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Review Article

Small & Medium Enterprises (Smes) – Insights of Bangladeshi Smes in Different Contexts of Adopting Cloud Computing

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Abstract: Small and medium-sized enterprises (SMEs) are the backbone for any country's national economy and Bangladesh is no exclusion. Unquestionably, SMEs does play pivotal roles to progress the economy of the country and the functionalities of SMEs are mammoth to lessen the country's poverty. This sector is especially suitable for the heavily colonised countries like Bangladesh owning to create jobs with much lower investment, reduce poverty and drive a resilient domestic economy. However, there are various challenges are present for Bangladeshi SMEs, which are hindering country's progress, and this is because of absence modern technology such as Cloud Computing. This paper is, therefore, an attempt to provide insights of SMEs including definitions and characteristics, general challenges and technology adoption risks especially for Cloud Computing adoption risks.

Keywords: SMEs, modern technology, Cloud Computing, technology adoption risks.

1: DEFINITIONS OF SMES

In the context of Bangladesh, the expansion of SMEs is a dynamic instrument for poverty mitigation and rapid domestic development. But, unlike so many other countries, in Bangladesh there is no specific or unique way of defining SMEs. The definition of SMEs depends on the different standards and principles used to measure the size of the business to define its classification (Hashim and Abdullah, 2000). There are different definitions in developed and developing countries and many of the definitions are not consistent with each other. Inaccurate measures are used to describe satisfactorily the size of the business in different industries (Hashim and Abdullah, 2000). I set out below some of the different definitions that have been proposed.

DEFINITION OF SMES IN THE EU:

The EU definition (Recommendation 2003/361/EC adopted on 1st January 2005), which is similar to the UK definition, includes a category called "micro enterprise".

Table 1: Definition of EU SMEs (Adapted from Berisha & Pula, 2015)

Category	Headcount	Turnover **	Balance Sheet Total **
Micro	<10	£1.7 million	£1.7 million
Small	<50	£8.2 million	£8.2 million
Medium	<250	£41 million	£35.2 million

[** The definitions are given above with the Euro values converted into Sterling at the rate applicable in June 2010].

DEFINITION OF SMES IN THE UK:

According to Berisha & Pula (2015), *"In the UK, sections 382 and 465 of the Companies Act 2006 define a SME for the purpose of accounting requirements. According to this a small company is one that has a turnover of not more than £6.5 million, a*

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balance sheet total of not more than £3.26 million and not more than 50 employees. A medium-sized company has a turnover of not more than £25.9 million, a balance sheet total of not more than £12.9 million and not more than 250 employees".

From the definition above it can be said that the UK Companies Act definition appears to be solely in terms of annual turnover (rather than number of employees). Both 'number of employees' and 'annual turnover' varies greatly from country to country and business sector to business sector, so standardisation of what defines an SME is not straightforward. In the following I will review alternative definitions before fixing upon a standard for Bangladeshi SMEs.

DEFINITION OF SMES IN SRI LANKA:

According to Cooray & De Silva (2007) & Sumanasena (2005), "the definition of SMEs in Sri Lanka is that small-scaled enterprises are those consisting of 5 to 49 regular employees whilst medium-scaled enterprise have 50 to 149 regular employees". Thus, in contrast to SME definitions in the UK and EU, Asian governments (such as Sri Lanka) classify business types (SMEs) primarily in relation to employee numbers.

DEFINITION OF SMES IN NEPAL:

According to Nepal Industrial Enterprise Act 1992, originally cited in Agarwal (2006), "the definition of SMEs in Nepal indicates that enterprises whose fixed assets are worth less than Nepal Rs 30 million are small firms and those with fixed assets worth between NRs 30 million and 100 million are medium enterprises". Again, a different method of classification – not in terms of annual turnover, nor number of employees – but in terms of value of fixed assets. This inconsistency in classification of business types complicates the selection of data sources classified as 'SMEs' and makes cross-comparison of different countries' policies and practices in relation to SME development more difficult to analyse. I am proposing to use the definition (below) proposed by the SME Foundation in Bangladesh (2015) but will reflect later on whether the lack of a standardised definition is a confounding factor in comparing my findings to developing countries elsewhere.

DEFINITION OF SMES IN BANGLADESH:

According to the SME Foundation (2015) and National Industry Policy Bangladesh (2010) the definitions of Bangladeshi SMEs of various types are below. From the definitions below, it is clear that none of the SME definitions are identical to each other country mentioned, making country-to-country comparison more difficult. Therefore, it is difficult to select the appropriate definition. In my research, I am going to use the definition of SMEs defined by National Industry Policy (2010) because of its criteria, which are more suitable for defining the overall SME sector in Bangladesh.

Table 2: Definitions of Bangladeshi SMEs (Adapted from: National Industry Policy (2010)).

SI	Type of Industry		The amount of investment (Replacement cost and value of fixed assets, excluding land and factory buildings)	Number of employed workers
1.	**Cottage Industry**		Below 5 lakh	number of workers not exceed 10
2.	**Micro Industry**		5 lakh to 50 lakh	10 to 24
3.	**Small Industry**	Manufacturing	50 lakh to 10 crore	25 to 99
		Service	5 lakh to 1 crore	10 to 25
4.	**Medium Industry**	Manufacturing	10 crore to 30 crore	100 to 250
		Service	1 crore to 15 crore	50 to 100
5.	**Large Industry**	Manufacturing	More than 30 crore	More than 250
		Service	More than 15 crore	More than 100

After knowing different definitions of SMEs, it is now required to know what are the possible characteristics of Bangladesh SMEs? In my opinion, knowing only the definitions makes it not possible to describe one overall characteristic of an SME. Therefore, it is better to define the sample in terms of a variety of characteristics of SMEs. In the following section I will explain in detail the variety of characteristics of SMEs in Bangladesh.

2: SMALL & MEDIUM ENTERPRISES (SMES) – WHAT ARE THE CHARACTERISTICS?

For a decade many researchers have been showing their interest in SMEs. They have discovered that two thirds of the firms are SMEs globally and those firms are playing a pivotal role in countries' economies (Islam *et al*., 2011). Moreover, the performance of a nation is closely connected to the performance of SMEs (Islam *et al*., 2011). According to Smallbone and Wyer (2000), SMEs are essential mechanisms in business, and it is commonly documented by Islam *et al*., (2011) that SMEs are making a significant contribution to national and global economic progress because SMEs are the fundamental sources of employment in many nations. SMEs not only play a pivotal role in creation of employment but also, they are a significant component in that SMEs provide communal and financial welfare with new products and technological sources of

innovation (Alshamaila, 2013). Traditional views of SMEs are that they are equal to the bigger firms with only differences in size (Akbari, 2012). According to Akbari (2012), "it is currently a well-known fact that the very size constraints of the SMEs make them distinct from their larger counterparts". The characteristics of SMEs are important when SMEs are considering technology adoption strategies (Akbari, 2012). According to Welsh, White & Dowell (1982), the main differentiator between a large and SME is a level of accessible assets to the SMEs, which is known as "the SME's resources poverty.

According to Simpson and Docherty (2004), a significant amount of literature has been investigated to identify the defining characteristics of SMEs and their approach to technology adoption. Byrd (2009) identified that in relation to many SMEs, they differ from the larger business in many ways such as a product or service, smaller market choices, on some occasions SMEs have a single product and a single customer service and they like to take initiatives to reduce production cost (Storey, 1994; Storey and Sykes, 1996). Byrd (2009) also identified that most of the SMEs manage to support initiatives by starting business with one person or number of entrepreneurs to survive. In relation to SMEs management practices Akbari (2012) and Alshamaila (2013) claimed that most of the SMEs have an owner-manager management model and unified management practices. In most of the cases, the owner of an SME is the manager thus, they have a significant influence on decision making within the business, which indicates that the esteem of owners'/ management is needed for adopting new technologies within the business (Murphy *et al*., 1996). Alshamaila (2013) mentioned in her study that there are a number of SME characteristics available. The table below shows the main characteristics of SMEs.

Table 3: Characteristics of SMEs (Adapted from: Alshamaila, 2013; Islam *et al*., 2011)

Characteristics of SMEs	Meaning	Source
Origin of enterprise	*"Origin of enterprise in small firms, where ownership and management were typically combined in one or more individuals and future goals for the business might be determined as much by personal lifestyle and family factors as by commercial considerations".*	(Smallbone, Leig and North, 1995)
Duration in operation	*"Duration in operation may be associated with learning curve and significantly linked to business success, broader business experience and more prior start up experience, and to believe that they had less control of their success in business, than unsuccessful entrepreneurs".*	(Krisiansen *et al*., 2003; Duchesneau and Gartner, 1990)
Size of firms	*"Size of firms reflects how large an enterprise in employment terms, which is significantly linked to better business performance".*	(McMahon, 2001)
Capital Source	*"Greater dependence upon external finance associated with better business growth and financial flexibility is significantly correlated to business success".*	(McMahon, 2001; Krisiansen *et al*., 2003)
Initiatives	*"Small business are usually begun by a single person or a group of entrepreneurs, and therefore this type of business tends to support initiatives".*	(Megginson *et al.*, 1994)
Specialisation	*"SMEs are usually specialised in a single product and sometimes they may have only a single buyer comparing with larger firms, they tend to have smaller market scope, and always attempt to reduce production cost".*	(Storey, 1994; Simpson and Docherty, 2004)
Survival and growth	*"Small businesses usually focus on survival and independence rather than growth. Therefore, growth in SMEs is relatively slow; however, it does usually tend to be incremental and steady".*	(Curran *et al.*, 1996; Bridge *et. al.*, 2003)
Availability of resources	*"SMEs have a modest resource base, a lack of economic clout and suffer from weak asset bases. They are likely to have a limited availability of resources in terms of time, money and expertise".*	(Wymer and Regan, 2005; Bharati and Chaudhury, 2006)
Planning	*"SMEs usually have limited formal planning and control procedure mechanisms in the business".*	(Chell *et al.*, 1991; Bharati and Chaudhury, 2006)
Control mechanism	*"Usually the manager is the owner of the business. Control mechanisms in small businesses tend to be centralised and have a low level of formalisation. The decision-making authority within a small firm is held personally by the owners".*	(Chell *et al.*, 1991; Murphy *et al.*, 1996)

From the discussion above, it is clear that SMEs have a huge importance for a developing country like Bangladesh. For Bangladesh, SMEs play a decisive role for economic development and business success and contribute a lot to the national economy in Bangladesh (Hossain *et al*., 2009; Islam *et al*., 2011; Ahmed, 2003; South Asia Enterprise Development Facility, 2013; Asian Development Bank (ADB), 2002). SMEs in Bangladesh, however, are struggling and cannot perform well owing to many barriers (Abdin, 2010). At this point of my investigation, it becomes important to know those barriers that Bangladeshi SMEs are facing. Thus, in the section below I will focus on those challenges with which Bangladeshi SMEs are struggling.

3:SMALL & MEDIUM ENTERPRISES (SMES) – WHAT ARE THE CHALLENGES/BARRIERS IN BANGLADESH?

In Bangladesh, SMEs play a dominant role in the national economy as well as contributing to gross domestic product (Abdin, 2010). Apart from some nourishment industries, medicine companies, adhesive factories and telecoms businesses, the remainder of the business entities are SMEs in Bangladesh and they are almost 6.0 million (Abdin, 2010). These SMEs are producing about 50% of the country's business output every year by generating the largest amount of employment and by contributing import substitution in many ways, creating low price class products, creating import subsidiary products and by saving oversees currencies (Abdin, 2010). But the question is what are the initiatives government has taken to boost SMEs to get their support to make the country a middle-income country?

According to Abdin (2010), the government has already taken some initiatives to support SMEs such as establishing SME foundation, dealing with SME sectors' problems and facilitating and promoting SME development. Abdin (2010) claimed in his article "Bangladesh's SMEs are facing so many challenges" that the government's key achievement is building a SME Foundation for encouraging SMEs and to direct financial providers to simplify SME loans for very poor SMEs. But still there are many things that SME Foundation are unable to perform due to inadequate resources and policies (Abdin, 2010). I will now address the various barriers and challenges that SME subdivisions are facing at the moment in Bangladesh.

- **Insufficiency of Resource and Information:**

There is huge insufficiency of raw materials in Bangladesh, which obstructs the ability of SME subdivisions to be export friendly and restricts SMEs' capability of reaching further stages in global business expansion (Ahmed & Chowdhury, 2009). In Bangladesh, SMEs have much less capacity to use information technology (Miah, 2006). Only 1% - 2% of SMEs are using accounting software packages and about 15% of SMEs are using computers in their business. In addition, in terms of SME use of the Internet, this proportion is just below 10% (Ahmed & Chowdhury, 2009). The figures above indicate that the lack of experience and inadequate information sources, SMEs are suffering from operational underperformance (Abdin, 2010).

- **High Employee Turnover and Low Productivity:**

It seems that because of inadequate development in SMEs (especially in IT-related adoption), a large number of skilled employees are leaving SMEs because they believe that SMEs are very good as knowledge originators but not good enough for knowledge retention (Ahmed & Chowdhury, 2009; Levy *et al*., 2003). In Bangladesh, SME subdivisions are employing nearly 82% of workforce but, unfortunately, producing only 50% of business output, which shows that the workforce in SME subdivisions are really less productive (Abdin, 2010).

- **Poor Physical Infrastructure and Utility Support:**

There is a tendency in Bangladeshi peoples' minds that industrialization should be urbanized, and capital based, and this is owing to an inadequate supply of infrastructure amenities (Abdin, 2010). At present a basic utility like electricity supply has improved but it is still not easy to get continuous supply in rural areas (Abdin, 2010). Other utilities such as gas, water, roads and highways are obstructing the development of SMEs in respect of making supply chains efficient or transport of goods downstream – especially from rural areas. Hostile topographical circumstances increase transport costs (Ahmed & Chowdhury, 2009). At the moment, poor infrastructure and disrupted utility supply is one of the main challenges for Bangladeshi SMEs (Abdin, 2010).

- **High Bank Interest Rates and Absence of Security Free Bank Loans:**

At present for a Bangladeshi SMEs, bank loan interest is 13% set by the central bank of Bangladesh, which is relatively too high according to Abdin (2010). For SME owners to retain a profit margin with 13% high interest on loans, hiring employees, paying wages, rents and utilities, they need to sell their products at more than 50% more than their production cost, which is just impossible. To get competitive advantage SMEs need to produce high quality products but double-digit bank interest rates makes achieving those advantages unthinkable (Abdin, 2010). They (SME owner/manager) need finance to bring their entrepreneurial dreams into reality but they do not have a guarantor to get a bank loan (Abdin, 2010). Bangladesh Bank, the central bank of Bangladesh, takes the view that SMEs are at the extreme risk of borrowers since they do not have capabilities to meet the bank's guarantee requirements (Abdin, 2010). According to Ahmed & Chowdhury (2009), only 15% - 20% of SME proprietors have fixed assets and banks are issuing loans based on those assets. Therefore, about 80% of the SMEs are not getting bank loans, as they do not have fixed assets to produce as guarantor. Lack of access to bank loans is a serious inhibitor to SME development – certainly to investment in ICT technologies.

- **Availability of Advanced Technology:**

One of the key barriers to the expansion of Bangladeshi SMEs is inadequate technology being used. Many SMEs cannot develop because the difficulty in adopting technology (Ahmed & Chowdhury, 2009). Abdin (2010) found out that majority of the SMEs in Bangladesh are using local machinery and in-house

technology (for limited use only) to produce products but the reality is that those products are not sufficiently productive to meet market requirements. Moreover, there are a lot of Indian and Chinese low-cost products available in the Bangladeshi local markets. Therefore, Bangladeshi SME owners or entrepreneurs are losing income owing to not having sufficient technical knowledge (Abdin, 2010).

- **Lack of Sector Specific Skilled Manpower and Absence of an SME Entrepreneurship Program:**

The expansion of Information and Communication Technology is improving but, in Bangladesh, there are too few high standard ICT academies available with the full equipment of advanced technologies for our fast-developing industrial subdivisions. These would be needed to provide training to people to hire in that area (Abdin, 2010; Ahmed & Chowdhury, 2009). Quite surprisingly in Bangladesh there is not a neither single training agency nor academic institute available for SME entrepreneurs to undertake learning and training required, which shows that SMEs are not getting skilled manpower to perform tasks to deliver and execute their business plan (Abdin, 2010).

- **Lack of Government Support:**

To start a business whether it would be small or medium size, business owners need a series of clearances, registrations and licences from different authorities and even from a different ministry of the Bangladeshi government. Completing those formalities is difficult for a normal person (Abdin, 2010). Moreover, they need to pass bribes to almost every desk with their file, which is highly demotivating for them (Abdin, 2010). According to Abdin (2010), Bangladesh government should have taken different approach for the SME owner/manager to make procedures easier to get all the clearance done from the same authorities under the same roof to save times and unnecessary hassle in order to make process faster to start a business and to make SME owner/manager satisfied.

- **External Shocks:**

Compared to large businesses, SMEs are relatively weak in terms of decision-making, structure of management and business planning, which exacerbates the problem of SMEs being able to cope with many business jeopardies and uncertainties (Fatai, 2010). In addition, SME subdivisions are vulnerable to the financial and economic circumstances (Suh, 2010). The impact of external shocks is that a majority of SMEs are facing a wider variety of uncertainties and jeopardies, which are rooted in the combination of internal and external environment of the businesses. Similarly, when it comes to technology adoption, owner/manager or SME subdivisions necessarily do not want to put their business in that situation where risks and uncertainties are associated.

The barriers above mentioned are in general for Bangladeshi SMEs but however, there are a lot of opportunities for Cloud Computing solutions that Bangladeshi SMEs may use to overcome such barriers - in order to expand their business functionalities and to reduce their vulnerability to changes in the external environment. In the below, I am going to present some of the opportunities of Cloud Computing in Bangladeshi SMEs.

4: SMALL & MEDIUM ENTERPRISES (SMES): WHAT ARE THE OPPORTUNITIES OF CLOUD COMPUTING IN BANGLADESH?

Discussion above in my research it is clearly mentioned that Cloud computing play a pivotal role for the business organizations especially for the SMEs. However, the opportunities of Cloud computing in regard to SMEs are not clearly clarified. We know that Cloud computing is an up-to-date technology and at present Cloud Computing is using by diverse range of business organizations especially middle and large organizations. In Bangladesh, small business firms are also started using Cloud Computing but still most of the Bangladeshi SMEs are not fully aware of the benefits of Cloud Computing. Different study (such as Oliveira & Martins, 2010 & Adam & Musah, 2014) suggests that Cloud Computing guarantees in the vital competitiveness and expansion of SMEs and after adopting Cloud computing SMEs could effectively use the up-to-date technology. Therefore, it is now really important to discuss the overall opportunities of Cloud computing, in regard to the Bangladeshi SMEs. Donelaicio (2012) and Taylor *et al*., (2010) summarised the following opportunities of Cloud Computing for the SMEs.

- **Cost Savings/Reduction:**

According to Oliveira & Martins (2010), *"after the adoption of Cloud Computing, SMEs can be able to effectively utilize modern technology along with cutting upfront cost".* Khan (2015) also focused that Cloud Computing is customarily supportive for business firms in IT expense cutting. The reason it is supportive because cost cutting always supports any types of business to maintain processes and capital outlay to smallest amount. In addition, Cloud Computing further saves considerable cost laterally with the needs of applications and zero in-house server storage (Gupta *et al*., 2013). Moreover, Cloud Computing reduce operational costs of the firms due to using minimum on-premises infrastructures such as power cost, administration cost or even air conditioning cost (Zhang *et al*., 2010), which could be really beneficial for the Bangladeshi SMEs because of their less investments.

- **Scalability/Suppleness:**

According to Khan (2015), now day's majority of the business firms are keen on data management centres. This is because of the heavy suppleness and the

nature of the Cloud Computing. As a result, Cloud Computing experts always maintain private or hybrid or even shared Clouds to get the quickest possessions distribution in a precise environment. By using this controlled environment process, overloading does not occur because all the systems are accomplished appropriately at all the times (Conway *et al*., 2014). Bangladeshi SMEs could use advantages of shared Clouds to get all the necessary resources quickly and properly in order to reduce the Cloud maintaining cost individually.

- **Consistency:**

Consistency is one of the best advantages of Cloud Computing because CC service providers are exceedingly reliable on their services. Cloud Computing is so consistent compared to in-house IT substructures. Most of the Cloud service providers are 99.99% reliable and they provide 24/7 services in 365 days (Khan, 2015). In case of any difficulties such as system failure or applications failure, Cloud services could be straightforwardly moved to the next available servers, which provides zero risks of service users (Gupta *et al*., 2013). In terms of Bangladeshi SMEs, consistency of Cloud Computing services is must needed because most of the SMEs owners are not highly computer literate to understand the problems. So, they must need consistency services of Cloud Computing into their businesses.

- **Maintenance:**

Maintenance is another important opportunity of Cloud Computing for the business firms. This is important because Cloud Computing does not necessarily need to install every computer. In addition, Cloud Computing is easy to accomplish and could be reached from anywhere in the world (Khan, 2015). There are lot of supportive features available of Cloud Computing and by using those features CC supports Cloud providers to uphold, host, enhance and examine the applications in Cloud. Weinhardt *et al*., (2009) strongly mentioned in their study that by using features of Cloud Computing, designers could adapt and unveil diverse programs as compared to 'setting up systems' and 'substructures themselves'. Bangladeshi SMEs could be beneficial of it because they have got very limited investments and resources to maintain. As Cloud Computing offers the advantages of not installing them in every single computer so that SMEs owners do not need to hire any IT experts to install for them. In this way, Bangladeshi SME owners could save lot of money, which they could reinvest into their business.

- **Innovation:**

Cloud Computing is relatively new concept for the Bangladeshi SMEs, but it is very innovative. Because Cloud Computing always offers business firms to network with their customers, staffs and business partners in a new and innovative way (Khan, 2015). By using Cloud Computing services, every business firms could possibly get extremely incredible business chances. These chances could support business firms to make real-time network and innovation to flourish their business (Alshamaila *et al*., 2013). Bangladeshi SMEs could also get this benefit of Cloud Computing to boost up their business and to make their business innovative.

- **Numerous Operators at Same Time:**

I have mentioned earlier that Cloud Computing is really good for using shared resources, which increase the effectiveness. Cloud Computing offers numerous operators' accessibility at the same time and by doing so, users not only shares only computing resources but also "allocate dynamically as per demand" (Khan, 2015). Moreover, Cloud Computing always support users to access or update their data via only one server deprived of purchasing certificate (Zhang *et al*., 2010). For Bangladeshi SMEs, this is the perfect benefit that they can be use of because many SME owners can share the same shared Cloud and can get and exchange all the resources and data for their businesses. Again, SME owners do not need to necessarily pay extra money for buying license so that they could save that money and could reinvest into their business.

- **Agility:**

In today's competitive financial situation, the skill to retort to quickly shifting customers' requirements is a vital competitive differentiator (Azarnik[a] *et al*., 2012). However, agility for SMEs is not only a competitive advantage rather it is vital for SMEs to survive in nowadays-fast moving business environment. Cloud Computing increase the agility of business by enabling businesses to speedily adjust processes, products and services to fulfil the changing requirements of the business market (Berman *et al*., 2012). This is perfect for the Bangladeshi SMEs because at present Bangladesh is economically growing faster and recently the country achieved low-middle income countries status by the World Bank. So Bangladeshi SMEs need to be more agile and adaptive in order to support the state's economic growth.

- **Minimize Licensing New Software:**

According to Khan (2015), *"Cloud Computing strategies are used to custom tailor solutions to the company and thus company needs Cloud IT with fully integrated, dynamic and robust computer systems with completely web based".* By using this strategy, files, applications and emails could be accessed quickly and easily over the Internet so the requirement of software and hardware is decrease. As a result, business firms' needs minimum licensed software therefore; business firms could grow without investing huge amount on licenses (Lawton, 2008).

- **Cloud Computing is Green:**

At present in Bangladesh, Cloud Computing is not a hot topic but near future Cloud Computing could

be a hot topic and most of the businesses will be using Cloud services. This is because Cloud Computing is the finest and the greatest and effective future use in any kind of businesses (Khan, 2015). According to Blaisdell (2014), *"companies can increase their return by 200% by using Cloud Computing".* On the other hand, software firms and IT firms are essentially changing to adopt advanced technology such as Cloud Computing. In this way, software and IT firms could really save the environment by utilizing a smaller number of servers and other necessary resources. This is also important for Bangladeshi SMEs because Bangladesh is highly populated country where green environment is must needed. So, by using Cloud Computing services Bangladeshi SMEs could save the environment, which would be really good for the country and the countrymen as well.

From the discussions above, it has been identified that there are various opportunities of Cloud Computing, which are available for the Bangladeshi SMEs. However, owing to the fact that most of the Bangladeshi SME owners' or managers are at immature stages of implementing and using modern technology such as Cloud Computing. Therefore, they (SME owners or managers) need to face some other challenges if they want to adopt Cloud Computing in their business. In the below, I am going to present some of the Cloud Computing adoption challenges for the Bangladeshi SMEs.

5: SMALL & MEDIUM ENTERPRISES (SMES): WHAT ARE THE DRAWBACKS OF ADOPTING CLOUD COMPUTING IN BANGLADESH?

As already discussed earlier in detail of various potential opportunities or advantages of Cloud Computing that Bangladeshi SMEs should and could get. However, there are still some factors that could be worrying owners or management of the Bangladeshi SMEs. Hence, it is now necessary for me to discuss below those drawbacks in my research that Bangladeshi SMEs possibly could have after adopting Cloud Computing.

- **Absence of Control:**

As I have mentioned earlier in the above sub-heading that Cloud Computing is fully controlled and monitored by the Cloud service providers and therefore, consumers do have very less amount of control over Cloud Computing services such as data and applications (Khan, 2015). Moreover, consumers do not have any access of organizational tasks such as access to server, updating managerial tasks or updating even firmware (Gong *et al*., 2010). In terms of Bangladeshi SMEs, it could be real concern because most of the SME owners would have loved to do their managerial tasks by themselves but however; Cloud Computing would not give them those opportunities. As a result, they might have thought Cloud Computing is not important because physically they cannot resolve any issues and they need to rely on service providers, which will make them less interested of using Cloud Computing.

- **Reliance of Network and Fundamentally Need an Internet Connection:**

Network dependence is one of the biggest drawbacks of Cloud Computing. Because Cloud Computing is entirely relying on Internet. Due to full network reliance on Internet controlled to lying service outage at any time (Khan, 2015). Moreover, there is a possibility of service interruption during file transmission, transactions or some other tasks. Therefore, daily tasks could be delayed (Stallings, 2007). This is the real time drawback for the Bangladeshi SMEs because at present there is not strong enough Internet coverage all over Bangladesh. Although nowadays countrymen are using mobile Internet but however, those Internet service providers cannot assure strong network services all the times. Therefore, SME owners in Bangladesh would be thinking twice before they entirely rely on Cloud Computing to perform their daily tasks.

- **Risk of Security Breaches and Attacks:**

According to Yang & Tate (2009), *"every single Cloud computing component is highly accessible from Internet server however, Internet connected services are not secure and sometimes IT teas have to suffer from hard security breaches and attacks".* In Bangladesh, this risk is really high especially for Bangladeshi SME owners. This is because most of the Bangladeshi SME owners are not highly knowledgeable of computing therefore, they might not use Cloud Computing services accordingly. So, for Bangladeshi SMEs it is a real challenge because computer hackers or third-party users could easily get access of their data and information.

- **Migration Issues:**

This is always challenging for anyone to migrate to Cloud Computing because the migration process is very tricky. Marston *et al.,* (2011) mentioned in their study that migration to Cloud is a real issue because there are many common experiments in this regard, which could be appropriate Cloud vendors identification, effectual management of Cloud possessions and obviously changeovers of IT infrastructures and investments. This is a common challenge for the Bangladeshi SMEs because they do not have right knowledge of Cloud Computing. So, it would be difficult for them to choose the right Cloud providers. Because without knowing the facts of Cloud Computing they need to entirely depends on service providers by believing that they would be doing the right job for them. But however, there is possibility of dishonesty from the service providers as a result, migration could be negatively impacted or SME owners need to pay extra money, which will be highly impacting on their investments.

- **CONTINUOUS DEVELOPING:**

Customers are very fascinating, and their demand or requirements are keep changing therefore, Cloud Computing, networking, storage and requirements of interfaces are keep changing as well. According to Durkee (2010), these continuous evolving restrictions demonstrates that Cloud Computing needs to evolve over time cannot be static. This would be the real concern for the Bangladeshi SMEs because first of all they are not highly literate so every time some evolving happens into Cloud, they might be thinking that why do I need to accept those changes. Therefore, they might be stopping using Cloud Computing by thinking that using Cloud Computing is too much hassle.

It has been discussed earlier that there are many opportunities of the Cloud Computing that Bangladeshi SME owners' or managers' can take full advantages of it into their businesses. However, it has also been discussed that there are many general challenges are present in Bangladesh for the SMEs. In addition, there are very specific challenges of adopting Cloud Computing, which Bangladeshi SME owners/manager needs to face. Furthermore, after implementing Cloud Computing, SMEs need to deal with various possible adoption risks, which are unavoidable but could be manageable. In the section below, I am going to present those adoption risks.

6: SMES AND CLOUD COMPUTING – WHAT ARE THE POSSIBLE ADOPTION RISKS OF CLOUD COMPUTING FOR SMES?

Many scholars have been mentioned many associated risks of adoption of Cloud Computing but Bannerman (2010) has categorised the main risks emerged of adopting Cloud Computing in his study. The categories related to the risks are follows:

- **SECURITY:**

Security is the top ranked Cloud Computing adoption risk (Bannerman, 2010). Key adoption risks are nefarious usage, insecure interfaces, issues of collective technology, data loss or leakage, account hijacking and uncertainty due to "security by obscurity" (Cloud Security Alliance, 2010). Security is the biggest risk because of the high level of abstraction. Customers cannot see what their systems are doing in the public Cloud and it becomes difficult to determine whether their systems are secure. Security is the concern because customers always want to see visibility and transparency of operation but under Cloud Computing they cannot see many kinds of operation (Bannerman, 2010).

- **LOCK-IN:**

Owing to the rapid development of different Cloud Computing offerings many are highly proprietary in nature, generating a risk that subscription to a CC provider whose platform is not ultimately successful will incur extensive costs in migrating to different providers (Bannerman, 2010). According to Bannerman (2010), rapid emergence creates challenges in migrating data and applications to the Cloud or switching Cloud providers and puts customers at significant risk if the need arises for systems to interoperate across Cloud and in-house environments or to retrieve data and/or applications if a Cloud provider withdraws from the market. For SMEs in Bangladesh with little experience of using CC solutions (DaaS, SaaS), the demands of interoperability and of planning for contingencies when alternative providers may be required can be prohibitive.

- **CONTROL:**

This group of risks results from the reality that control over an organisation's data and systems execution ultimately passes to a third-party service provider in Cloud Computing (Bannerman, 2010). Bannerman (2010) also claimed in his study that this could raise important concerns and barriers to Cloud adoption because a change in control means a change in risk because, in cloud, users' do not have any control over any changes, but providers do. Thus, if providers make any change, users' may not be able to control. These concerns represent part of the downside to the benefits of Cloud Computing, resulting from not owning the infrastructure (Bannerman, 2010). For Bangladeshi SMEs with the little knowledge of using CC, change in control could be one of the top adoption risks.

- **LEGAL AND SERVICES:**

Legal risks include compliance with jurisdictional laws and regulations, legal liability, contracts and audits (Bannerman, 2010). Depending on the nature of the data and the jurisdiction, regulations may apply to where data is stored, how it is handled and the procedures under which it may be accessed or seized by the courts or government. Cloud virtualization could cause data to be moved around Cloud environments, placing it under different state and national laws and even result, unknowingly, in the owner becoming liable for breaching regulations (Bannerman, 2010). On the other hand, service category relates to service features and levels, service availability and reliability and support. But due to the utility nature of Cloud Computing, services and service levels are 'commonly-like' in nature with 'iron-clad' guarantees on services, availability, reliability and support rarely provided (Bannerman, 2010). However, in the context of Bangladesh, there are very limited legal risks presents therefore, there is no guaranty that customers' data will be monitored or regulated by the authority, which is definitely a potential risk.

- **PERFORMANCE & COST:**

According to Bannerman (2010), the system performance of Cloud Computing is slower, and more variable compared to on-premises systems. Moreover,

performance is constrained by Internet speeds, network quality and the distance between the user and the various Cloud service providers. So, if performance were critical in-service level agreements then the Cloud would be a risky option (Bannerman, 2010). Bannerman (2010) raised a question in his study whether it is that simple in practice that a Cloud user only needs to pay for what they use and when they use the service? Accurate predicting and measuring of spending for Cloud use is more difficult under an "on-demand" costing model. Moreover, the uncertainty about whether the required instances were oversubscribed or under-used makes costing unreliable (Bannerman, 2010). So, this is a real risk for business firms/customers to lose control of IT budgets and spend more money than they need to under this model (Bannerman, 2010). Such risks are, of course, critical in the context of SMEs in Bangladesh operating with very tight margins and frequent cash flow problems.

- **COMPETENCIES:**

Cloud computing draws on legacy client-server and service-oriented architectures; it represents a new bundling of pre-existing technologies. Most of the Cloud adopters do not have relevant knowledge and skills to build and deploy Cloud applications as quickly and efficiently as the hype suggests is possible and there is a steep learning curve with this computing model (Bannerman, 2010). Moreover, Cloud service models and platforms differ in their technical makeup and usage requirements so experiential-based learning can be a barrier to realizing benefits through Cloud adoption (Bannerman, 2010). This condition is more likely to be true of majority of the Bangladeshi SMEs owning to not having required knowledge and skills to adopt CC.

7: CONCLUSION

To conclude this paper, it can be said that modern age is the golden age of SME businesses. Therefore, the idea of SME businesses is developing daily basis by establishing ideas with different techniques. The SME businesses in Bangladesh have a strong position in this technological based competitive business market. However, in order to compete the competitive business market, SMEs are required to continuously upgrade themselves by adopting modern technology like Cloud Computing by dealing with all the possible challenges, by using all the possible opportunities of the modern technology and of course by taking possible adoption risks in order to remain the best in the market.

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