Feasibility Study of Web-Based POS System Implementation for SMEs in Bangladesh

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Abstract. As a developing country, Bangladesh is still less advanced in using the latest technologies such as websites, e-commerce, high-speed internet, point of sales (POS), etc. which is a great barrier in SME development. Proper implementation of technologies can achieve the full potential of this valuable sector. This paper aims to find out the feasibility factors of the implementation of a web-based point of sales system for SMEs in Bangladesh. The implementation of such kinds of systems will help SME entrepreneurs to achieve more potential from their businesses. A comparison of ICT developments, technologies, and POS system adaptation scenarios between Indonesia and Bangladesh is presented based on secondary data sources. The study indicates the current challenges to implement new technologies in SME sectors. The research found out the recent technological development conditions in Bangladesh. The results indicated that the implementation of a web-based POS system is feasible for SMEs in Bangladesh if the challenges can be successfully overcome. The authors suggest priority steps be taken by the government and private agencies for POS system adaptation by the SMEs in Bangladesh.

1. Introduction
The small and medium enterprises (SMEs) are playing a significant role in developing countries’ economies. SMEs are considered as the backbone of the national economy of Bangladesh. SMEs are one of the vital driving forces of Bangladesh’s economy because of their contribution to poverty alleviation, creating new employment opportunities, assisting in rural development, and increasing the growth of manufactured and export goods. It also creates a great opportunity for women’s employment. SMEs are one of the most cost-effective injecting dynamism to production growth and contribution to the gross domestic product (GDP) in Bangladesh. According to the statistical data from Bangladesh Bureau of Statistics (BBS) [1], there were 78,18,565 SME establishment (22,29,546 urban and 55,89,019 rural) and 2,45,00,850 persons (2,04,49,132 male and 40,51,718 female) engaged in SME activities in Bangladesh by the year of 2013. The 21st century is a golden time for business. Recent technologies have made the world much closer and made the business processes more widely available to the world. Though it is a great field of opportunity for the economic development of Bangladesh, SME sectors are facing many ongoing problems. Alauddin and M. Manir [2] identified that the major challenges for SMEs in Bangladesh are – poor physical infrastructure, insufficient marketing of SME products, lack of entrepreneurship skills, lack of research and development facilities, absence of modern technology, etc. They mentioned that without the latest technology in the SME sector, it would be hard to improve the production rate and the quality of the product. The same
study found out that in most cases, the available technology is not enough for SME development. It is an utmost barrier for the SME products to the big market without scientific knowledge and equipment.

Though initially, it is tough to implement modern technologies widely among the SMEs in Bangladesh, it is possible to start from the short-range where the supporting technologies and experts are available. The matter of hope is that the government of Bangladesh has taken many steps to digitalize the country’s infrastructure. As a result, many developments and improvements have been done in the Information and Communication Technology (ICT) sector in the last two decades. Bookkeeping, record keeping, stock, and employee management are common terms in any size of business. In Bangladesh, most of the SMEs do these works in traditional ways like paperwork. As these works play a vital role in businesses, any related mistake can be hazardous for the company. An easy, common, and modern solution is to use the point of sales (POS) software or service in businesses. This provides real-time snapshots of performance, growth, and health of businesses. It helps managers or business owners to make decisions based on statistical data and reports concerning their business.

This study aims to evaluate the feasibility factors of the implementation of a web-based POS system in the SMEs of Bangladesh. The study also searches for the challenges and gaps to adapt technologies by SMEs in Bangladesh. Therefore, the authors suggested some priority steps be considered for wide technology adaptation by the SMEs in Bangladesh.

2. Literature Review

The definition of SME depends on various factors such as population, business culture, industrial growth and facility, and the level of international economic integration. Different countries use different variables like the number of employees, the value of fixed assets, yearly revenue, the technology used, etc. The values of these variables significantly differ from country to country. For these differences, it is hard to adopt a suitable worldwide definition of SMEs.

Different countries around the world define SME differently. For example, in the United State, the maximum number of employees should be 499. In Australia, a maximum should be 200 employees. In China, it is no more than 999 in the manufacturing sector. On the other hand, in the European Commission, the number of employees in an SME has to be fewer than 250 persons [3]–[5]. Tom Gibson and H. J. van der Vaartindeed [6] proposed an attractive and less imperfect formula of SME – “An SME is a formal enterprise with annual turnover, in U.S. dollar terms, of between 10 and 1000 times the mean per capita gross national income, at purchasing power parity, of the country in which it operates.”

Small and medium enterprises are playing an indispensable role in the overall economic development of Bangladesh. According to Bangladesh bank, there are more than 132 different sectors of SME development in Bangladesh [7]. Like the other developing neighboring countries, considering the SME sector as a driving force of industrialization, the government of Bangladesh has given much attention to SME development to achieve economic growth and narrow down the gap between poverty alleviation and income inequality. In 2010, the government of Bangladesh started at least formalities, fast, and low-interest loan facilities for the small, medium, and women entrepreneurs [8].

Bangladesh Bank defines SMEs according to the asset base and the number of staff employed [8]. Both small and medium companies are divided into three sectors – service, business, and industrial. Table 1 and Table 2 show the national standards for small and medium enterprises in Bangladesh. In service and business sectors for small companies must have fixed assets other than land and buildings worth 50,000-50,00,000 Bangladeshi Taka (BDT) and maximum employee of 25. For medium service and business companies, fixed assets other than land and building should be worth 50,0,00,000-10,00,00,000 BDT and should have a maximum number of employees as 50. In the industrial sector, small companies must have fixed assets other than land and buildings worth 50,000-1,50,00,000 Bangladeshi Taka (BDT) and the maximum number of employees as 50. For medium industrial companies, they must have fixed assets other than land and buildings worth 1,50,00,000-20,00,00,000 BDT and the maximum number of employees as 150 [8].
Table 1. National standard on the small enterprise in Bangladesh

| Sl. No | Sectors  | Fixed Asset other than Land and Building (Tk.) | Employed Manpower (not above) |
|-------|----------|-----------------------------------------------|-------------------------------|
| 01.   | Service  | 50,000-50,00,000                              | 25                            |
| 02.   | Business | 50,000-50,00,000                              | 25                            |
| 03.   | Industrial | 50,000-1,50,00,000                        | 50                            |

Source: [8]

Table 2. National standard on the medium enterprise in Bangladesh

| Sl. No | Sectors  | Fixed Asset other than Land and Building (Tk.) | Employed Manpower (not above) |
|-------|----------|-----------------------------------------------|-------------------------------|
| 01.   | Service  | 50,00,000-10,00,00,000                        | 50                            |
| 02.   | Business | 50,00,000-10,00,00,000                        | 50                            |
| 03.   | Industrial | 1,50,00,000-20,00,00,000 (Employed)          | 150                           |

Source: [8]

Point of Sales (POS) is one of the basic ICT solutions for businesses. It is a software solution that can record everyday sales, save history, and generate valuable reports based on business necessities. POS is used for accounting purposes. The generated information can be a very useful source of data mining and business analysis. Previously the POS system was offline. In recent times online web-based POS systems are the most popular. By implementing a POS system in a business, an entrepreneur can achieve extra advantages like – easy usability, real-time report generation on stock, sales report generation, visual representation of business profit or loss status, faster service, easy employee management, and easy monitoring. It also increases the efficiency and accuracy of a business [9].

For several reasons, SMEs in Bangladesh are still far behind the modern world in technological adaptation. Lack of support from the institutes, unfamiliarity with technology, lack of capital, lack of expertise, and rapid changes in technology are the main barriers that are preventing the SME entrepreneurs from investing in technology. Till now, the most common technologies among SMEs in Bangladesh are land-phones and basic feature mobile phones. Smartphones are getting popular among the new generation. The adults still use basic phones only for voice communication and simplicity. As the fast and uninterrupted internet service is still costly and unavailable in many places, general SME owners are not interested in using computer technology and the internet. According to a statistical report from the Bangladesh Bureau of Statistics (BBS) [10], only 11.2% of the small enterprises and 26.51% of the medium enterprises use computer technology in production. The remaining percentage of people SMEs still follow traditional methods to maintain transaction history, loss/profit, and other valuable and sensitive business data. According to a recent thesis study [11], only 14% of SMEs keep transaction customer data in electronic form, and 56% of them follow the manual method. Moreover, the transaction data stored in digital form is mainly used for accounting purposes only and not for data mining to predict customer behavior or business future.

Table 3. Computer Technology (CT) in production

|            | Small          | Medium        |
|------------|----------------|---------------|
| **Total**  | **Used CT**    | **Not Used CT** |
| 30890     | 3461           | 27429         |
| 2991      | 793            | 2198          |

Source: [1]

Table 3 shows the number of small and medium enterprises that do not use computer technology. According to the study conducted by Muhaiminul and Nasira [12], the introduction of modern technology can increase SME development in Bangladesh. Utomo, Sayyidati, and Rahmanto [9] showed that the implementation of POS systems in a small business could make the monitoring process of the sales transaction, profit/loss, inventory status, and stock easier and faster.
3. Methodology

This research followed a qualitative approach to collect information. The research was done remotely and the researchers relied on secondary data derived from different sources. Figure 1 shows the methodology of the study. Initially, the researchers searched through different search engines like google scholar, the web of science, and Scopus. Due to a lack of quality research papers in this field directly related to Bangladesh, the researchers considered other different valid sources of information like government websites and national reports. The researchers presented a comparison between Bangladesh and Indonesia in the context of ICT development and cloud computing adaptation among the SMEs. The comparison followed specific parameters like the current state of both countries in technological fields, the SME conditions, technological adaptation by the SMEs, internet adaptation, internet usage expansion rate, etc. Based on the data, the researchers decided whether it is feasible or not for Bangladeshi SMEs to implement similar web-based POS systems like Indonesia.

4. Result and Discussion

In this section, the researchers analyzed data derived from various sources. Firstly, a comparison of the current ICT development status between Bangladesh and Indonesia was made. The reason behind choosing Indonesia as a model of comparison is because the SMEs in this country have made some significant adaptation of cloud technologies like web-based POS systems. Bangladesh and Indonesia are both South-Asian Developing countries. Both countries started the development of the internet in the early 1990s. Statistically, Bangladesh is not much far behind in technological adaptation. So, it is easier to reach a benchmark that is not so far or difficult to achieve for the capability of Bangladesh. Then, a thorough discussion about POS adaptation among SMEs in both countries was made. Based on the data, the authors concluded the feasibility of web-based POS system implementation for SMEs in Bangladesh. From the yearly publication of the International Telecommunication Union [13], [14] the researchers collected data about ICT development in Bangladesh and Indonesia. Table 4 shows a comparison of ICT development between the two countries.

| Parameters                                      | Bangladesh | Indonesia |
|------------------------------------------------|------------|-----------|
| IDI 2017 Country Rank                          | 147        | 111       |
| IDI 2016 Country Rank                          | 146        | 114       |
| Fixed-telephone subscriptions per 100 inhabitants | 0.48       | 4.01      |
| Mobile-cellular telephone subscriptions per 100 inhabitants | 77.88     | 149.13    |
| International internet bandwidth per Internet user (Bit/s) | 9154.09   | 24946.89  |
| Percentage of households with computers        | 9.59       | 19.14     |
| Percentage of households with Internet access   | 14.50      | 47.22     |
| Percentage of individuals using the Internet    | 18.25      | 25.37     |
| Fixed (wired)-broadband subscriptions per 100 inhabitants | 3.77     | 1.89      |
| Active mobile-broadband subscriptions per 100 inhabitants | 17.79    | 67.30     |

Source: [13], [14]
From Table 4, it is clear that Indonesia is more developed than Bangladesh in ICT development. However, the positive thing is that Bangladesh has made significant progress in ICT development for the last two decades. According to the Bangladesh Telecommunication Regulatory Commission (BTRC) [15], the total number of internet subscribers in Bangladesh was 99,569 Million by October 2019, which is approximately 61.66% of the current total population. Among the internet subscribers, most of them are mobile internet users (94.20%), and others are WiMAX (0.04%) and ISP + PSTN (5.76%) subscribers. Figure 2 shows the total number of internet subscribers from the year from 2013 to 2019. The graph visually represents the increasing yearly rate of internet users in Bangladesh. The graph is showing that every year, the number of internet subscribers increases at a consistent rate, which is a major positive indicator for Bangladesh in ICT adaptation.

![The total number of Internet Subscribers in Bangladesh](image)

**Figure 2. Yearly growth of internet subscribers in Bangladesh (Source: [15])**

In Indonesia, the number of internet users also has increased over the last couple of years. A recent study showed that 85.6% of Indonesian minimarkets use a computer-based transaction system but not with full potential [16]. Dijaya et. al. showed that the point of sales system can be integrated with a vending machine for self-service scale micro-enterprises [17]. Paramita mentioned that early technical knowledge is playing a significant role in cloud computing based POS system adaptation among Indonesian SMEs [18]. The same study stated that Indonesian SME entrepreneurs consider security issues as a major concern while adapting a cloud-based POS system. Whatever, the ICT, as well as the use of cloud services like web-based POS among the SMEs, increases significantly. For example, it is mention about one of the leading Indonesian web-based POS service – Moka POS. Moka is a fin-tech start-up that focuses on building mobile point-of-sale (mPOS) for SMEs. This POS system offers services, especially for different kinds of SMEs like – cafe, coffee shop, beauty salon, barbershop or fashion, and accessories store [19], etc. Moka POS offers a variety of features such as point of sale, report generation, digital receipt, managing multiple orders, cash drawer management, a reward system for the customers, mobile payment, interactive dashboard, inventory management, employee management and so on. The SME owners can use the services according to their needs by paying a monthly subscription fee. Founded in 2014, Moka claims to have more than 35,000 retail subscribers and operations across 100+ cities in Indonesia by the year 2019 [20]. This achievement is a significant success for five years old startup.

According to Dewan and Nazmin [21], the implication of ICT in SMEs in Bangladesh can open diverse opportunities like easy communication and exchange of information among the SMEs, connection with the global market, optimize the production process and maintain a good customer relationship. In a case study, Hussain and Chen [22] pointed out that introducing women entrepreneurs with technologies can keep the SMEs running and ongoing improvement. M. Islam and S. Nasira [12] showed that the introduction of new technologies has various positive impacts on SME development in Bangladesh. Therefore, based on those previous studies, the authors concluded that technology adaptation by the SMEs in Bangladesh may open a new door for opportunities. Thus, it is feasible to implement technologies like web-based POS software among the SMEs in Bangladesh if the challenges can be successfully overcome.
Though recently, Bangladesh is developing its state in ICT adaptation, there are still many challenges to implement different technologies in the SME sector properly. One of the significant challenges for SME development in Bangladesh is the lack of electricity. Load shedding is a common issue in Bangladesh. Some parts of the country are still out of reach of electricity. Both rural and city areas face load shedding issue almost every day. Shimul and Tulon [23] mentioned that more than 90% of the farms in Bangladesh do not get enough or continuous electricity supply to run their business or production. Dewan and Nazmin [24] found out that software usage tendency among the SMEs is very low. The same authors found some challenges of ICT adaptation among the SMEs in Bangladesh. They mentioned that lack of skilled personnel in technical fields, lack of proper network infrastructure, security issues, cost of adaptation of ICT tools, and usability for the business are the major challenges to adopt technologies among SMEs in Bangladesh. They suggested that Bangladesh needs more advance infrastructural support with proper policies to truly implement ICT among the SMEs.

Md. Alauddin and Mustafa Manir Chowdhury [2] mentioned that modern technologies are not ensured for the SMEs in Bangladesh. They noted down that most of the SMEs in Bangladesh are not aware of modern technology. As the world is shifting almost everything to the digital environment, daily business operations are getting more difficult with the traditional methods. Without modern technologies, they cannot compete in the global business environment. Gupta and Seetharaman [25] found that some specific factors affect cloud computing adaptation by SMEs as – reliability, ease of use, cost reduction, security, and privacy, sharing, and collaboration.

Implementing the web-based POS system for SMEs in Bangladesh faces similar challenges of ICT adaptation by the SMEs. Currently, many vendors are offering a web-based point of sales system for SMEs. But the adaptation rate of this technology is still slow among the SMEs. To make this technology more available to the SMEs, Bangladesh needs to focus on some priority steps. Firstly, Bangladesh still lacks technological infrastructures like telecommunication towers, internet service providers, data centers, and equipment. Most of the advanced technology infrastructures are places in city areas. The rural areas are still far behind even basic technological improvement. The technological infrastructure must be developed to start technology adaptation by SMEs on a broad scale. Secondly, the latest technologies are not ensured for SMEs. Even the basic technologies to implement the web-based POS system like uninterrupted electricity and high-speed broadband or mobile internet are not available in many areas. These basic technologies must be ensured. Thirdly, one of the major constrains to adopt the technology by SMEs is the lack of proper knowledge and awareness about the blessing of technology. Many cases entrepreneurs are discouraged from adopting technologies even when they are available to them. To solve this issue, proper training and campaign must be arranged by the government and the private organizations to create skilled personnel in the technical field. Fourthly, most of the owners of SMEs in Bangladesh are used to traditional methods for managing their business. They feel less interested in adopting new technologies and consider them as extra trouble of maintenance. Proper campaign and marketing about technological adaptation by the global SMEs may change the fixed mindset of using traditional methods to run businesses. Finally, the implementation of technology is still costly for many SMEs in Bangladesh. Buying technical equipment such as computers, networking devices, internet package, and hiring extra employees to maintain the equipment is costly for the SME owners. If the cost of these issues can be reduced, SME owners will be more interested to adopt technologies in their businesses.

5. Conclusion
Small and medium enterprises are the main driving forces of a developing country’s economy. In Bangladesh, SMEs help to keep the economy running. However, without using the latest technologies, SMEs in Bangladesh will continue to lose many valuable opportunities to compete in the global market. Introducing basic technologies like a web-based POS system can be an initial step to utilize the power of modern methods of success in small and medium businesses. This study was aimed to find out the feasibility factors of implementing a web-based POS system among the SMEs in Bangladesh. The study found out that there are many opportunities in introducing technologies among SMEs. Therefore, it is feasible to implement a web-based POS software if the current challenges can
be carefully taken care of. As the POS technology is not widely familiar among Bangladesh’s SMEs, only a few quality types of research have been done in this field. Due to this limitation, researchers must relay government websites and reports published by the government organizations for valid secondary data. The researchers encourage future researchers to explore this research area and fulfill the knowledge gap by collecting primary data. The researchers suggest developing technological infrastructure, the arrangement of regular campaigns to increase awareness and knowledge about the benefits of using ICT in businesses to help people change their minds about adopting new technologies in businesses. Researchers also recommend reducing the implementation cost of technologies and make the technologies available to everyone.

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