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DIGITALIZATION OF SME IN BANGLADESH

INDICATIONS FOR PLANNING & IMPLEMENTATION

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Supervisor: Professor Wolfgang Gerstlberger

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Contents

Abstract

Every business is bound to have a digital implementation in its business procedures as the world is moving towards being online on the internet. The accumulation and usage of digital information have been helping people to understand the different ways of improving the economy and minimizing different risks along the way. The digitalization of SMEs can have a significant impact on the growth of the economy in a country like Bangladesh. As the major part of the business industry is dependent on the profits generated by the SME sector, the process of digitalization of SME is chosen to be the subject of this paper. At first, the definitions of SMEs in Bangladesh are discussed briefly in the research paper. This research study is conducted to find out 2 major objectives, the digitalization compatibility of SMEs in Bangladesh, and the factors that can actively contribute to the digitalization process of SMEs in Bangladesh. The research process is conducted by a descriptive e-mail questionnaire survey distributed to 300 SMEs located in the two major divisions in Bangladesh, Dhaka and Chattogram. To discuss and analyze these two factors, the process of business digitalization has been discussed in the latter part. Then, the research design is formulated by generating the research framework and building up some hypotheses which have been tested through the research process. The hypotheses are then followed by the methodology of the research. After this, the results of the research paper are generated according to the studies. The results are also measured independently to find out their accuracy to the study. Finally, a small discussion about the findings of the research has been made which includes the compatibility discussion of digitalization and its various factors in SMEs according to the results. The conclusion is drawn after this discussion.

Keywords: *Digitalization, Compatibility, Small and Medium Enterprise, Questionnaire, Bangladesh*

Introduction

Information and communication technology have been a great tool for the advancement of world economics over the last few decades. The accumulation and usage of digital information have been helping people to understand the different ways of improving the economy and minimizing different risks along the way. The digital information can be used correctly due to the proper use of Information Technology (Attaran, 2011). Nowadays, every business organization has access to the digital information they need to gain a competitive advantage over other companies in the industry. The IT sector of the organization plays a vital part in this procedure. But, the different implementations of digital technology are constantly changing and as a result, the business organizations must also keep up with the changes in order to sustain competitive advantage (Keen, 2011). Every business is bound to have a digital implementation in its business procedures as the world is moving towards being online on the internet. Different platforms like social media and e-commerce sites are gradually becoming the backbone of the business industry (Brancheau, and Buckland, 2016). The modern information technology gave birth to the Internet which has now become the most crucial element of the digital world. By using the internet, the world has become smaller and communication become faster than ever before. Moreover, the internet has made different business operations more cost-effective and time efficient. Small and Medium Enterprises or SMEs has the highest advantage in this case. The SMEs which are using information technology compared to the SMEs which are not using information technology definitely have a vast competitive advantage in this 21st century. The internet is such a platform by using which the major drawbacks of establishing a business can be tackled. Analyzing the niche market for a specific product or service and the ways to enter the market can be identified thoroughly by using the information available on the internet. And as there is not much cost associated in the process, so the SMEs gain the most advantage in this case (Aghaei, and Sokhanvar, 2019).

The SMEs are the most significant part of a nation's economy. The SMEs can be run through low capital investment which can help a lot fight unemployment problem. In Bangladesh, the unemployment problem is a major issue and SMEs can surely help to make a significant impact on this. Also, the SMEs comprise a significant portion in the manufacturing and non-manufacturing sector. But, in other countries compared to Bangladesh, SMEs do not have many opportunities to the global market because of the lack of digitalization in the business process. Also, they are lagging behind due to the lack of enough technology and lack of market information. As a result, they are not able to produce products or services which can satisfy customer needs (Ahmed, 2011).

In a country like Bangladesh, SMEs comprise a major part in the nation's economy. Here, almost 99% of all industrial units are SMEs including micro-enterprises. SMEs contribution in Bangladesh GDP was 20.25 percent in 2018 and 23 percent in 2020. (Abdin J., 2018)

The SME sector of Bangladesh is the major part of the business sector in Bangladesh. The growth of the SME sector plays a major part in the economic development of Bangladesh. So, the digitalization of the SME sector's surely a great opportunity for Bangladesh to improve its economy to the next level. Going digital and tapping into the global economy is the next big step for the SMEs in Bangladesh. Because if the SMEs are able to go into the global economy, they will be able to generate more revenue in a better efficient manner as it will save their time and money than doing traditional business. But, at the same time, the SMEs must also improve their business model, adopt new techniques, develop a successful online networking system and improve online security (McConnell, 2010).

The limited access to the global market and involvement in the network economy are major barriers for the SMEs in Bangladesh to go digital. In most of the cases, the lack of skilled workforce and financial resources become the very reason for many SMEs to stay at their

traditional business and not venture the opportunities of digital business. As the digital economy is taking over the world day by day, it is a matter of concern for Bangladesh to improve the SMEs to become digital and keep the national economy stable (Rahman A., Rahman M., and Ključnikov, 2016).

The top management of organizations like SMEs is the major decision-makers of whether or not to implement digital technology in their business. So, if they can understand the current state of the benefits that can be achieved through the process of digitalization and also know about the barriers to the process, then it will definitely be easy for them to make a valid decision that will help both them and their organization (Abdin, 2018).

Briefly if we summarize the research problems from the above discussion, it will be

1. One fourth of national economy is relying on SME sector in Bangladesh. Unfortunately, still it is relying on traditional business model and remaining undigitalized. As a result, we are lagging behind to become a part of global economy like china, Alibaba, Amazon and loosing multi-billion of revenue from global market.
2. Owners of SME's have lack of awareness, how to take the magical advantage of digitalization and global market.

In the study to find out the compatibility of digitalization and the factors regarding digitalization process, there is always a chance of facing ambiguities and uncertainties. Most of these types of researches are not able to find out the perfect empirical analysis and stable foundation that can guide the businesses to success but these studies able to provide enough data to understand the different barriers in the respective process and can help to understand the relationship of various factors of the process. Most of the researches that find out the compatibility or readiness of digitalization only provide a limited amount of information about how to maximize the opportunities of digitalization in the global economy (McConnell, 2010).

Every business is bound to have a digital implementation in its business procedures as the world is moving towards being online on the internet. The accumulation and usage of digital information have been helping people to understand the different ways of improving the economy and minimizing different risks along the way. The digitalization of SMEs can have a significant impact on the growth of the economy in a country like Bangladesh. As the major part of the business, the industry is dependent on the profits generated by the SME sector, the process of digitalization of SME is chosen to be the subject of this paper. At first, the definitions of SMEs in Bangladesh will be discussed briefly in the research paper.

In this research, the factors which contribute to the Digitalization of SMEs in Bangladesh is studied. The following two questions will be answered in this paper:

1. What is the compatibility level of digitalization of SMEs in Bangladesh?
2. What are the factors that are closely related to the digitalization process of SMEs in Bangladesh?

In this research, the different factors that analyze the compatibility of digitalization of SMEs in Bangladesh will be studied and a model will be found for the SMEs to understand the networked economy and become successful in the digital business.

The research process will be conducted by a descriptive e-mail questionnaire survey distributed to the various SMEs located in the two major divisions in Bangladesh, Dhaka and Chattogram due to physical distance issues in Covid-19 globally. To discuss and analyze these two factors, the process of business digitalization has been discussed in the later part. Then, the research design will be formulated by generating the research framework and building up some hypotheses which have been tested through the research process. The hypotheses will be then followed by the methodology of the research. After this, the results of the research paper are to be generated according to the studies. The results are also measured independently to find out

their accuracy to the study. Finally, a small discussion about the findings of the research will be made which includes the compatibility discussion of digitalization and its various factors in SMEs according to the results.

1 Literature Review

Digitalization of business is nowadays a common practice in the global marketplace. According to Engler (2012), the smaller businesses which make effective and efficient uses of the Internet in order to become more innovative and to respond to customer demands faster, have a far greater competitive advantage than the larger firms that do the same. This is because the smaller firms or businesses have less cost in the activities of the business and thus become more efficient in cost management. They can hunt down a lot of opportunities in this fashion if all the processes of digitalization are conducted perfectly. SMEs represent these smaller businesses perfectly. According to Fink (2015), as the SMEs have fewer employees, so it is easy for them to maximize the effectiveness of their employees compared to the larger firms and they can gain a lot of profit from the global digital economy if they have enough knowledge about it. Cisco Systems, Dell Computer and General Electric generated a return of 250% on invested capital and over USD 650,000 per employee in revenue when they changed their traditional business system into the digitalized business. It easily represents how much a business can earn through the digitalization process. McConnell (2010) argued that the capability and capacity to participate in global business and digital economy can be termed as the compatibility of digitalization. Keen (2011) also discussed that when it comes to the matter of new investment, the overall skill of the workforce does matter.

Akkeren, Jeanette, Angèle (2011) discussed that the factors which have an impact upon the IT adoption in a business, are similar to the factors of implementing digitalization in small and medium businesses like SMEs. For this reason, some of the factors from successful IT adoption from the research of Fink (2015) will be used in this research as independent variables. The factors will be internal employee expertise, availability of infrastructure, top management commitment and organizational culture.

Bangladesh's National Industrial Policy Order (2010) explained that the small and medium enterprises, the micro-enterprises, cottage enterprises and women entrepreneurs are included in the SME policy of Bangladesh according to the policy of Bangladesh Bank.

According to Hartman, Sifonis and Kador (2010), the measure of net compatibility for digitalization can be measured by how much the respective businesses are prepared to take advantage of the various opportunities in the global digital economy. The present scenario of the Bangladeshi SMEs shows that most of them lagging behind in terms of technology adaptation. As a result, they are less productive and cannot generate much profit to survive in the present market. Also, another thing which is absent in Bangladeshi SMEs is that they do not have enough access to the global market also, and they are disconnected from the global value chain. For this reason, they do not get any information about the current supply chain model and about the global market demand. Also, in order to be digitalized and at the time to be specialized in it, they need to employ a skilled workforce who are educated and knowledgeable in this sector. An SME which has ICT skilled employees makes 13% more revenue than the one which has regular employee when digitalized. According to Rahman A., Rahman M., and Ključnikov (2016), the government of Bangladesh is trying to use the opportunity of digitalizing the SMEs as this will create a great evolution in the economy of Bangladesh and fulfil the dream of Digital Bangladesh by 2021.

Thong and Yap (2013) discussed that the top management should build up innovation plans for making the use of internet more effective, use different strategic tools to use the technology as a positive element, ensure the effective application of internet technology among the employees, analyze the performance of the whole organization regularly to ensure the effectiveness of the total process.

1.1 Defining SMEs In Bangladesh

Table 1: Defining SMEs in Bangladesh

Type of Enterprise	Manufacturing		Service or Business	
	Assets	No of Employees	Assets	No of Employees
Small Enterprise	Tk 5 to 100 million	25 to 99	Tk 500,000 to 10 million	10 to 25
Medium Enterprise	Tk 100 to 300 million	100 to 250	Tk 10 to 150 million	50 to 100
Micro-Enterprise	Tk 500,00 to 5 million	10 to 24	Tk 500,000 or less	10 or less
Cottage Enterprise	Tk 500,00 to 5 million	10 to 24	Tk 500,000 or less	10 or less

Source: (Abdin, J., 2018)

According to Bangladesh Bank, along with the small and medium enterprises, the micro-enterprises, cottage enterprises and women entrepreneurs are included in the SME policy of Bangladesh (National Industrial Policy Order, 2010).

The manufacturing small enterprises are those which has assets worth Tk 5 to 100 million and/or 25 to 99 workers. But in service and in the business industry, the small enterprises are those which have assets worth Tk 500,000 to 10 million and employs 10 to 25 workers.

In the manufacturing sector, the enterprises which have assets worth Tk 100 to 300 million and/or 100 to 250 workers are medium enterprises. In the service industry and in the business sector, the assets should be worth TK 10 to 150 million and employ 50 to 100 people.

In service and business sector, the enterprises which have assets worth Tk 500,000 or less and employ 10 or fewer people can be defined as micro-enterprises. And in the manufacturing sector, the assets should be worth Tk 500,000 to 5 million and should have 10 to 24 workers.

The manufacturing cottage enterprises should have assets worth Tk 500,000 to 5 million and should have 10 to 24 workers or less. In case of service and business sector, the assets should be worth Tk 500,000 or less and should employ 10 or fewer people (Abdin, J.,2018).

If a woman is the proprietor of a proprietary business or the owner of at least 51 percent of a partnership or a private company registered under joint stock companies, then she would be considered a woman entrepreneur.

The circular said cottage and micro industries would from now on be included in Bangladesh Bank's SME loan policies and programs.

1.2 Process of Business Digitalization and Its Factors

The capability and capacity to participate in global business and the digital economy can be termed as the compatibility of digitalization (McConnell, 2010). A similar definition is provided by APEC which is the degree to which an economy is prepared to participate in the digital economy (APEC, 2010). Although these definitions provide the descriptive details of the readiness of digitalization, they can easily give an understanding that digitalization is the digital way of participating in the global economy (Kotler, 2013).

The measure of net readiness for digitalization can be measured by how much the respective businesses are prepared to take advantage of the various opportunities in the global digital economy (Hartman, Sifonis and Kador, 2010). When any business is ready to invest activities

in e-commerce and e-business and strategize plans accordingly, then that particular business is ready for digitalization (Grant, 2013).

But a business cannot become much successful in e-commerce or e-business if they are not aware of the needs and wants of the customers. The customers, suppliers and also the trading partners must also be prepared for any digital changes for making the business successful and generate profit. They must be fully aware and knowledgeable about the uses of internet and online transactions (Barua, Whinston and Yin, 2010a; 2010b). When the whole part of the value chain is ready for any digital changes to be brought upon, only then the maximum potential of digitalization can be achieved and the respective businesses can earn the maximum profit.

In order to get the maximum outcome from e-commerce and e-business, the businesses can build up specialized apps that can perform different activities to provide various facilities to the customers. For example, in an e-commerce app, the facilities can be like order registration, electronic advertisement, electronic marketing, online billing system and many more. A similar type of facilities can also be provided in an e-business app (Brancheau, and Buckland, 2016).

In the following sections, the different factors of business digitalization will be discussed briefly.

1.2.1 Technology and Infrastructure

The network and technological infrastructure of the world is mainly comprised of the internet. Internet is the sole network that bounds all communication system in the digital world. So, in order to build up a digital infrastructure, any respective business organization must have a

decent understanding of the uses of the internet and the different opportunities that can be achieved through it. The more there is understanding about the internet, the more the business can build up its network infrastructure of e-commerce and e-business to tap into the global economy (McConnell, 2010).

The major six (06) components of the digital business compatibility are:

1. E-government leadership
2. Regulatory, trust, and financial infrastructure
3. Knowledge and process-based economy
4. Content infrastructure including content management process
5. Human infrastructure including skill distribution network
6. Communication and information systems infrastructure and access

The access to the modern technologies and the proper use of them is crucial for any business to go digital in the first place. The major infrastructure of any digital business is centered purely on its networking system and its elements. The elements are respective computer hardware, application software which assists in the process of networking. The infrastructure of information technology can be used as a major business source that can help to attain a competitive advantage in the industry (Keen, 2011).

The most common barrier that any SMEs in Bangladesh face is the lack of access to the information infrastructure to go digital. The SMEs do not have enough access to tap into the global economy for this very reason. This lack of access to infrastructure is defined as a fundamental barrier for most of the SMEs (APEC, 2010). Their study shows that the larger firms do not face much difficulty to go digital and build up information infrastructure as they

can invest more whereas the small businesses like SMEs cannot always provide enough investment to build up a better information infrastructure and as a result, they have limited access to the global economy (Hasan, 2019).

So, in order to identify the compatibility of digitalization of the SMEs in Bangladesh, it is important to analyze the infrastructure and technology as a crucial element.

1.2.2 Human Resources

A business revolves around its major workforce. Without the workforce, a particular business cannot perform almost any tasks. For this very reason, the employees of the workforce are also seen as a capital resource of the business. And this particular capital resource is also subject to new investments. So, when it comes to the point of achieving competitive advantage, the skills of the workforce do matter (Keen, 2011). In the digitalization process of SMEs, the employees who work in the technology sector act as the major workforce element. As the proper understanding and usage of the Internet are important in the digitalization process, the IT personnel must have sound knowledge about it. Moreover, the skills buildup of the rest of the employees is also important after digitalization because almost all of the business activities will be revolved around technology and networking. So, the business organization must invest time and money to improve the skills of its employees continue to build up a skilful and ethical workforce (Bakos, 2012).

The organization where the employees have more digital or IT experience are more likely to become successful in adopting digital technology (Fink, 2015). Workforce development through skill improvement has a positive impact on the digital adoption in an organization (Doukidis, Smithson and Lybereas, 2013).

1.2.3 The concern of Information Security

Any business organization in the digital world is exposed to the threat of information theft. The quick advancement in technology always makes new ways to overcome security barriers and steal vital information about the business. So, the business organizations must continuously focus on their security and update it for keeping the information safe from being stolen. In a country like Bangladesh, continuously improving the information security is not always possible due to the lack of skills the employees possess in the technological area and for this reason, they almost always rely on the pre-build software to protect the information. The information infrastructure of the SMEs is vulnerable at the same level compared to the bigger businesses, but bigger businesses have more resources compared to the SMEs for information protection. So, the cost of upgrading the information security acts as the major barrier in this case (Thong, and Yap, 2015).

As Angu Selvan, the Head of Internet Technology, Nokia Internet Communication quoted that the internet has always been for availability and not much for security. So, keeping things secure from the internet is much harder than finding out new information from it. This problem of information security is the most major obstacle in the way to becoming a digitalized business in this 21st century. The internet from where the hackers can access personal financial information being sent electronically, the consumer confidence to use it after knowing this is a serious drawback of digitalization (Goodwin 2011). For this reason, people tend to stay more careful when they transmit any type of financial information over the internet (Gupta 2015). In another research, it is also shown that when the customers know who they are dealing with over the internet and know a physical location of the business, they have more confidence in the financial transaction as they believe they have more control over the situation (Janes,

Lambert, Pollett and Reid, 2017). In Bangladesh, except the people who work in the ICT sector, do not know much about how to protect their information digitally. As a result, they have significantly less confidence in e-commerce and e-business. E-commerce as a great medium to conduct business digitally, the people are not being confident in this due to the information security concern (Tan and Teo, 2014).

The decision-makers in any business organization make the difference to adopt digitalization or not. In a sinus study, it has been found out that, security, privacy and property protection are the three major factors for the implementation of digital technology in any business. According to the research on SMEs in Australia, the issue of information security is termed as the single major obstacle towards digitalization. For these reasons, the information security concern should be a major factor in the digitalization process of SMEs in Bangladesh (Islam, and Karim Miajee, 2018).

1.3 Organizational Factors

1.3.1 Resistance to Organizational Change

The resistance to any organizational change is one of the most common things in any business organization. This resistance to change is studied from the basics of individual and organizational behaviour. According to both management and workers' resistance to organizational change is one of the main barriers of industrial progress (McNurry, 2013). This happens as the traditional management system views the organizational change as an adversary.

So, if there is any technological change like implementing digitalization in business, especially the small business will face some significant challenges like making up new schedules and

gathering up information. But, on the other hand, the internet can also play a significant role to overcome these types of challenges the small businesses face (Jutla, Bodorik, and Dhaliwal, 2012). The place or region where the digitalization of business will take place, a strong e-commerce network must be established to overcome the resistance and fear of organizational changes (McConnell, 2010).

The cultural differences among various regions is another challenge to overcome the resistance to change (Waddell, and Sohal, 2011). So, when the digitalization of business will take place it will also be important to understand the cultural differences of the customers, as well as the employees who work within the business. An uninterrupted mode of networking and communication through the internet can significantly help in this scenario (Attaran, 2011).

1.3.2 Top Management Commitment to Change

Any business organization is not fulfilled to its full potential without a good and balanced top management. So, if there is an organizational change that will lead the business towards digitalization, then the commitment of the top management on ensuring the perfect implication of the change should be heard and felt throughout the whole business organization. The managers in the top management should always keep in touch with the employees who are working in the technology division of the business so that there are no mistakes along the process. This will help top management to ensure that an integrated decision has been taken for the betterment of the organization (Fink, 2015).

The change in the business organization is always a tough process as the whole activities of the business organization depends on it. For this reason, the top management must always stay committed to any structural organizational change. The adoption of digital technology in the

business process of SME will bring upon new challenges for the business which the top management should face smartly and thoughtfully so that the change can bring positive outcomes for the business. If the digitalization process is a success, and the SMEs have adopted digital technology successfully, then this will open up new approaches and opportunities in the nation's economy (Thong et. al. 2016).

The top management can stay committed to the digitalization process of SMEs by performing different activities. For example, continuous monitoring of the employees in the technology sector, assessing the performance individually, assessing various risks, analyzing competitors, analyzing market factors etc. The most important part of the digitalization process in any business is conducted by the executive committee and the technology division. So, the top management should keep particularly keep more focus on these two divisions (Kleindl, 2010).

2 Methodology

In this research, the target population consists of SMEs located in the two major economic divisions in Bangladesh, Dhaka and Chattogram. The respondents of this study are expected to have an appropriate understanding of the digital technologies which can be implemented in the business operations and also have decent knowledge about the process of digital transaction and information sharing. The number of sample subject in this study is targeted at around 300. The respondents completed a two-page questionnaire for this research. The questionnaire was prepared by building up several key research hypotheses by the guidance from experts in this respective field. The definitions of different variables and studies from various previous researches were used to make and build up the questionnaire. The questionnaire was delivered and the data collected through it was mostly done through e-mails and other digital ways of communications. Most of the respondents of this study are either the decision-makers of the respective business organization or they are the IT personnel of the business. The respondents were expected to be knowledgeable about their own SMEs as the SMEs have less than 150 employees. So, the expose of organizational changes and the implementation of digital technology in these SMEs is also expected to be accurately identified through the answers provided by the respondents. To fulfil the purpose of this research qualitative and quantitative methods were chosen.

The research took place over the course of six months in country, from March 2020 to October 2020, sending dozens of formal and informal emails, facebook and other forms of communication tools to reach companies and building a rapport understanding and communication with the business owners, senior and mid-level executives, officers and employees in the SME sector.

In February, 2020 I identified companies to use in my sample; All through my research and communication tenure we maintained a warm and comfortable communication methods. They were free to respond or decline any questions answers in the questionnaires, which they were uncomfortable with.

2.1 Results

Among the 300 questionnaires which were provided among the different SMEs, 75 of them provided with accurate responses. So, there is a response rate of 25%. It can be said that this response rate is considerably high as this was totally a mail survey. The normal response rate of any mail survey is 10-20% on average in Bangladesh. The main reason for the lower response is because the persons who complete these surveys are actually the decision-makers of the business and they have less time accompanied to response to mail surveys and in most of the time they are working hard to run their business operations smoothly and efficiently. So, a higher response rate would make a more accurate representation of the study in this case.

Table 2: Respondents Profile

Variables	Category	Respondents	
		Number	Percentage
Position	Senior Management	21	28
	Middle Management	30	40
	First Line Technology	24	32
Job Function	Information Technology	21	28
	Finance/Accounting	5	6.67
	Human Resources	4	5.33
	Sales/Marketing	7	9.33
	Customer Service	8	10.67
	Administration/Owner	12	16
	Operation	15	20
	Others	3	4

Source: Worked out by the researcher

Table 3: Organization Profile

Variables	Category	Respondents	
		Number	Percentage
Division	Dhaka	41	54.67
	Chattogram	34	45.33
Organization Type	Manufacturing	37	49.33
	Non-manufacturing	38	51.67
Number of Employees	1-50	39	52
	51-100	14	18.67
	101-150	22	29.33
Organization Size	Small	43	57.33
	Medium	32	42.67
Average profit level (profit over sales)	1% or less	5	6.67
	2% - 5%	13	17.33
	6% - 10%	25	33.33
	11% - 15%	11	14.67
	Above 15%	21	28
Annual growth (sales rate)	1% or less	9	12
	2% - 5%	27	36
	6% - 10%	21	28
	11% - 15%	14	18.67
	Above 15%	4	5.33

Source: Worked out by the researcher

In this study, the wave analysis method with Student's t-test is used to compare between the data of early and late replies of the respondents as this is the next best approach when the direct comparison of the responding and non-responding firms is not possible. This approach is also viable because the late respondents are similar to the non-respondents. They also suggested using the t-test procedure using the assumptions of both unequal and equal group variances. In this study, no between-group mean differences at the 5% level for any of the variables were found. For this reason, it can be said that there was no sign of non-response bias in this research.

3 Research Design

3.1 Research Framework

The research framework that has been used in this study is illustrated in Figure 01. The digitalization of SMEs is a dependent variable which relies on the Four (04) independent variables- infrastructure and technology, human capital, information security and organizational factors. The organization factors are also divided into two subfactors, which are resistant to change and top management commitment (Fink, 2015).

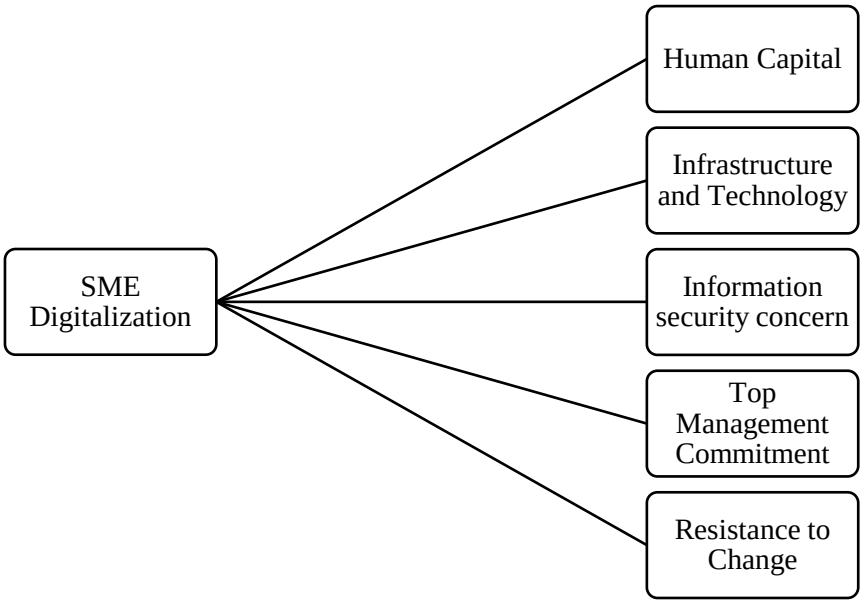

Figure 1: Research Framework, Source: (Fink, 2015)

3.2 Hypotheses

In the digital world, to be involved with the networked economy, it is important for SMEs to use infrastructure and technology as a basic tool. Among four different firms in the IT industry, the one that has a higher level of information technology were more likely to adopt and use the internet (Mehrtens, Cragg and Miles, 2011). For this reason, it can be easily said that, in order to introduce digitalization to the SMEs, the infrastructure and technology has a positive relationship (Simu, and Chowdhury, 2019).

H_1: Infrastructure and technology will be positively related to the digitalization of SMEs

In any business organization, people are one of the main assets. In order to start the digitalization process in SMEs, the people within the organizations must have an understanding of how different techniques work and how to use them. The main elements in this scenario are the internet, e-commerce and e-business. If sufficient organizational resources like sufficient developer and sufficient technical skills are available within the organization then the implementation of a successful information system can be done. So, in this case, it can be stated that the digitalization process of SMEs is positively related to the human capital of an organization which is its internal staff's expertise and skills (Kwon, and Zmud, 2017).

H_2: Human capital is positively related to the digitalization of SMEs

In the 21st century, information security is one of the main concerns behind doing things easily. as information can be easily collected through the internet and other digital processes, maintaining the security of this information is a tough job. Also, different information like online money transactions and other confidential information face the most risk in the security concern. The information security council is one of the main barriers behind E-Commerce and e-business. Business organizations have to install different hardware or software to enforce the

security measures of the information. This fear of losing security to the information is negatively related to the digitalization process of SMEs (Parasuraman, 2012).

H_3: Information security concerns will be negatively related to the digitalization of SMEs

Changing from the traditional business system into a digitalized system will bring upon a lot of internal and external changes in the business structure of SMEs. Most of the SMEs in Bangladesh rely on the participation of the employees and maintaining the highest productivity of those employees is one of the most crucial tasks of the top management. So, changes can make the regular activities of the employees a bit more challenging as new opportunities arise from those changes. The resistance to technological changes can limit the benefits and opportunities of the changes (Sandkull, 2010). The SMEs which have a CEO who has a positive attitude towards IT will most likely to adopt IT on the organizational level (Brancheau and Buckland,2016). So, resistance to change can definitely have a negative relationship in the digitalization process of SMEs (Jahur, and Quadir, 2012).

H_4: Resistance to change will be negatively related to the digitalization of SMEs

The commitment of the top management is always important not only for the digitalization process of SMEs but also it is important for any major or minor organizational changes in every business organization. Without the support and resource of the top management, no SMEs can adopt digital technology within the organization (Dandridge and Levenburg, 2010). Good support from the top management of the organization helps to adopt digital technology more easily and efficiently (Ives and Olson, 2014)

H_5: Top management commitment will be positively related to the digitalization of SMEs

4 Accuracy of Measures

4.1 Digitalization Measurements

The 21-item scale measuring the e-readiness of the SMEs (dependent variable) was submitted to a principal components' analysis with varimax rotation. All the items have the value of Measures of Sampling Adequacy (MSA) more than 0.5. Besides, Kaiser-Meyer-Olkin Measure of Sampling Adequacy is 0.86 and Bartlett's Test of Sphericity is significant with value 0.00.

Based on the rotated component matrix, out of the 21 items, ten items (question 2, 3, 4, 5, 7, 9, 10, 11, 12 and 21) were dropped as they have high cross-loadings. Four factors met the selection criteria of eigenvalues greater than 1.0, explaining a total of 73.91% of the variance. All the items selected had factor loadings greater than 0.50. However, factor 3 has been dropped because it had only one item (question 19). Thus, we have retained only three factors with 10 items for the digitalization compatibility measurement with a total variance explained of 66.29%. (see Table 4)

Table 4: Results of the Factor Analysis

Digitalization Compatibility	Factors			
	1	2	3	4
Digital Technology Readiness				
Ready to use digital technology for managing production planning	**0.81**			
Ready to use digital technology for inventory management	**0.85**			
Ready to use digital technology for group collaboration	**0.84**			
Ready to use digital technology for scheduling	**0.87**			
Ready to use digital technology for outsourcing activities	**0.79**			
E-commerce readiness				
Ready to receive purchases from customers through the Internet		**0.61**		
Ready for online selling to customers via the Internet		**0.75**		
Ready to offer customer services via the Internet		**0.79**		
E-business readiness				
Customers are ready to engage in electronic interactions				**0.63**
Suppliers are ready to engage in electronic interactions				**0.87**
My customers are ready to engage in electronic transactions			***0.63***	
(e.g. making payment electronically)				
Eigenvalue	10.57	2.12	1.58	1.08
Percentage of Variance	50.85	10.32	7.62	5.12

Note: The item in italics was dropped because of a single item

Source: Worked out by the researcher

4.2 Effectiveness of The Measures

Table 5 presents the reliability or effectiveness coefficients for the main variables of the study.

Table 5: Effectiveness of the Measures

Variable	Number of Questions	Cronbach's Alpha
Digital Technology Readiness	6	0.91
E-commerce readiness	4	0.83
E-business readiness	3	0.63
Infrastructure and Technology	8	0.89
Human Capital	3	0.91
Information Security Concern	5	0.81
Resistance to Change	7	0.87
Top Management Commitment	5	0.93

Source: Worked out by the researcher

The reliability analysis, assessed with Cronbach's Alpha reliability test, was carried out in order to ensure the internal stability and consistency of the items used in each variable. The values ranged from 0.63 to 0.91 and considered to be reliable.

The descriptive statistics of the composite variable are shown in Table 6.

Table 6: Descriptive Statistics of the Composite Variables

Variable	Mean	Standard Deviation
Overall E-Readiness	3.39	0.69
Digital Technology Readiness	3.25	0.95
E-commerce readiness	3.26	0.85
E-business readiness	3.72	0.83
Infrastructure and Technology	3.11	1.01
Human Capital	3.23	1.09
Information Security Concern	3.12	0.71
Resistance to Change	3.61	0.79
Top Management Commitment	3.57	0.85

Source: Worked out by the researcher

4.3 Pearson Correlation Analyses

In table 7, the dependent variables (with 3 factors) and the independent variables show some degree of correlation between them. But, as the correlation value is not above 0.75, therefore there are no chances of multicollinearity when the regression analysis is run. If the correlation value were above 0.75, then there would be a chance of having multicollinearity in the results. (Saha-et-al-2020)

Table 7: Intercorrelation of the Study Variables

Variable	1	2	3	4	5	6	7	8
1. Digital Technology Readiness	1.00							
2. E-commerce readiness	0.53**	1.00						
3. E-business readiness	0.19*	0.26*	1.00					
4. Infrastructure and Technology	0.52**	0.58**	0.23*	1.00				
5. Human Capital	0.18*	0.38**	0.21*	0.48**	1.00			
6. Information Security Concern	-0.11	-0.22*	-0.18*	-0.29*	-0.43**	1.00		
7. Resistance to Change	-0.27*	-0.33**	-0.23*	-0.33**	-0.61**	0.47**	1.00	
8. Top Management Commitment	0.59**	0.61**	0.24*	0.59**	0.41**	-0.19*	-0.38**	1.00

Note: **p<0.01; *p<0.05 **Source: Worked out by the researcher**

4.4 Testing the Hypotheses

The result of the regression analysis is shown in table 9. Infrastructure and technology (β= 0.202, p< 0.05) and top management commitment (β= 0.467, p< 0.01) were found to be positively related to digital technology readiness. As for e-commerce readiness it was the same case as infrastructure and technology (β= 0.113, p< 0.05) and top management commitment (β= 0.543, p< 0.01). For the digital technology readiness and e-commerce readiness, top management commitment was the most influential driver indicating the role of top management in gearing the company towards network readiness. For e-business readiness, top management commitment did not seem to contribute whereas infrastructure and technology (β= 0.305, p< 0.05) was the only significant driver. This goes to show that for e-business readiness the infrastructure and technology availability was the significant predictor.

Thus, H1 of this study is fully supported whereas H5 is partially supported.

Table 8: Multiple Regression Analyses Results

Independent Variables	Standardized Beta		
	Digital Technology Readiness	**E-commerce Readiness**	**E-business Readiness**
Infrastructure and technology	**0.202***	**0.113***	**0.305***
Human Capital	0.115	-0.085	-0.053
Information Security Concern	-0.195	-0.049	-0.084
Resistance to Change	-0.012	-0.019	0.015
Top Management Commitment	**0.467****	**0.543****	0.049
R square	0.415	0.411	0.095
Adjusted R square	0.367	0.365	0.081
F value	9.548**	9.487**	2.29*

Note: **p<0.01; *p<0.05 **Source: Worked out by the researcher**

5 Discussion and Conclusion

The digitalization of the SME sector in Bangladesh is quite challenging but the rewards for making it happen are even greater. Maximizing the digitalization of the business functions of SMEs in Bangladesh can eradicate unemployment problem for good and at the same time, it can minimize poverty at a great scale. The most important things which are important for the digitalization of SMEs in Bangladesh are the commitment of the top management of the respective SMEs and constructing the internal business infrastructure to be technology friendly. But there is always a chance of improvement and further studies can redefine this research results to get an even better understanding of the topic.

Based on the overall e-readiness, the responding firms generally are not very sure about their readiness in adopting e-commerce, e-business and Internet. An overall e-readiness mean of 3.39 explains this situation. Zooming into the components of compatibility of digitalization, from Table 7 the mean of 3.25 and 3.26 suggests that in general SMEs in Bangladesh have mixed feelings about their readiness in digital technology and e-commerce respectively. Nonetheless, from the mean of 3.72 indicates that SMEs in Bangladesh have higher readiness in terms of e-business readiness.

The regression analysis results show that infrastructure and technology, and top management commitment variables have a significant impact on SMEs' compatibility. Human capital, information security, and resistance to change do not demonstrate any significant effect on the compatibility of SMEs.

5.1 Digital Technology Compatibility

Management support has been found to positively and directly influence digital technology readiness of SMEs. The involvement of management was positively associated with the success of IS implementation and computer technology acceptance (Yap, Soh and Raman, 2012). Management support has been defined as the perceived level of general support offered by top management in SMEs. The more involvement and support demonstrated by top management, the higher the digital technology compatibility (Cragg and King, 2013).

5.2 E-Commerce Compatibility

The finding from this study indicates that the result of digital technology is the same as e-commerce readiness. Infrastructure and technology positively influence the e-commerce readiness of SMEs. This again is consistent with the previous studies based on the same reasons as given for the digital technology readiness. System integration enables firms to react, innovate, and make continuous improvements by identifying and sharing information across products, services, and the business unit which enhance the organizational knowledge and readiness in adopting e-commerce (Barua, et. Al., 2010a; 2010b). Thus, the more up to date and the higher the availability of infrastructure and technology, the more ready the company is to adopt e-commerce. Besides this, top management commitment also positively influences e-commerce compatibility of SMEs thus we can conclude that the higher the involvement and support demonstrated by top management, the higher will be the e-commerce compatibility.

5.3 E-Business Compatibility

According to the result of this research, the SMEs have a significantly higher score in the E-business compatibility. Thus, compatibility for doing E-business is mainly dependent on the availability of enough technology and IT infrastructure. So, the firms which are continuously working to improve their infrastructure, are shown to be more compatible with doing e-business. The higher levels of IT usage lead to an increased chance of adopting digital technology (Mehrtens, Craig and Mills, 2011).

5.4 Hypotheses Not Feasible (Context of Human Capital)

According to this study, the human capital was not found to be influencing the digitalization of SMEs in Bangladesh. The internal technical support is mainly available in business organizations like SMEs for basic training purposes (DeLone, 2014). The effectiveness of external support is necessary more than internal support in the digitalization process. The variety of engagements and support work done by external vendors and consultants may have given them the exposure and experience which have not been available to many internal support groups to offer (Thong and Yap 2013). Human capital was also not influenced because of the lack of financial resources. There has been no priority for SMEs to set up internal IT support group, instead, they largely rely on external expertise and resources when computerizing.

The result of the study shows that confidence of SMEs in the information security does not have a significant effect on the digitalization SMEs in Bangladesh. Once the information security feature is installed, the confidence level of the information security technology would not play an important role in e-readiness. The level of relative concern with security appeared

to decrease as firms become more advanced and gain a better understanding of security issues and the appropriate technologies to address them such as encryption (APEC, 2010).

SMEs aim to adopt e-commerce, e-business and Internet technology so that it will bring significant change to their performance. Over 62 percent of managers agreed that organizational and cultural factors form the greatest barrier in achieving 27 significant return upon their data-to-knowledge related investment (Davenport et al., 2011). However, the rejection of the hypothesis that resistance to change negatively influences the compatibility of digitalization of SMEs, is not consistent with general studies done before. In the SMEs business environment since the owner or manager is the best person who understands the critical success factors and payoffs of investment, he or she plays an important role in ensuring success in digitalization. Therefore, once the owner makes the decision to embark towards the e-economy, the employees' resistance to change is no more an issue.

5.5 Implications of the Research

This research finds out several general implications which can help in the process of digitalization of SMEs in Bangladesh. The most common problem in acquiring digital technology is that smaller businesses do not trust the digital way of business over their traditional business process. And even some of the smaller businesses want to implement digital technology, they cannot do so because of the shortage of financial resources and lack of expertise within the business. The limited accessibility to newer technologies is another reason for not being able to upgrade the business to be a digital one from a traditional one.

Even in the presence of all these barriers, the SMEs in Bangladesh must proceed towards digitalization, because the economy of Bangladesh is majorly influenced by them. Also, the SMEs which are really trying their best are ready to go digital and build up their business to

become even more successful. But they are also faced with another barrier of limited infrastructure and application of technology. For this reason, building up the IT infrastructure and increasing the technological application in business activities can help the SMEs to become more compatible to implement digitalization in their respective business.

The process of building up IT infrastructure and increasing the uses of technology within the business can be fueled by the commitment of the top management within the business. If the top management can allocate a perfect budget and build up a planned schedule for this, then the respective SMEs can accelerate their business process by making their IT infrastructure even stronger (Davenport et al., 2011).

According to the findings of this research, it is also seen that the participation of the top management along with the commitment of making the works done by the employees is another crucial factor of digitalization. The change of business organization is never easy, and the employees should get guidance from the top management so that they can work their part effectively in the process. The top management should build up innovation plans for making the use of internet more effective, use different strategic tools to use the technology as a positive element, ensure the effective application of internet technology among the employees, analyze the performance of the whole organization regularly to ensure the effectiveness of the total process (Thong and Yap 2013).

So, among all the factors that have been studied in this research, the infrastructure and technology came out to be the most significant one when it comes to the process of digitalization of SMEs. As the infrastructure and technology is the most important factor, so

the SMEs should definitely focus on building up the networked economy and give their time more in the process of e-commerce and e-business.

5.6 Limitations of the Research

As there are different unknown factors and this study has been done with a limited number of samples the results can vary to small extents. The factors like the past experience of the workers and managers, different organizational changes, varying characteristics of different organizations. This study is solely focused on the major industrial areas of Bangladesh. But future studies should also focus on the rural areas as well as the urban areas. Also, the different factors which can change over time should also be focused as the results can change.

5.7 Suggestions for Future Studies

For a better digitalization plan of SMEs in Bangladesh, it is recommended to continuously focus on the opportunities that arise due to the advancement of digital technology. The compatibilities of different technologies to work on business activities should be studied continuously in order to get a more precise and efficient plan for digitalization. The dynamic factors like manager's and worker's past experiences, organizational characteristics, organizational changes must be analyzed and used correctly on the research. And as the world is moving towards customer experience-based businesses it is also required to understand the customers even better than before. Understanding the correct customers and their preferences would be a great start for different SMEs who are trying to digitalize their business.

Conclusion

This research findings shows that the compatibility of SME digitalization Bangladesh is very positive and ready to enter in e-business. By a questionnaire approach data was collected and analyzed using qualitative methods and quantitative as well where necessary, and revealed interesting results related to why and how SMEs take part in digital transformation in order to implement digital technologies. Different theories given by numerous scholars and researchers on transformation of organization created an understanding of the context, content and process of the digitalization of SME in Bangladesh and gave support for getting answer the research questions of the study. The results of the study showed that:

The key factors for digitalization of SME's are mainly to be found in its own necessity, as an independently the biggest sector of employment, contribution in national GDP, generating profits and economic growth of the country, competing and surviving in the global market. There are however internal factors that contribute to digitalization initiatives, such as business owners' or employees' own interest in implementing digital technologies.

SMEs will pursue four major opportunities by dint of digitalization: improved operational efficiency, improved customer relationships, and improved products and manufacturing and revenue. The SME's digitalization related to pursuing these opportunities can generally be described as strategic as the underlying purpose of the digitalization is to attain a competitive advantage in the local and international market, but digitalization also drive to transform in business model and processes as well as changes related to people (e.g. training and hiring of new employees). (Tish Sanghera:2020)

The digitalization process involved in digital transformation that have already occurred globally with tremendous success (e.g. they implement and use digital technologies in similar ways to others in their sector). The change process of digitalization is not necessarily transformational (radical) in its degree, even though it can involve large-scale changes.

The main challenges come in digitalization are related to business owners, employees, as lack of knowledge and skills of employees are perceived to impede the change process. Resistance to change among employees, owners and partners, lack of finance and cyber-security are other challenges that SMEs digitalization struggle in Bangladesh. Encountered challenges could partly be explained by SME characteristics, such as scarce resources, which need to be considered when analyzing digitalization strategies of SMEs. At the end, as a part of managerial recommendations based on the overall studies and findings for SME digitalization and holistic economic growth Bangladesh needs to consider and make sure government and owner of the enterprises mutual cooperation and working together, developing cyber security act and its proper implementation.

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Appendices

Appendix 1. SME Organization Digital Compatibility Questionnaire

Please rate your opinion on the scale of 1 to 5. A higher rating means better.

	1	2	3	4	5
My organization is ready to use digital technology for managing production planning	◯	◯	◯	◯	◯
My organization is ready to use digital technology for inventory management	◯	◯	◯	◯	◯
My organization is ready to use digital technology for group collaboration	◯	◯	◯	◯	◯
My organization is ready to use digital technology for scheduling	◯	◯	◯	◯	◯
My organization is ready to use digital technology for outsourcing activities	◯	◯	◯	◯	◯
My organization is ready to receive purchases from customers through the internet	◯	◯	◯	◯	◯
My organization is ready for online selling to customers via the internet	◯	◯	◯	◯	◯
My organization is ready to offer customer services via the internet	◯	◯	◯	◯	◯
My customers are ready to engage in electronic interactions	◯	◯	◯	◯	◯
My suppliers are ready to engage in electronic interactions	◯	◯	◯	◯	◯

Appendix 2. SME Digitalization Factors Analyzation

Please share your feedback on the following survey.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I believe infrastructure and technology is an important element for digitalization	◯	◯	◯	◯	◯
I believe human capital is an important element for digitalization	◯	◯	◯	◯	◯
I believe information security concern has an impact on the digitalization of business	◯	◯	◯	◯	◯
I believe the commitment of the top management of an organization has an impact on digitalization	◯	◯	◯	◯	◯
I believe the resistance to change can have an impact on the digitalization of business	◯	◯	◯	◯	◯

Source: Worked out by the researcher (Based on Literature Review)

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