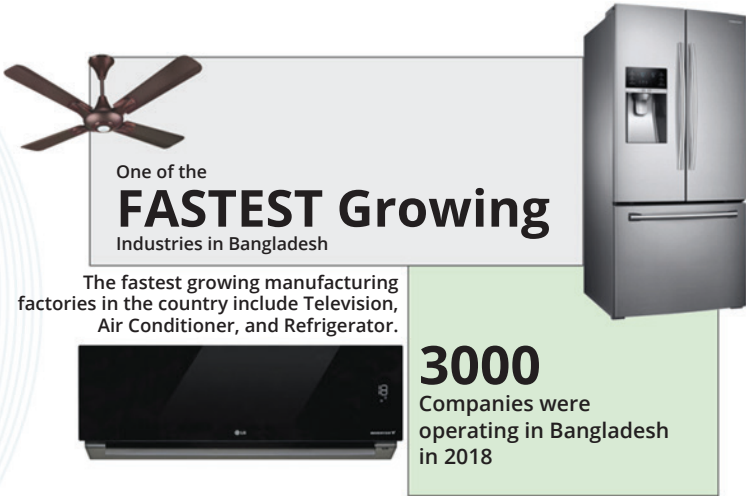
20,000 crore BDT produced
on average every year by Bangladesh designers, These products are
exported globally as well.

The apparel sector is divided into seven types of products: Ultra luxury, exclusive luxury, premium luxury, affordable luxury, upper-mass market, lower-mass market, and value/discount retail. High end fashion comprises the first three categories, but the Bangladeshi fashion industry is stuck with the bottom three categories.

According to the Bangladesh Garment Manufacturers and Exporters Association (BGMEA), the share of high-priced apparel in Bangladesh is very low, 20% (the share is calculated based on price/kg). In the Fiscal Year 2018-2019, 14% to 15% of exported apparel were within the price range of 15 to 20 USD per kg and only 6% qualified for prices over 35 USD.

Bangladeshi companies manufacture upper-middle range jackets, denim, suits, sweaters, and other items. Brands such as Burberry, Marks and Spencer, Tommy Hilfiger are still sourcing their products from Bangladesh, but the horizon for the country's apparel industry is not expanding. Several SMEs are producing sustainable designer goods in Bangladesh, but they are also unable to reach the global market. The local fashion designers are producing products worth around BDT 20,000 crore a year (Kamal, 2020).

Electrical and Electronics Industry



Even a few years ago, Bangladesh was completely dependent on foreign imports for electrical and electronics goods. The export of electrical and electronic (E&E) products has begun in the country on a very small scale, but it is expected to expand rapidly. The sector is actually one of the most rapidly growing sectors in the country. In 2018, approximately 3000 E&E enterprises were operating in Bangladesh, where all types of industries and related businesses are also included. The sector employs over a million people at present, and has been growing at a rate of 15% per year.

The Industrial Policy 2016 included the E&E sector as a sub sector of Energy Savings. In the energy savings sector, there are a number of other industries, such as tube light and LED. The industry was evidently subjugated by imported products in the recent past, but the situation has changed. Transition to local value addition started through the introduction of assembling plants by giants like Walton, Rangs, and Butterfly. Now, other local companies have also started their own assembling plants and are assembling electronic goods locally; some are even producing electronic goods components locally while importing a very few technical components (Begum and Zami, 2021).

Furniture Industry

Domestic Market Size in 2019

**67
BILLION
BDT**

- The urban areas such as Dhaka and Chittagong are mainly dominated by the large corporations such as Hatil, OTOBI and Regal.

- Unbranded manufacturers capture 65% of the domestic market, and the rest 25% is dominated by giant brands

2.5 MILLION People
working in the Industry in 2019, and
Annual turnover of the industry is over
BDT **10.000 crore**



The furniture industry in Bangladesh has represented commendable growth in the last decade where the export of locally manufactured goods experienced a growth of 25%. The sector is the second largest sector of employment at present, which employed 2.5 million workers in 2019. Domestic furniture market in Bangladesh was valued at BDT 67 Billion in the same year, and is showing an upward trend. There are several SMEs involved in the sector where approximately 80,000 units are associated with manufacturing and forward-backward linkages. The urban areas such as Dhaka and Chittagong are mainly dominated by the large corporations such as Hatil, Otobi, and Regal (DATABD.CO, 2019). Annual turnover of the industry is over BDT 10,000 crore, where 80,000 entrepreneurs are doing business. Unbranded manufacturers capture 65% of the domestic market, and the remaining 35% is dominated by giant brands. Bangladesh imported furniture goods worth BDT 665 crore in the FY 2019-2020, where both giant brands and local manufacturers contributed. Major portion of the raw materials (60%) that go into manufacturing furniture in Bangladesh, are imported (Noyon, 2020).

Health Industry

The Health sector in Bangladesh experienced rapid growth in the past few years. The country is the only least developed country meeting nearly 98% of its domestic demand for pharmaceutical products. The government of Bangladesh encourages international companies to partner with domestic companies in producing drugs and high-tech and specialized products. The regulations have been eased by the government, which allows foreign companies to export medical equipment and products to Bangladesh. Entering the Health sector in Bangladesh requires a company to provide essential applications along with supporting documents. For pharmaceutical companies, the applications go through the Directorate General of Drug Administration, DGDA. The Ministry of Health and Family Welfare (MOHFW) formulates all national-level policies for Health.

National level policies, plans, and decisions are implemented by several authorities and Health delivery systems across Bangladesh, from national to community level. The ministry also has indirect control over the Health system of the NGOs and private sector. Majority of medical institutions are in Dhaka city, which acts as the hub for medical services across Bangladesh. Leading subsectors in the Health industry are: medical devices, waste management, clinical lab trials, and sanitation coverage (International Trade Administration, 2021).



Logistics

Bangladesh has ranked **15th** as the worlds' leading emerging markets for logistics in 2019



Chittagong and Mongla ports are the dominant seaports in Bangladesh playing a significant role in handling the cargo movement of the country, where Chittagong port manages 90% of them

74,529 trucks were registered during 2011-May, 2021

The logistics sector of Bangladesh has experienced a recent boom in the economy. There are currently several companies offering different types of logistical services in the country. As the country's annual export and import trade volume reaches 100 billion USD in 2019, the logistics sector has several opportunities to become innovative.

According to the Agility Emerging Markets Logistics Index (AEMLI), Bangladesh has jumped 8 spots and ranked 15 as the worlds' leading emerging markets for logistics in 2019. The logistics market of Bangladesh is divided according to their functions: Freight Transport, Freight Forwarding, Warehousing, and Value-added Services and Other services. The market is also divided according to the end user: Manufacturing and Automotive, Oil and Gas, Mining, and Quarrying, Agriculture, Fishing, and Forestry, Construction, Distributive Trade, Healthcare and Pharmaceutical, and Others (Mordor Intelligence, 2021). The companies are providing freight transport through road, sea, and air, and rail freight has not been introduced in Bangladesh yet. As road congestion increases in the country, freight transport through shipping and inland water transport is gaining more market share. Chittagong and Mongla ports are the dominant seaports in Bangladesh playing a significant role in handling the cargo movement of the country, where Chittagong port manages 90% of them.

Bangladesh stood 100th in World Bank's Logistics Performance Index (LPI) in 2018; the rank of the country was 82nd in 2016. Dhaka has evolved as a central warehousing hub for the majority of logistics purposes from 2017 to 2021,

where Chittagong acts as the gateway for international trading. Chittagong accounts for 90% of the import-export cargo and has become an important center for export-import based warehousing. Dhaka and Chittagong are jointly occupying 70% of the warehousing space in Bangladesh. Khulna, Bogra, Barisal, Rangpur, and Comilla are becoming emerging storage destinations for the domestic consumption market. Major players in the Bangladeshi logistics industry are Bollore logistics, DHL international GmbH, Agility, 3i logistics group, and A.H Khan & Co. (Mordor Intelligence, 2021).

Agro and Processed Food



The agro and processed food industry in Bangladesh is one of the promising business sectors. Market size of this industry is 2.5 billion USD, and the sector contributed approximately 8% to the country's manufacturing output. The Agro and Processed Food industry accounted for 1.7% of GDP in the year 2019. Currently, the sector employs around 1.3 million people, giving jobs to 2.2% of the total workforce in Bangladesh. The majority of its workers (70%) are unskilled labor, and thus there is an assumption of low adoption of ICT in the sector (BAPA, 2021).

In 2019, Bangladesh exports about 400 million USD (Mahmood, 2019) agro-processed food products. Both food and beverages are consumed locally and exported in this sector. Some of the popular products are spices, fruit drinks, fruit juice, pickles, potato chips, processed nuts, potato flakes, and biscuits. Organisations like Bangladesh Agro-Processing Association (BAPA) are the main trade support institutions for the processed food industry in Bangladesh.

