Benefits and Challenges of Cloud ERP Adoption by SMEs

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Abstract

Small and Medium Enterprises (SMEs) play a pivotal role as the backbone of the emerging economy, especially in a populated developing country like Bangladesh, where it can generate mass employment by engaging people with limited skills and resources. These SMEs are under constant pressure from their supply chain partners to improve their operational efficiency by optimising their business processes and practices. In this context, the adoption of cloud-based Enterprise Resource Planning (ERP) system can be considered as an economical solution for them in managing their business processes more efficiently. Some studies have been conducted on ERP implementation and post-implementation performance evaluation from the context of large companies of the developed countries. However, a minimal number of studies have been conducted on the SMEs of developing countries, taking into account their different business settings and environment. This study seeks to explore the potential benefits and challenges of cloud ERP adoption concerning SMEs of developing countries. This study argues that SMEs can adopt cloud ERP as many of the benefits are more relevant for them.

Keywords: Cloud Computing, Enterprise Resource Planning, SMEs.

1. INTRODUCTION

Small and Medium Enterprises (SMEs) have played a pivotal role in achieving phenomenal growth in production, exports and employment in this era of an intense global competitive market. This SME sector helps in boosting up the national economy by generating new employment opportunities which require less capital expenditure as well as lower establishment cost (SME Policy, 2019). In Bangladesh, there are around 7.8 million SMEs which contribute around 25% of its GDP (ADB, 2015). The Government of Bangladesh is trying to create an SME-friendly environment to increase the GDP contribution of SMEs from 25% to 32% (SME policy, 2019). To achieve this goal, the Government is taking various initiatives based on Information and Communication Technology (ICT) support system to increase efficiency and innovativeness of SMEs (SME Policy, 2019).

Bangladeshi SMEs, which are an integral part of the supply chain networks, have begun to confess the stark reality of intense competition where they are struggling to survive rather than a contest. These SMEs are under continuous pressure from their supply chain partners to improve their efficiency, agility and compliance status to
prove them highly adaptive in a very volatile business environment. Furthermore, the performances of these SMEs are no longer measured in terms of their stand-alone efficiency; instead, it is calculated by its entire supply chain performance (Thakkar, 2009). Thus, SMEs need to communicate with their supply chain partners about their performance metrics on a regular basis. Such performance measurement has raised the burden on SMEs to set up their own information system to achieve customer requirements within short lead time.

This paper is organised as follows: section 2 discusses the background of the study; section 3 explores the existing literature on cloud ERP to understand its potential benefits and challenges; section 4 and 5 describes the rationale of cloud ERP adoption by SMEs in the context of a developing country in general and Bangladesh in particular respectively. Section 5 concludes by presenting the summary of the study.

2. BACKGROUND OF THE STUDY

SMEs, which are a vital part of the various supply chain networks, cannot review their internal business processes systematically and hence cannot fulfil business requirements very quickly and efficiently. They need to update their operational information more frequently in order to monitor the status of their operations. Coordinating activities throughout the supply chain is a very complex task and requires coordination among implementation units as well as amongst players within the markets. To complete this task, SMEs, as a part of the supply chain network, require real-time information to monitor their progress. It is challenging to ensure real transparency throughout the entire supply chain and to monitor it through onsite control without the help of modern technologies.

For this reason, the supply chain partners need to develop a strategic alliance among themselves through the exchange and management of their operational data - which cannot be implemented without the help of IT application. In Bangladesh, SMEs lack IT infrastructure and necessary skills, which result in a widening gap between SMEs and other supply chain partners in terms of improving operational efficiency (Miah, 2007). Since cooperation among all supply chain partners and SMEs play a vital role in gaining competitiveness, Bangladeshi SMEs should seriously consider establishing cost-effective IT system to improve their business performance of entire supply chain network (Pan & Jang, 2008; Sultan, 2010).

Driven by the need to obtain even greater efficiency, precision and speed in time to market, in recent years, many Enterprise Resource Planning (ERP) packages have become available in the market. ERP can be viewed as a vital strategic tool in integrating all primary business functions in order to achieve higher operational efficiency. It also allows adopted companies to manage vast amounts of complex data into one centralised system (Yen & Su, 1997). However, the deployment of on-premise ERP is a highly expensive and time-consuming process and entails a significant amount of business process reengineering and uncertainty (Tsai et al., 2010). Hence this ERP package is not feasible for SMEs due to its scale of operation
and cost factor. To solve these problems, SMEs can take advantage of the emerging Internet-based service model called cloud-based ERP. This technology is an affordable and viable option for the SMEs as they can outsource its development, maintenance and up-gradation related activities to a third-party vendor.

Cloud ERP is particularly suitable for SMEs as it does not require any upfront cost or specialised IT, staff, for maintenance and up-gradation like on-premise ERP system. The supply chain partners can effectively utilise cloud ERP by getting access to a synchronised database – where they can process and manipulate data according to their varying needs and flexibility. The adoption decision of any technological innovation generally depends on the evaluation of its perceived benefits and challenges (Flick, 2009; Lease, 2005; Salleh et al., 2012). A limited number of studies have been conducted to find out the potential benefits of cloud ERP adoption from the context of a developing country. Since business organisations of emerging economies operate in a different business setting, the potential benefits and challenges identified in the literature for developed countries might not be applicable in the context of developing countries. This study aims to explore and compare the benefits and challenges of on-premise ERP and cloud-based ERP. Then this study discusses the rationale of cloud ERP adoption among SME in the context of developing countries like Bangladesh.

3. LITERATURE REVIEW

Cloud computing has become a central area for IT investment and innovation in recent times, because of its demand-driven design, timely implementation and maintenance issues. The most popular definition of cloud computing has been provided by NIST\(^1\) which describes cloud computing as “a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g. networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction” (Mell & Grance, 2011, p. 2). New technology has emerged recently known as ‘Cloud computing’ which ensures a high level of scalability, efficiency and flexibility using on-demand delivery of computing, storage and applications over the Internet from centralised data centres (Lin et al., 2009). NIST proposed a layered cloud computing model comprising of three services and four deployment models (Mell & Grance, 2011; Vaquero et al., 2008; Iyer & Henderson, 2010; Buyya et al., 2009). First of all, three service models (shown in Figure 1) are described briefly in the following paragraphs:

**Infrastructure-as-a-Service (IaaS)**: In this model, IT infrastructure such as virtual servers, processors, storage, connectivity domains, system software (e.g., Citrix Cloud Center, Amazon EC2) are delivered and maintained by the service providers using cloud computing technology, customised according to the client organization’s requirements and charged based on their usage (Garrison et al., 2012; Mell & Grance, 2011).

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\(^1\)The National Institute of Standards and Technology (NIST) is a physical sciences laboratory and a non-regulatory agency of the United States Department of Commerce. Its mission is to promote innovation and industrial competitiveness.
Platform-as-a-Service (PaaS) : In this platform, various sophisticated software packages (e.g. programming languages and tools) are delivered by the service providers which can be utilized by the developers to design and develop new services and web applications such as Force.com, Google Apps, by completely residing on the online Internet platform (Garrison et al., 2012; Iyer & Henderson, 2010).

Software-as-a-Service (SaaS) : In this model, different kind of software applications are delivered over the Internet to the consumers without requiring any actual on-premise installation and implementation Issues. The adopting organisation can access the desired application through a thin client called a web browser. The cloud service providers are fully responsible for the up-gradation and maintenance of the software packages (Garrison et al., 2012). The deployment models are described in the following paragraphs.

![Cloud Computing Service Models](image)

Public Cloud : In this platform, the infrastructures and services are made available in a shared-based public domain accessible by any customer through Internet, usually managed and owned by a cloud service provider such as Amazon EC2 (Garrison et al., 2012; Mell & Grance, 2011).

Private Cloud : In this model, cloud services are dedicated solely to an organisation. The services may reside on-premise or off-premise, managed by the adopting organisation or a third party. Typically, companies implement private cloud to resolve the problem of lack of IT maturity and security concerns associated with the public cloud (Chang et al., 2013; Mell & Grance, 2011).

Community Cloud : In this platform, the community cloud be managed either by a participating company or a third-party responsible for delivering cloud services to several organisations belonging to the same community with shared concerns. (Mell & Grance, 2011; Iyer & Henderson, 2010).

Hybrid Cloud : In this platform, the hybrid cloud is a configuration of two or more clouds which retain distinctive entities but are bound by standardised or patented technology that allows data and application portability (Jansen & Grance, 2011). This approach is suitable for organisations wanting to reduce costs while maintaining privacy and data security.
Recently, some well-known ERP vendors (such as SAP, Oracle Applications, Microsoft Dynamics, IBM) started to develop and offer cloud-based ERP services to deal with the increasing demand for flexible and web-based integrated platforms. A survey conducted by Gartner in 2010 revealed that 99% of the respondents wanted to continue their investment in cloud solutions for collaborative supply chain management and 72% wanted to increase their investment (Gartner, 2010). These statistics suggest that the market for cloud-based ERP is expanding for both large organisations and SMEs (Seethamraju, 2013).

3.1 Potential Benefits of Cloud ERP Adoption

Cloud Computing and ERP have been defined as a joint system by Kiadehi and Mohammadi (2012), where an organisation uses an ERP system hosted by a cloud service provider. The adoption decision of any technological innovation generally depends on the evaluation of its perceived benefits and challenges (Flick, 2009; Lease, 2005; Salleh et al., 2012). The well-known service providers are promoting the potential benefits of the cloud-based ERP systems as they already have heavily invested in the cloud infrastructure. However, enterprise users are not still confident to move their on-premise ERP system on the cloud (Saeed et al., 2011). A survey conducted by Aberdeen Group (2011) also confirmed that on-premise ERP as the dominating deployment method for ERP implementation. It appears that companies are still cautious in Cloud ERP adoption (Stone & Vance, 2010).

The advantages gained from the cloud ERP adoption over on-premise ERP motivate the companies to switch their enterprise system to cloud. Some of the benefits are low initial costs (Saini et al., 2011), increased level of standardisation (Beaubouef, 2011), improved flexibility for business innovation (Marston et al., 2011). Saeed et al. (2011) have identified lower implementation costs, ease of use, extensibility and ability to focus on core business activities, as the main motivating factors for cloud ERP adoption. Some scholars suggested that cloud ERP potentially is suitable for start-up companies and SMEs because of the option to share dynamic resources offered by cloud services (Marston et al., 2011; Habib et al., 2010; Saeed et al., 2011). Moreover, cloud ERP is highly portable in nature which allows employees to access the web-based system from anywhere (Saeed et al., 2011; Makkar & Meenakshi, 2012). It also requires less implementation time since ERP system has already been deployed on cloud and networked among modules which are ready to use (Makkar & Meenakshi, 2012). The adopting organisations only need to conduct some basic reconfigurations according to the requirements of the ERP software, which makes the solutions less complicated compared to the traditional ERP system. Implementation of cloud ERP solution usually takes only a few weeks as compared to several months for on-premise ERP solution (Makkar & Meenakshi, 2012). This promptness of cloud ERP can add value to SMEs by reducing the time to market their products and service (Saeed et al., 2011).

In cloud ERP, there is also no need to hire expensive external consultants since the provider takes the responsibility of managing, maintaining and upgrading the ERP
system along with security issues. According to Link (2013), cloud-based ERP is a better choice when the IT know-how is limited at the organisational level. Moreover, the cloud vendors not only ensure high reliability by means of back up servers but also automatically upgrade the ERP system with the most up-to-date versions which are considered as one of the primary motives behind cloud ERP adoption (Saeed et al., 2011; Link, 2013; Makkar & Meenakshi, 2012). The compatibility among the versions is viewed as a significant concern in on-premise ERP implementation since typically after five years, the existing ERP system becomes out-dated and the company need to replace it with a newly revised system, incurring very high costs (Sontow & Kleinert, 2010; Link, 2013). Furthermore, the cloud vendors provide higher technical security than in-house IT department because of the shared resources offered by cloud computing (Marston et al., 2011; Habib et al., 2010).

Deployment of cloud ERP could not only reduce the capital expenditure on hardware and license cost but also reduce the ownership cost, upfront cost as well as maintenance cost (Castellina, 2011; Lenart, 2011) whereas, traditional ERP systems require substantial up-front investment for purchasing and upgrading the in-house ERP system for the first couple of years (Saeed et al., 2011). Cloud ERP is considered as like other utility services as the fee is charged based on usage (Salleh et al., 2012).

Cloud ERP ensured scalability on-demand because of virtual machines, storage and computed cycles are shared by users (Marston et al., 2011; Habib et al., 2010; Gartner, 2010; Makkar & Meenakshi, 2012). However, traditional ERP systems require months to increase scalability as enterprises need to buy new servers, software and licenses (Saeed et al., 2011). Migration to the cloud should automatically eliminate all the license management issues and give the advantages of virtualisation, which will increase the communication capability of the organisations to their supply chain partners (Guse, 2012). This will increase not only the transparency among the supply chain partners but also the intra-organizational accountability. In terms of environmental issues, cloud ERP model proved to be favourable as the carbon footprint from the entire IT section is detached from the firm’s premise (Beaubouef, 2011).

3.2 Challenges behind Cloud ERP Adoption

IDC\(^2\) names security, performance, availability, integration with in-house IT and the difficulty of customisation as some challenges to Cloud Computing (Dillon et al., 2010). Researchers have commonly agreed that security, flexibility, customisation, ownership of data, the integrity of the provider and ability to switch to another cloud service provider represents main challenges to the cloud ERP adopters (Castellina, 2011; Lenart, 2011). Although cloud ERP offers a significant reduction on cost, some organisations find it pointless to abandon their existing in-house ERP system since they already invested enormously in the project in terms of training, licensing and external consultations. Moreover, there will be some trade-offs associated with switching, which might hamper the current business activities and operational

\(^2\)International Data Corporation (IDC) is the premier global provider of market intelligence, advisory services, and events for the information technology, telecommunications, and consumer technology markets.
performance (Saeed et al., 2011). Besides, top management’s attitude toward the adoption of cloud ERP plays a critical role in switching to cloud ERP systems (Mehrtens et al., 2001). If the top management is not convinced enough in replacing the on-premises ERP where they invested a lot, it could be viewed as a significant obstacle in the way of cloud ERP adoption.

Companies prefer the cloud ERP service providers to be within their own country, i.e. within the same legislative system (McCabe & Hancock, 2009) to ensure a stable environment (Schubert & Adisa, 2011) regarding data storage, security and privacy (Kim, 2009). Since enterprises are not aware of the data location in the cloud, which might be anywhere outside of the country, it may cause legal problems or dishonour of the government regulations. Therefore, it acts as one of the prime barriers of cloud ERP adoption (Saeed et al., 2011; Appandairajan et al., 2012). Interoperability between different cloud vendors poses another challenge since there exist no long-term commitments with the vendors (Schubert & Adisa, 2011). As the enterprises lose control of their infrastructure and platforms, they might find themselves reluctantly locked-in and exposed to high switching costs in case of data migration to another vendor (Lenart, 2011; Schubert & Adisa, 2011).

Anandasivam et al.’s (2010) study investigated the difficulties faced by cloud services providers in pricing the infrastructure based on the on-demand resource utilisation. Several pricing models have been suggested by the researchers to define the process of how to effectively price IT services (Hedwig et al., 2010). For example, price models based on a fixed/variable (Wu & Banker 2010), negotiating (Choudhary, 2007), SLA related ones (Buyya et al., 2009) or Pay-as-you-go (Armbrust et al., 2010). However, it remains a challenging area for Cloud ERP adoption. Hidden costs are an old problem of the IT industry, and they depend on an enterprise’s negotiation skills and experience with previous contracts (Saeed et al., 2011). IDC survey ranked the hidden cost (for example, storage systems, employee training, network equipment) associated with the cloud ERP as one of the unique challenges (Dillon et al., 2010) as each one has its financial implications in deciding migration to the cloud (Guşçe, 2012).

Integration is a known problematic issue both in cloud-based and on-premise ERP adoption (Kamhawi, 2008; Kim, 2009). Enterprises might purchase various functional modules from different cloud providers who may reside in both public and private cloud. Since the environment in the cloud is strict, and the consumers have little control over the infrastructure and applications, integration process becomes much more difficult. The customisation is another major problem of cloud ERP as the system is based on a multi-tenant architecture where multiple users share computing resource (Makkar & Meenakshi, 2012; Saeed et al., 2011).

The outage of service is another prime issue of cloud ERP mentioned by several scholars (Kim, 2009; Dillon et al., 2010). Cloud ERP is typically installed at provider’s server at a distant location and access to this database requires seamless internet connectivity (Bin-Motalab & Shohag, 2011) and therefore any type of temporary
or permanent inaccessibility of the cloud server or outage of service can become a disaster for an enterprise. Internet bandwidth to support cloud ERP is also viewed as a critical factor for successful adoption (Saeed et al., 2011).

4. CLOUD ERP ADOPTION BY SMES

While the developed world is far ahead in adopting IT solutions for their businesses, the organisations in the emerging economy are still struggling to keep pace with these new advanced technologies. Ignorance of the usefulness of technology has also been identified as a factor leading to a lower rate of technology adoption in developing countries. The slow uptake of IT adoption by SMEs in developing countries can be attributed to unique challenges they face in terms of availability of the infrastructure, lack of technological readiness and inherent cost associated with such adoption (Rahayu & Day, 2015). An effective IT system enables organisations to control all their functional units seamlessly using integration, automation and customisation, resulting in increased flexibility, accountability and productivity (Laudon & Laudon, 2004). Some large companies have started utilising IT system; nevertheless, the penetration of IT system among SMEs is much below its potential in developing nations. Barely any SME in Bangladesh has devoted any significant effort to improve its business process integration using IT. The situation is not also very much optimistic for even large companies. It is said that a company with annual revenue higher than US$ 5m cannot operate efficiently without an integrated IT system (Yen & Su, 1997). There are several large companies in Bangladesh with an annual turnover of more than US$ 100m and maybe over 100 companies with US$ 50m. However, even these big companies are not using fully integrated IT system.

SME owners are extremely concerned about their return on investments, so they are usually reluctant to make substantial investments in IT since short-term returns are not guaranteed. Some other obstacles include a lack of human resources and security issues. A study conducted by Faisal (2011) has also identified unawareness and expertise in information technologies as significant challenges among Pakistani SMEs. As compared to their large companies, SMEs incline to have inadequate resources in terms of time, money and expertise (Cragg & King, 1993; Wymer & Regan, 2005). In light of that, cloud ERP appears as an attractive option to SME in solving the problems of high investments in IT resources and infrastructures (Beaubouef, 2011; Sultan, 2011). Cloud computing-based technology promises to deliver tangible business benefits for SMEs in much lower cost as they only have to pay for the required operational modules, offering a good return on investment of their limited resources (Alshamaila & Papagiannidis, 2012). Sultan (2010) argues that cloud computing is prospectively to prove commercially viable for many SMEs due to its flexibility and pay-as-you-go cost structure.

Some researchers examined the inhibitors (Truong & Dustdar, 2011) and enablers (Dwivedi & Mustafee, 2010) behind the implementation of cloud computing by SMEs, in conjunction with the long term sustainable competitive advantages of such adoption (Truong & Dustdar, 2011). Alshamaila and Papagiannidis’s (2012) study
contributed to the increasing body of research on cloud computing by studying SME adoption process in England using qualitative exploratory study. The main motives behind the SMEs’ adoption of cloud services were: relative advantage, uncertainty, geo-restrictions, compatibility, size, top management support, trialability, prior experience, innovativeness, industry, market scope, supplier efforts and external computing support. Cloud-based ERP may be the best option to help the SMEs to overcome their out-dated IT capability constraints by offering ease of access to global innovations and scalability at a reduced cost (Seethamraju, 2013). Implementing an ERP system not only would contribute to automation but also improve the visibility of information about resource usage in real-time throughout the organisational value chain. Further, ERP offers more significant insights into more improvements in organisational structure, responsibilities and decision-making processes (Seethamraju, 2013). By utilizing the cloud-based services, SMEs can have access to full-fledged ERP systems without the need of their individual IT department or to hire an expensive IT consultant (Sharif, 2010; Salleh et al., 2012).

Despite the suitability offered by the cloud services for start-up and SMEs, it is surprising that many researchers on cloud computing focus on the potential of big companies ignoring the possibilities in the SMEs (e.g. Linthicum, 2010; Iyer & Henderson 2010; Babcock, 2010). However, the cloud ERP market for SMEs is gradually evolving as top vendors have started to observe the potential benefits of the market. Abderdeen Group conducted an ERP survey in 2011, which depicted a low adoption rate of cloud ERP of about 9% (Castellina, 2011). Regardless of its low adoption rate (Lenart, 2011; Saeed et al., 2011), the SaaS model is gaining ground and has grown steadily amongst SMEs.

Seethamraju (2013) examines the influencing factors, benefits and challenges behind SaaS ERP adoption by SMEs using a cross-sectional field study conducted on four case organisations and software vendors. According to their study, the low cost of ownership, low initial investment costs, the potential enthusiasm of the vendors to participate in co-creation of value for customers, and general advantages of implementing an integrated ERP system are primary determinants of SaaS ERP adoption decisions by SMEs. External factors, competitive pressures faced by the enterprise, and concerns on the security and integrity of data do not influence adoption decision, according to their study (Seethamraju, 2013). Recently, the developing world’s cloud computing sector has received considerable attention from global IT service providers and governments. While IBM established cloud computing centres in China, India, Vietnam and Brazil (Kshetri, 2010), Ethiopian government deployed cloud computing technology to remotely manage 250,000 laptops with teachers throughout the country (Marston et al., 2011). Other global cloud players such as Microsoft, VMware, Salesforce, Dell, and Parallels are also vigorously searching for prospects in the developing world.

As pointed out by Carr (2005), SMEs have much less of the ‘attitudinal’ issues to deal with in moving towards SaaS environments than larger enterprises. Thus,
implementation of SaaS ERP system could be less complicated and faster in an SME’s context, thereby saving much indirect implementation and change management costs to SMEs (Seethamraju, 2013). SaaS-based solutions could make employees discover novel and innovative ways of using the technology which facilitate better collaboration amongst employees which make employees more productive (McAfee, 2011). Further, SaaS ERP may also decrease their need for technical IT capabilities (DeSisto, 2010; Seethamraju 2013).

The advantages of cloud computing might be more evident for developing countries as they often have limited ability to access resources and need more time to adopt a robust IT infrastructure (Greengard, 2010). With the help of cloud technology, developing economies could catch up with developed countries as it gives them access to the same IT infrastructure, data centres, and applications at an arguably reduced price while ensuring a level playing field even for SMEs (Kshetri, 2010). Veigas et al. (2012) discussed the tremendous opportunities and challenges in the area of cloud computing and the impact of such adoption in the emerging economies. They reported that rise in GDP, the achievement of business agility, generation of job and reduction of software piracy are the possible impacts of cloud computing adoption in developing countries. Increased operational efficiency, enhanced security, development of new product line, spreading the business in the global market and export of cloud services are possible influences of cloud adoption in the emerging economy according to the study of Kshetri (2010).

5. UNDERSTANDING THE POTENTIALS BEHIND CLOUD ERP ADOPTION BY BANGLADESHI SMES

SMEs play an essential role as the backbone of the economy, especially in a populated country like Bangladesh. Bangladeshi SMEs can generate mass employment by engaging people with limited skills and resources. In the present scenario, Bangladeshi SMEs have helped many people to earn a living and come out of poverty. Thus, Bangladeshi SMEs not only contribute positively to its economic growth but also improving the standard of living. In the case of Bangladesh, SMEs contribute 35.49% of the total employment of the country (The Daily Star, 2019). The increasing liberalisation and fierce competition of the world economy have pressurised the SMEs to continually search for ways to improve their competitive ability (Chong & Lin, 2008; Lucchetti & Sterlacchini, 2001). To tackle the intense waves of globalisation in the 21st century, adoption of modern Information Technology (IT) is believed to be the utmost cost-efficient tool in reinvigorating SMEs to spread their business quickly and successfully to any highly decentralised network (Gibbs & Kraemer, 2004).

In recent times, rapid exponential growth in both Internet and mobile phone infrastructures in Bangladesh provides a very conducive environment for cloud-based ERP adoption by SMEs. The availability and affordability of the Internet, a dramatic drop in the bandwidth costs and other technological advancements (4G, FTTH, and WiMAX) have contributed to the emergence of cloud computing and cloud ERP in Bangladesh (Grabski et al., 2011; Mohamed, 2009; Alali & Yeh, 2012).
Recently, the Bangladeshi SMEs have started to utilise cloud-based services but not fully aware of the potential benefits associated with it (Mazumdar & Alharahsheh, 2019).

Various studies guaranteed numerous prospective benefits associated with cloud-based ERP adoption, especially for SMEs (Oliveira & Martins, 2010; Adam & Musah, 2014; Mazumdar & Alharahsheh, 2019). Cost-effectiveness (no upfront cost, maintenance cost, license cost), efficient use of the up-to-date modern technology without requiring any technological skills (i.e. SaaS), fewer maintenance requirements, usage of shared clouds and necessity of insignificant infrastructural changes (i.e. IaaS) could be the main potential benefits of cloud ERP adoption among Bangladeshi SMEs. Bangladeshi SMEs can take full advantage of various modern ERP packages which are actually installed in the cloud using their mobile devices through the internet. The parent companies can monitor the progress of their order and communicate with their supply chain partners (i.e. SMEs) by using a public or private cloud-based ERP which will help them to become more agile, innovative and competitive. On-time delivery is one of the crucial criteria to survive in a highly intense international market. SMEs can maintain their inventory, process their order and communicate with their supply chain partners by using the Cloud-based ERP. Although there exist problems like outage of services, difficulty in vendor migration and security issues but these problems can be easily solved by proper vendor relationship as well as using advanced technologies.

6. CONCLUSION

Cloud ERP is an emerging phenomenon, and its market is not mature enough in several parts of the world, especially in developing countries. Given the present socio-economic scenario and technological readiness of Bangladesh, there exists a proper scope for cloud ERP adoption by Bangladeshi SMEs. However, the adoption has not been high among small and medium enterprises as there exists a lack of awareness among SMEs about the potential benefits and challenges of adopting the cloud-based technology (Mehrtens et al., 2001). This paper, based on a comprehensive literature review, discusses the benefits and challenges of cloud ERP adoption by SMEs and then contextualizes it to the context of Bangladesh. This discussion can be used by SMEs as a decision point for adopting cloud ERP as an important option for improving their operational efficiency. Bangladeshi SMEs can concentrate on their core activities while outsourcing the entire technology-related supporting processes to a third-party vendor without incurring much expense. Future studies may conduct on an extensive scale survey to empirically investigate this phenomenon to provide a high-quality evidence base upon which service providers and consultants can design and implement a cloud-based ERP system most effectively, especially for the SMEs of the emerging economies.
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