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Review of Research on Benefits and Challenges Associated with Cloud ERP in SMEs

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Abstract

Recently, due to the presence of the fourth industrial revolution and the presence of the digital era, a considerable debate has been established among economists about the emergence of digitalization and its effect on a company's performance. One of the most common tools utilized in modern enterprises is the ERP system. Recently, due to the presence of cloud computing, the emergence of cloud ERP made a significant change in the number of enterprises which be able to utilize the ERP system due to several reasons, but the main reason is less costs compared to the utilization of traditional ERP.

In Large Enterprises (LEs) the utilization and costs of using traditional ERP systems was not considered an issue, due to the availability of financial and technical resources but on contrary, for Small and Medium Enterprises (SMEs) the utilization of ERP system is considered a financially and technically as a challenge, which wastes many chances of growth. While it's worth mentioning that SMEs are acknowledged for having significantly influenced socio-economic growth, moreover, SMEs gain recognition due to their contributions to the nation's and its programs' sustainable development.

The main objectives of this thesis are to present the general benefits and challenges of utilizing cloud ERP in general while focusing more on the challenges associated with the utilization of cloud ERP in SMEs in general throughout the main four phases of project execution, which are the project chartering phase, the project phase, the shakedown phase, and finally the onward and upward phase. The findings of this thesis can be used as a guide for the SMEs which have the intention to utilize cloud ERP to maximize their benefits and reduce utilization costs.

Language: English
Key Words: ERP, Cloud ERP, SMEs

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1 Introduction

Recently, due to the presence of the fourth industrial revolution and the presence of the digital era, a considerable debate has been established among economists about the emergence of digitalization and its effect on a company's performance. Some advocate that digitalization has a significant contribution to achieving major performance, arguing that all businesses are moving toward digitalization. On the other hand, others dispute that it is a secondary element for increasing overall performance and has many associated challenges to be achieved, not the major one, justifying that with different results obtained from ongoing business. In this thesis, one of the most important digitalization tools will be presented and discussed, which is Enterprise Resource Planning (ERP) systems.

The main purpose of this thesis is to understand the current situation for the utilization of cloud ERP in general and in Small and medium-sized businesses (SMEs) in particular. The focus on SMEs as it has been acknowledged for having significantly influenced socio-economic growth, in addition to that, SMEs gain recognition due to their contributions to the nation's and its programs' sustainable development (Haji Salum & Abd Rozan, 2016). So, it is important to study how to utilization of new digitalization tools can improve the performance of SMEs, as it plays a vital role in increasing the growth of developing countries. So, due to the importance of SMEs, the main focus of this thesis will be on the challenges and benefits of utilizing cloud ERP systems in SMEs.

Many organizations do not realize the impact of digitalization on performance and they use information and communication technology without a plan, as a result, many CEOs seek to find a way to realize how digitalization affects their business (Björkdahl, 2020). So, it is important to

develop a method to measure the effect of utilizing the new emerging digitalization tools on different kind of business, in order to obtain a full overview of the effect of the digitalization and its importance (Grubic & Jennions, 2018). So as a result, businesses that invest in digitalization might beat their competitors in terms of sales growth and operational effectiveness (Stanley & K. Gyimesi, 2015). According to the research made by Baines et al., (2017) to expand prospects and advantages, many firms are driven to create novel business models that rely on digital technology.

There are plenty of definitions for digitalization, for instance the most common one is presented by Gartner Glossary, (2023) which defined it as the transition to a digital business; where the use of digital technologies alters the business model and offers new revenue and value-producing options. This definition claims that, despite the obvious connections between all of these ideas, digitalization is more about commercial processes than social interactions or business models (Jason Bloomberg, 2018). Yet, digitalization and digital transformation are very different. A company may embark on a number of digitalization initiatives, from automating procedures to retraining staff members to utilize computers. On the other hand, businesses cannot conduct digital transformation as projects. Instead, this more general word refers to the customer-driven strategic business transformation that calls for both the adoption of digital technologies and organizational changes that cut across all departments. Some, executives who think that there is nothing more to digital transformation than digitalization are making a critical strategic error. Digital transformation initiatives will often involve a number of digitalization projects.

In actuality, as the business becomes entirely customer-driven, digital transformation necessitates improving how well the firm manages change overall. While it should not be confused with ongoing digitalization activities, such agility will help them. In general, we digitize information, we digitalize the roles and procedures that make up an organization's operations, and we transform an organization's operations and strategy using digital technology. Most crucially, digitization and digitalization are mostly about technology, whereas digital transformation is not (Jason Bloomberg, 2018). As shown in Figure 1, Parviainen et al., (2022) summarized the impact of digitalization into three elements, which are disruptive change, internal eficiency, and external opportunities. Balić et al., (2022) stated that ERP systems have become an essential element in modern business integration and provide only one data entry principle, which leads to improving the resources eficiency process and capabilities, and for sure business performance.

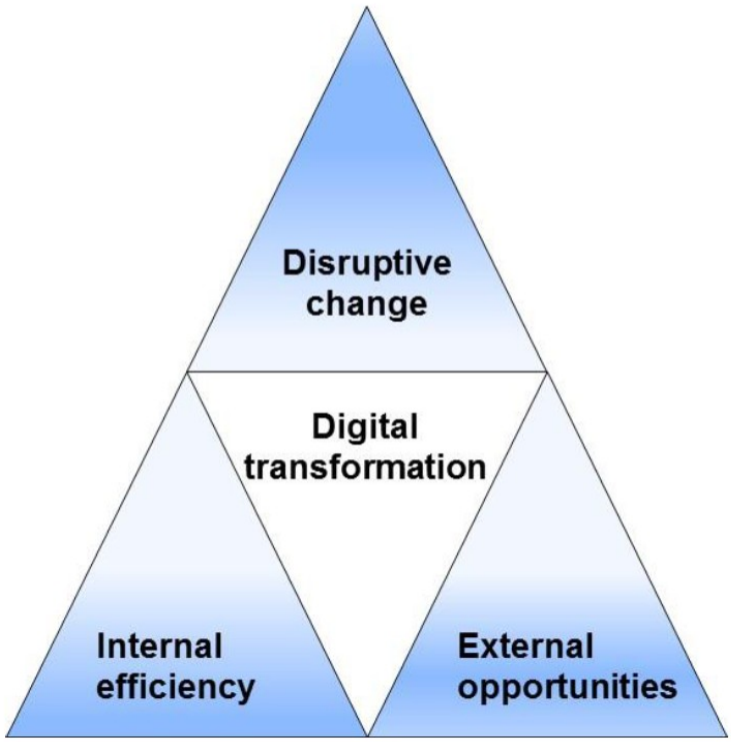

Figure 1. The impact of digitalization (Parviainen et al., 2022).

1.1 Background

There are several definitions for ERP, but Balić et al., (2022) defined it as a "Computer program package that helps the improvement and integration of businesses management procedures". Also, it can be defined as a "configurable information systems package that provides seamless integration of information and information-based business processes within and across functional areas in an organization" (Kumar & van Hillegersberg, 2000). Finally, Bjelland & Haddara, (2018) defined it as "a cross-functional and enterprise-wide system operating through a bundle of integrated modules that support the standard business processes of an organization", which consists of standard functions that could help the standard business processes of an organization.

ERP system is an integrated system, which integrates and collects all the data and information from several departments within an organization into one database and single system providing the once-only concept (Balić et al., 2022). By incorporating data and cross-functional activities into the system, one of the key objectives of an ERP system is to support the company's core processes and routine transactions (Kotb et al., 2011). Adopting an ERP system is often driven by the need to reduce costs, enhance customer connections, enhance decision-making through greater reporting capabilities, adhere to market and legal requirements, and improve process eficiency (Elragal & Haddara, 2012). Even though ERP systems have been introduced and utilized several years ago in large corporates through over the world, however, most medium and small corporates, especially in developing countries, lag (Galy & Sauceda, 2014).

Organizations have different variable resources, but the collected data and information throughout different operations are considered the most valuable resources (Dubey et al., 2020). Collecting and storing the data from different departments inside the organization is not enough to ensure high performance, but also timeliness and accuracy play a vital role in the organization's success (Barna et al., 2021). Recently, due to the emergence of new challenges such as the Covid-19 pandemic, the market of ERP tends toward a positive trend (Zerbino et al., 2021). ERP systems contain different modularity, which differs from corporate to another based on the nature of corporate operations, such as human resources, sales, finance, and procurement (Barna et al., 2021).

Several business management activities can be optimized and integrated by utilizing ERP systems by enabling central repositories and standard business rules for all business domains (Ouiddad et al., 2021). According to Raoof et al., (2021), ERP systems play a vital transformation role in enhancing the corporate's productivity and eficiency. The usage of ERP systems provides several merits such as increasing productivity (Beheshti & Beheshti, 2010), enhancing the quality of decision-making (Ouiddad et al., 2021), increasing revenue while reducing the running cost, and improving the corporate market value (Yang & Su, 2009), and last but not least, enhancing the eficiency of corporates supply chains by providing a transparent flow of information inside the corporates ecosystem (Ruivo et al., 2020).

Ruivo et al., (2020) introduced literature showing the ERP capabilities' direct effect on corporate performance and its direct effect on other origination capabilities. By aligning the ERP systems with the organization's strategic needs, the business performance can be enhanced significantly (Velcu, 2007). ERP systems integrate functions and processes, which provide a more

eficient flowless, and much more transparent way to conduct business (Al-Dhaafri & Alosani, 2021).

Lorenc & Szkoda, (2015) stated that the utilization of ERP systems provides a significant cost saving in terms of time and money by doing repetitive tasks automatically, which leads to the relocation of different laborers and resources between tasks and jobs. The presence and utilization of an ERP integration system provide a better inventory monitoring and planning system, which in general reduces procurement, general and administrative costs (Fernandez et al., 2017). Nicolaou & Bhattacharya, (2006) mentioned that better resource management and financial planning can be achieved by the utilization of an ERP integration system.

Recently, due to the emergence of different IT software and its integration with the modern economy for corporates, a direct relationship between the usage of these new tools and business performance has existed. Plenty of studies have shown the direct relationship between the corporate's performance and the utilization and merging of business with new IT software. Alghorbany et al., (2022) provided a study, which proves the direct relationship between the company's performance and IT utilization. That study introduced data collected from 231 companies from 2010 to 2019 in Malaysia, showing the incurred investment in IT has a positive but weak effect on the company's performance.

The importance of that study and the collected data can act as valuable sources for prospected investors and stakeholders. Moreover, it will help future studies to identify the crucial elements for future IT investment. Another study presented by Velcu, (2007), shows the effect of utilizing IT software on business processes like customer service, inventory turnover, and turnover ratios.

The relationship between the utilization of ERP and corporate performance has provided a long debate among practitioners and theorists to answer the question of how much a company can invest to achieve the cost-effectiveness equation. A study made by Elsayed et al., (2021), presented a significant effect on an organization's performance, while another study introduced by Jayeola et al., (2022), showed a minor impact on an organization's performance. So, Balić et al., (2022) presented a study determining the relationship between organizations' performance and ERP quality. The study indicated how far the organization can invest in ERP systems to achieve a positive impact in financial and non-financial aspects.

While it is worth mentioning that the utilization of ERP systems has three main considerations such as ERP information quality, ERP system quality, and ERP service quality. Ouiddad et al., (2021) defined ERP information quality as "The data responsive to the user's requirements and needs", while ERP system quality introduces the processing quality of information and system capacity. Finally, ERP software service quality shows the relationship between service performance and clients' expectations, while being assisted by a technical information system (Hsu et al., 2015).

1.2 Research problem and significance

The main purpose of this research is to understand the current situation for the utilization of cloud ERP in general and in Small and medium-sized businesses (SMEs) in particular. SMEs are acknowledged for having significantly influenced socio-economic growth, moreover, SMEs gain recognition due to their contributions to the nation's and its programs' sustainable development (Haji Salum & Abd Rozan, 2016).

The right usage of Information and Communication Technologies (ICT) by SMEs could enhance their potential to compete with large enterprises in their business operation (Haji Salum & Abd Rozan, 2016). Popli & Sarin, (2015) stated that SMEs are acknowledged as the main revenue generators in any growing economy. With an ERP system, SMEs can manage their operations and data more effectively, as mentioned earlier, ERP is an integrated system that organizations use to enhance decision-making, enhance data management and procedures, streamline production, and provide interdepartmental capabilities, in addition to that, it is renowned for having a variety of beneficial features and capabilities to streamline business operations (Shahawai & Idrus, 2011).

The research question (RQ) in this master thesis is the following:

RQ: What are the Challenges Associated with Utilizing Cloud ERP in SMEs?!

1.3 The objective of the thesis and delimitations

The purpose of the thesis as presented earlier is to investigate the general benefits and challenges associated with the usage of Cloud ERP in general and a deep investigation into the limitation of the usage of cloud ERP in SMEs in particulate. The focus on SMEs is due to their importance toward socio-economic growth, moreover, SMEs gain recognition due to their contributions to the nation's and its programs' sustainable development. The presence of cloud ERP compared to the traditional ERP, allow more opportunities for SMEs to become able to utilize and benefit from the ERP capabilities. According to Julia Devos & Zishu Chen, (2022) there is evidence that SMEs contribute more than their fair part to the prosperity of their country. In addition to that, SMEs account for 90% of all businesses, 50% of employment globally, and up to 40% of GDP in emerging nations.

Several studies such as (Haji Salum & Abd Rozan, 2016), (Awan et al., 2021), (Haddara et al., 2022) have been checked and presented to indicate the challenges associated with the utilization of cloud ERP systems throughout four main project phases, which are the project chartering phase, the project phase, the shakedown phase, and finally the onward and upward phase. The goal of the thesis is to provide an overview of the most common challenges to have a better understanding of the utilization of cloud ERP in SMEs to maximize the benefits and reduce costs. This master thesis will be relevant and important the in similar situations. The challenges associated with the utilization of cloud ERP in Large Enterprises (LEs) will not be the focus of this thesis and it will be limited to SMEs.

1.4 Structure of the thesis

The master thesis consists of three chapters. We started with the introduction, background, and research problem and the significance, purpose, and delimitations of the study have been presented.

Chapter two will introduce the evolution of cloud ERP through different stages, the lifecycle framework of cloud ERP, and the general benefits and challenges associated with the utilization of cloud ERP systems.

Where chapter three a discussion on the adoption of cloud ERP in SMEs throughout the four main phases, which are the project chartering phase, the project phase, the shakedown phase, and finally the onward and upward phase will be discussed. In addition to that, a general discussion about the challenges faced with the execution of cloud ERP in SMEs will be presented.

Finally, in chapter four, a conclusion will be presented concluding the general findings and suggestions for future research.

2 Cloud ERP Evloution

2.1 ERP Evolution

ERP concept has been presented since the ’60s with different terms and functions, as shown in Figure 3, Verma et al., (2022) summarized the evolution of ERP from its first appearance in 60’x till the last used generation of ERP-III in 2020. In this chapter, all major generations and functions of ERP will be discussed and presented in brief. Generally, ERP concepts can be divided into five main categories during the last six decades. The first generation between 1960 and 1970 was Material Requirement Planning (MRP), which aim to predict material requirement. The second generation in the ’80s was MPR-II, which aims to manage manufacturing resources. The third generation in the ’90s was ERP, which aims to integrate the enterprise. The fourth generation in the 2000s was ERP-II, which aims to go beyond the enterprise. Finally, the fifth generation in 2010 and beyond is ERP-III, which utilized cloud computing technology.

2.1.1 MRP: Predicting Material Requirement (1960 – 1970)

The first development of MRP systems was in the 1960s to help in determining the number of components, parts, and materials required for product manufacturing (Alwabel et al., 2006). By utilizing the inventory data, bill of materials, and the master production schedule, MRP systems were able to calculate the parts or products required and determine the right time for the material replenishment order. The need for that kind of system arose in parallel with the increased complication in the production process, which engages several components in the production plants.

The main reasons for the adoption of the MRP system are the preservation of safety stock and a decrease in inventory cost. However, on the other

hand, the MRP system has shown some limitations, it provides a good result only if the production schedule is available and when the demand is predictable. So, the need for a more updated system with more functions is required to support the needs of the planning process. That opens the window for the development of the next generation of the MRP system, which is the MRP-II system.

2.1.2 MRP-II: Managing the Manufacturing Resources (the 1980s)

In the 1980s, the second generation of the MRP system (MRP-II) was presented with the main function of optimizing manufacturing processes. This was accomplished by timing the material handling with the demands of the manufacturing. Moreover, it involved several tasks such as production and financial systems and integrating new activities such as production planning, purchasing, production scheduling, distribution management, and shop floor management. Moreover, the MRP-II enabled short-term, intermediate, and long-range plans, which are possible to be modified based on the plant change requirement.

In addition to that, some MRP-II systems had simulation functions, which are capable of providing accurate predictions (Verma et al., 2022). Even though the MRP-II showed good results, it has many errors during implementation and it was not easy to be integrated seamlessly with all the organization's departments (Alwabel et al., 2006). So, the need for a seamless system arose for many organizations to overcome that issue and to integrate new departments and processes within the enterprise, which later on, resulted in the new generation of ERP systems.

2.1.3 ERP: Integrating the Enterprise (the 1990s)

The main aim of the new proposed ERP system in the early 1990s was to provide wide cross-functional coordination and integration within the enterprise. The main foundation of ERP was based on the previous generation of MRP and MRP-II, to provide real-time and tighter integration for the manufacturing process, moreover, ERP was capable of supporting a wide range of production strategies such as lean production methods and just-in-time techniques (Verma et al., 2022).

The new proposed ERP system was capable of integrating several sections such as human resources management, accounting, project management, financial department, maintenance schedules, and standard functions, which were originally provided by MRP-II (Davenport T. H., 1998). Rashid et al., (2002) summarized that the standard function consists of manufacturing, inventory management, transportation, and distribution, which aim to provide more consistency, visibility, and accessibility across the enterprise.

There are three main differences between ERP systems and their predecessors. First, the seamless integration of multiple organizational functions was a distinguishing trait of the ERP system (Davenport T. H., 1998). Relational database systems' development and ability to enable sophisticated database operations made this possible. ERP systems stored the data in a single relational database as opposed to several files. As a result, modifications performed by one function were immediately visible to other functions. Second, ERP systems allowed modular implementation, and it was architecturally distinct from the prior systems.

As a result, consumers could access various software features as distinct modules of a single ERP package, and businesses could decide whether to include or remove particular modules based on their needs (Verma et al.,

2022). Third, the workflow of the program, according to ERP suppliers, incorporates the best practices for the industry, this was supposed to give the business using the software a competitive edge (Davenport T. H., 1998). Later on, vendors started to provide new packages during the next decades to address other organizational responsibilities (Rashid et al., 2002).

2.1.4 ERP-II: Going beyond the Enterprise (the 2000s)

In the early 2000s, after the dot-com bubble collapse and the following consolidation of the vendors (Robert Jacobs & 'Ted' Weston, 2007), the need for a new ERP system and functions to be integrated into the ERP system become imperative, that encourage ERP designers to switch their attention on providing extra functions to their ERP systems, which later on will be known as ERP-II or extended ERP. During that phase, the focus was on new modules, which integrate external stakeholders such as suppliers and customers of the enterprise into the same working package to facilitate e-commerce (Alwabel et al., 2006).

As a result, modules like supply chain management and customer relationship management were created and integrated into ERP software (Verma et al., 2022). In addition to that, the second set of enhancements was developed to improve business operations by making better use of data stored in the ERP system by utilizing cuting-edge mathematics and decision-making approaches. So, as a result, new add-on modules have been integrated into the main ERP packages such as Business Intelligence.

2.1.5 ERP-III (2010 and Beyond)

In early 2010, a new proposed ERP system has been introduced utilizing cloud computing technology known as ERP-III (Saeed et al., 2012). By establishing a connection with the computer "cloud," which is typically

located on the vendor's website, cloud-based ERP offers service to its consumers. So, that avoids the need for costly hardware and software installation on the client's premises, and the cost of the client's infrastructure is greatly reduced (Verma et al., 2022). A more promising market for ERP suppliers is the global cloud-ERP market, which was valued at $13 million in 2016 and is anticipated to increase to $32 million by 2023, expanding annually at a rate of 13.6% from 2017 to 2023 (AMR, 2018). Therefore, it should come as no surprise that all significant on-premise ERP providers also provide cloud-based versions of their products, such as Oracle NetSuite, SAP HANA S/4, and Microsoft Dynamics 365 (Verma et al., 2022).

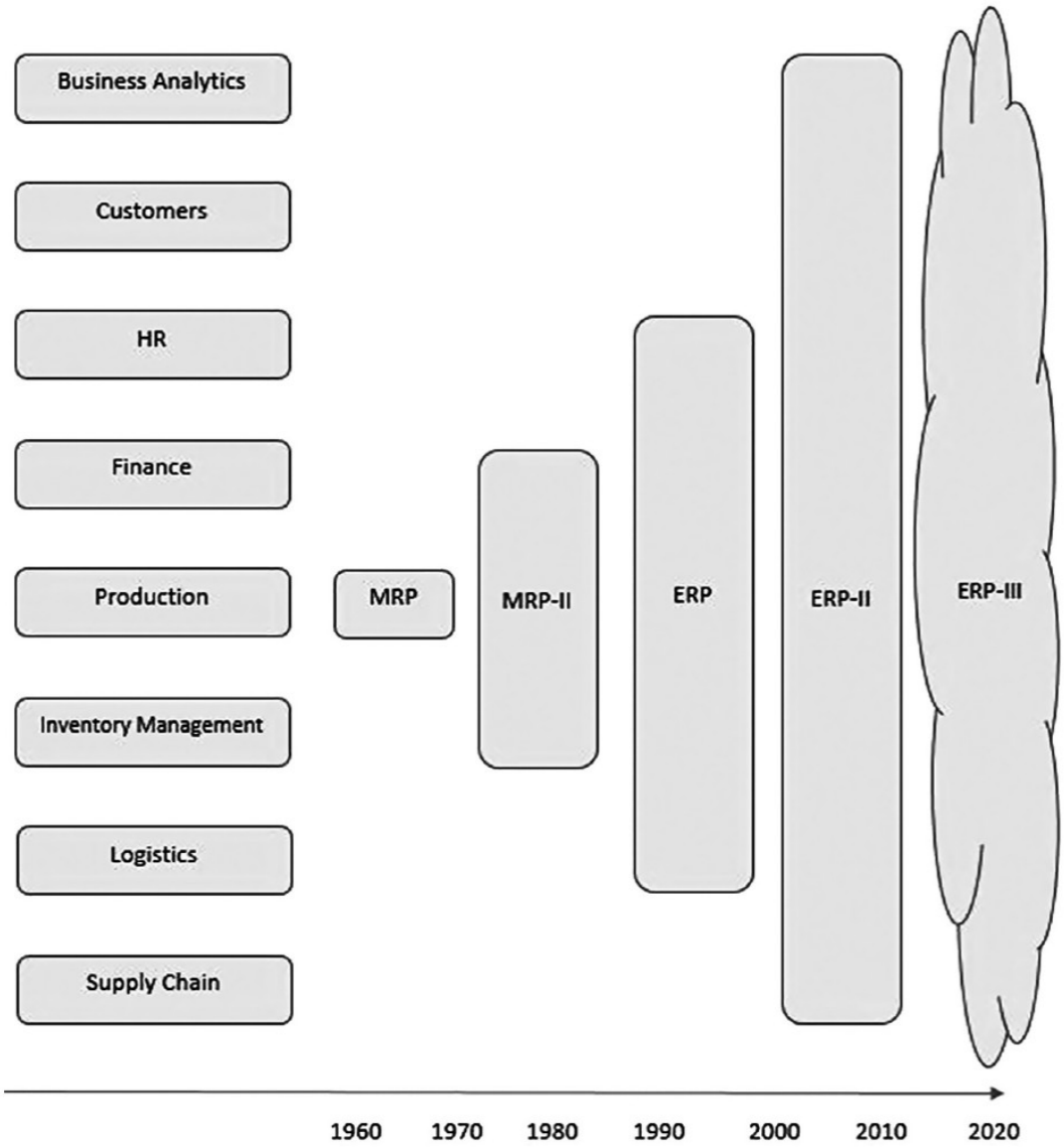

Figure 2. The Evolution of ERP Systems (Verma et al., 2022).

2.2 **Cloud ERP**

Recently, ERP systems can now be rented as hosted software using cloud computing (Haddara et al., 2015). First of all, we need to define what is cloud ERP As compared to an on-premises network ?!, according to Kendall Fisher, (2022) cloud ERP is an enterprise resource planning (ERP) system that enables enterprises to access through the internet. It runs on a vendor's cloud platform. ERP software helps with procurement, production, distribution, and fulfillment by integrating and automating key financial and

operational company processes. It also manages inventory, orders, and the supply chain. Businesses use the program online, so all they need is an internet connection and a browser.

High-speed internet networks connect several technologies that are used by cloud ERP systems. The cloud ERP is always online, and the ERP provider takes care of security upgrades. Your team only needs to worry about signing in and using the ERP and the data it contains. Compared to traditional ERP systems housed on company-owned servers, this could result in a reduced total cost of ownership. Users of desktop PCs or mobile devices can frequently access cloud ERPs. They come with a variety of business applications to keep your company running smoothly while puting an emphasis on a satisfying client experience and successful business outcomes. Cloud-based ERPs give your team near-infinite flexibility to scale and enable them to access whatever information they require from any location (Kendall Fisher, 2022).

Cloud ERP enables the vendors to give the customers access to a system, storage space, and hardware, and users can see almost everything that happens with the system and hardware, moreover, most ERP system implementations since the advent of cloud-based ERP systems have taken place in the cloud. (Duan, 2013). Haddara et al., (2015) stated that an ERP system is hosted at a vendor's location, which can be accessed online by enterprises using a cloud-based ERP system. Moreover, it is the vendor's responsibility to handle upgrades, maintenance, server management, and backups. The main components of the cloud ERP system are shown in Figure 2, which are: applications, servers, storage and networking, and in the core, databases.

For sure, the cloud ERP provider guarantees the dependability, safety, and system smooth operation on behalf of its client users. Adopting an ERP system is often driven by the need to enhance decision-making, reduce costs through greater reporting capabilities, adhere to market and legal requirements, enhance customer connections, and improve process eficiency (Elragal & Haddara, 2012). In addition to that, the introduction of the cloud service model allows the client the chance to share a variety of resources and obtain on-demand network access such as servers, networks, applications, data storage, and others (Duan, 2013).

According to Juell-Skielse & Enquist, (2012), the software as a service (SaaS) model is the most popular model of cloud-based ERP delivery model. The usage of SaaS minimizes the need for data centers and back-end hardware necessary to run the system, as well as the necessity to physically install and execute the server-side apps on the customer's premises (Armbrust et al., 2010), which makes it easy to support and maintain the application's operations. All aforementioned merits of cloud ERP, enable small and medium organizations to utilize ERP systems, while the presence of substantial resources or special skills is not needed for successful on-premise implementation (Haddara et al., 2015). According to Aberdeen Group, the adoption of cloud-based ERP systems will mostly continue to expand (Castellina, 2012).

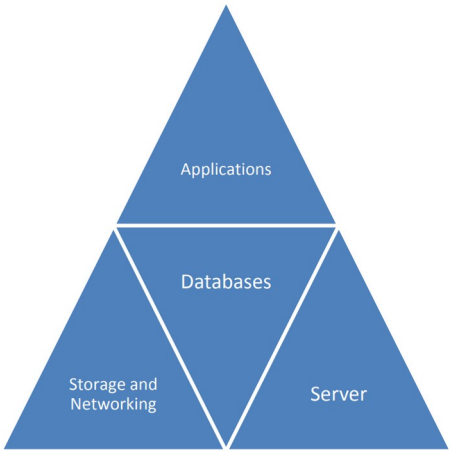

Figure 3. Cloud ERP components (Goel et al., 2011).

2.3 The ERP Lifecycle Framework

To have a deep understanding of ERP systems, it is important to recognize their lifecycle framework. The life cycle framework elements are very important to be acknowledged while utilizing ERP systems in SMEs, as these framework elements will affect the execution of the ERP systems in SMEs, studying those elements will give a wide and better understanding toward the challenges that might occur and might face the SMEs.

This section is a brief introduction to the ERP lifecycle framework including its main phases and dimensions. As illustrated in Figure 4, Bjelland & Haddara, (2018) presented a brief schematic showing all the phases and dimensions related to the ERP lifecycle framework from the start to the end. Esteves, (1999) stated that the ERP lifecycle framework consists of main six phases which are adoption decision, acquisition, implementation, use & maintenance, evolution, and finally retirement, which represents its life stages within any organization. In addition to that, it has four main dimensions, which are change management, people, process, and product, which are seen as viewpoints that can be used to analyze those phases.

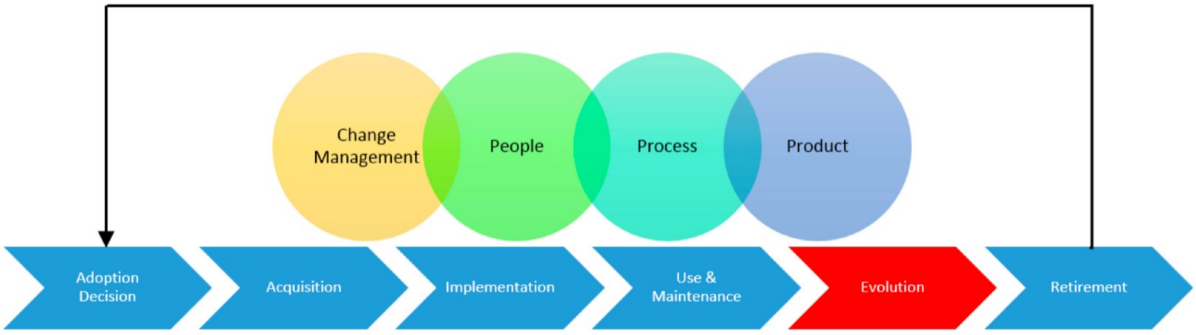

Figure 4. ERP Lifecycle framework **(Bjelland & Haddara, 2018)**.

2.3.1 **Product**

Any changes applied to the software or hardware during any updates will be related to the product. According to (Ng et al., 2003), there are no strict or determined standards or guidelines for ERP update and maintenance preparations. But on other hand, Calvert, (2006) stated that some ERP vendors upgrade their systems regularly. Overall, Bjelland & Haddara, (2018) collected and presented most of the issues related to the updating of Cloud ERP systems as follow: It is simpler to add new features, has cheaper expenses for IT employees and upkeep, updates are free, requires less upkeep, testing, setups, and customer planning. Also, cloud-based ERP vendors frequently release new versions, increasing their potential customer base while allowing users to concentrate on their core capabilities. Additionally, because they do not own the infrastructure or manage the applications, the organizations are not the true owners of the system. In addition to the fact that cloud-based ERP systems typically receive more regular upgrades and new functionality than on-premise ERP systems, the vendor also offers maintenance and helpdesk support.

2.3.2 **people**

The users of the system and how they develop their skills inside it are the focus of this part, which is frequently referred to as ERP training. If users possess excellent technical skills and a comprehensive understanding of the system, they can increase their success and competitiveness while lowering costs. To continually be more productive, the ERP system needs to be updated with intelligent features. Since the system's users—the people—need to learn how to use the new functions in order to benefit from them, ERP training may be crucial in this case (Bjelland & Haddara, 2018). Albadri & Abdallah, (2010) stated the ability of the user to operate the ERP application is described as being improved and made easier through training, in addition to that ERP training is one of the most significant critical success factors (CSF) for the Implementation of ERP systems.

Because of this, businesses must prioritize training in order to raise employee skill levels and ease users' transitions between jobs within the organization. In addition, employees who have received the appropriate training can use the system's features more effectively and motivate and attract new users (Calvert, 2006).

Given that the system environment is constantly changing and that user training is necessary during the evolution phase to enhance, or at the very least maintain, the users' capability and expertise of using the system, users may be encouraged to continue their training and become more engaged and cooperative in collaboration with other departments (Ha & Ahn, 2014). It is vital to keep in mind while discussing how ERP training should be carried out most eficiently because the users should not only be trained in how to use the functionality of the systems, but they may also need to relearn their professions, which might be an even more dificult process. (Scott, 2005).

2.3.3 **Process**

This dimension focuses on how users must redesign their workflows to be able to accommodate functionalities and new business models (Esteves, 1999). When a new system is first introduced, this is a massive undertaking, but in a cloud-based ERP environment, incremental upgrades are often minimal and don't significantly alter the current operations, furthermore, because cloud ERP primarily caters to SMEs, adaptations are (in most circumstances) quite uncommon in the cloud ERP space (Goel et al., 2011).

2.3.4 **Change management**

Change management is known as the process of coordinating and administering changes presented to business applications and processes (Foster et al., 2007). Moreover, it also seeks to warrant the readiness and acceptance of the new system, to permit the organization to gain the benefits of its use (Esteves, 1999). As a result, change management is regarded as one of the key success criteria for ERP systems (Goel et al., 2011).

Even though, according to Seethamraju, (2015), there is no guarantee that users of an organization's cloud-based ERP system would accept changes and eficiently utilize the additional capabilities. Also, many times, resolving change management concerns is thought to be more challenging than handling technical issues (Albadri & Abdallah, 2010). A study presented by Seethamraju, (2015) noted that one of the biggest obstacles in the post-implementation phase was convincing customers to use both the newly provided and existing functions by teaching and training them on how to do so.

2.4 General Benefits and Challenges of Cloud ERP Systems

Even though cloud ERP has proven some benefits compared to conventional ones, there are still some associated challenges. In this section, a brief presentation made by Abd Elmonem et al., (2016) on the benefits and the general challenges associated with the utilization of cloud ERP will be discussed. As presented in Table 1, a brief mentioning of the different benefits and a description of its effect on the running business. In addition to that, the general challenges associated with the execution of cloud ERP systems are introduced in brief in Table 2.

Table 1. Cloud ERP systems benefits (Abd Elmonem et al., 2016).

Benefits	Description
Lower upfront costs	Because of the segregation of computing resources from company location, businesses only need to pay for an internet connection; moreover, they are not responsible for establishing the computing environment.
Lower operating costs	The cloud service providers (CSP) are in charge of running and supplying the cloud services, which will result in separating the operation expenses and processes from the business.
Rapid implementation	CSPs provide a variety of ERP systems that can address the majority of business requirements. According to the requirements of the enterprise business, different solutions and products are selected. This selection procedure hastened the implementation process.
Scalability	Because cloud services are elastic in nature, businesses can adjust how many resources are being used based on their present demands.
Focus on core competencies	Cloud ERP systems help the enterprise to manage its business more eficiently and give the enterprise a chance to focus on other concerns related to its core activities.
Using advanced technology	The firm can employ the specialized technology and cuting-edge

	computing resources that are offered via the cloud by working over it.
Rapid updates and upgrades	Update or upgrade cloud solutions accomplished faster than traditional ERP applications. In addition to that, the CSPs perform all upgrade processes according to the enterprise requests.
Improved accessibility, mobility, and usability	The open environment in which cloud-based applications operate expands the options for accessibility. Moreover, the increased accessibility improves the cloud ERP's usage both inside and outside of the company.
Easier integration with cloud services	There are a ton of cloud applications available to meet the needs of the business. In addition to that, ERP systems' inherent ability to link many parties both inside and outside the company makes cloud integration with other services simpler.
Improved system availability and disaster recovery	For backup, restore, recovery, and all other tasks related to availability and disaster recovery, CSPs offer clearly defined rules and strategies.
Cost transparency	Depending on the enterprise plan, pay-per-use, or subscription models. Moreover, businesses only pay for the services they utilize; paying for non-essential services or services that fall short of their demands is not necessary.
Sales Automation	The geographical distance between clients and CSPs allowed the automatic resolution of sales concerns via the cloud.
Using Security Standards	Some CSPs have implemented standards for decryption and encryption which have allowed the responsibility for security to shift from clients to CSPs.
Free trials	Many cloud ERP vendors let prospective customers test the systems before buying them. The reliability of the cloud ERP's use is increased by these trials.

Table 2. Cloud ERP systems challenges (Abd Elmonem et al., 2016).

Challenges	**Description**
Subscription expenses	Businesses must subscribe to the services they utilize to use cloud

	ERP, and they must continue to pay the subscription fees over time.
Security risks	Security threats can rise as a result of the cloud's high availability for cloud services. Moreover, managing security concerns for an ERP system is a complicated procedure.
Performance risks	Clients and CSPs can communicate with one another through the cloud despite being geographically apart from one another. Over the cloud, network outages and numerous other connection issues are possible. So, as a result, that will affect the cloud ERP performance directly.
Customization and integration limitations	ERP systems are provided by CPSs in bundles with few opportunities for modification and integration. On other hand, these constraints are not present in conventional ERP systems.
Strategic risks	Because they rely on CSPs, firms assume a strategic risk and are obligated to comply with their policies.
Compliance risks	Other challenges addressed by cloud-based ERP include adhering to data, energy, and environmental requirements, yet there are insuficient rules to address these challenges.
Loss of IT competencies	Numerous tasks will be transferred from the IT department to the cloud ERP provider to switch to cloud ERP. This move can result in IT competencies and pushback from the IT department.
Functionality limitations	Traditional ERP systems have reached an advanced maturity level as time goes on, gaining more stability and maturity. It will take time for cloud ERP to reach this stability and maturity.
SLA Issues	The process of defining Service Level Agreements (SLAs) for cloud ERP is quite dificult and complex; it must take into account all facets of the offered services, including customization and integration.
Sensitivity of the information	Many businesses view their data and information as private property that must remain inside the business.
Control over cloud ERP	Cloud ERP systems are geographically outside the company, and their control procedures are more stringent than those of traditional ERP.

Hidden costs in the contract	Contrasting cloud ERP solutions may reveal hidden expenses like coordination costs, transfer costs, and monitoring costs.
Loss of technical knowledge	The technical knowledge of the service may fade with time for the IT staff deploying cloud ERP solutions.
Migration between CSPs	Moving between multiple CSPs is a significant dificulty that clients of cloud ERP may have. Moreover, CSPs provide a variety of similar ERP systems at various price points.
Need for ERP as service standards	The market for cloud-based ERP systems is still relatively new. The management of it between cloud ERP providers and clients is not subject to any defined rules and norms.
Knowledge about the cloud	Generally, people are concerned about new technologies and the effects that using these technologies will have on their businesses. In addition to that, cloud ERP providers should pay close attention to clearly describing the cloud ERP services and facilities so that clients can understand them.
Startup support	Clients and consumers need assistance from the cloud ERP supplier to make the transition from traditional ERP to Cloud ERP.
Organizational challenges	Instead of technological problems, the process of installing Cloud ERP systems may encounter organizational challenges, such as top management involvement and poor cross-functional communication.
Choosing between Cloud ERP systems	There are many cloud ERP systems on the market now that were created by various providers. Deciding between these systems is dificult. An issue is also choosing the people who will be involved in assessing and selecting the best cloud ERP solution.

3 Challenges of Cloud-ERP Adoptions in SMEs

Small and medium-sized businesses (SMEs) are acknowledged for having significantly influenced socio-economic growth, moreover, SMEs gain recognition due to their contributions to the nation's and its programs' sustainable development (Haji Salum & Abd Rozan, 2016). According to European Commission, (2003) the term "micro, small, and medium-sized enterprises" (SMEs) refers to companies with less than 250 employees and annual balance sheet totals of up to EUR 43 million or an annual turnover of up to EUR 50 million. In the EU, small and medium-sized businesses (SMEs) account for 99% of all companies. For financial access and EU support programs geared specifically at these businesses, it is crucial to understand what an SME is.

The right usage of Information and Communication Technologies (ICT) by SMEs could enhance their potential to compete with large enterprises in their business operation (Haji Salum & Abd Rozan, 2016). Popli & Sarin, (2015) stated that SMEs are acknowledged as the main revenue generators

in any growing economy. With an ERP system, SMEs can manage their operations and data more effectively, as mentioned earlier, ERP is an integrated system that organizations use to enhance decision-making, enhance data management and procedures, streamline production, and provide interdepartmental capabilities, in addition to that, it is renowned for having a variety of beneficial features and capabilities to streamline business operations (Shahawai & Idrus, 2011).

Due to the unique and potential advantages that cloud computing offers to both SMEs and large corporations, it has become an interesting field of research for both researchers and practitioners, additionally, three cloud service models are available with cloud computing: SaaS, PaaS (Platform as a Service), and IaaS (Infrastructure as a Service) (IaaS) (Haji Salum & Abd Rozan, 2016).

Despite the acknowledged significant advantages or benefits obtained when SMEs use ERP systems, conventional ERP systems are typically expensive to buy and maintain, which prevents SMEs from investing enough money in them (Fuller, 2010). However, the rise of cloud computing enabled resource sharing, scalability, and low-cost ERP offerings on the cloud platform, moreover, the ERP system is offered as a service rather than a product under the cloud platform structure, allowing SMEs to rent it rather than purchase it (Armbrust et al., 2010). Olson, (2007) stated that SMEs who utilize cloud ERP systems can focus more on their principal business function while reducing upfront costs (cost of deployment and maintenance) by renting the ERP system, this allows them to avoid spending considerable efforts to maintain the ERP system.

The expense of maintaining all resources in remote locations is reduced for businesses using cloud computing, in contrast to their similar large

counterparts, who made significant financial investments in on-premise ERP, cloud technology offers SMEs a clear advantage in that they may benefit from cloud technology with less investment (Kirubakaramoorthi et al., 2015).

When compared to on-premise ERP system customization, cloud ERP systems require significantly less customization, which results in labor and development team costs being cut by 50%, software testing costs being reduced by 10%, requirement analysis efforts being reduced by 25%, maintenance, and support costs being cut by 40%, and backup management costs being reduced by 15% (A. Al-Johani & E. Youssef, 2013). In this chapter, a discussion about the challenges associated with the utilization of cloud ERP systems in SEMs during each phase of the operation will be presented in brief. The utilization of cloud ERP systems is usually done through stages or phases, according to Haddara et al., (2022) those phases or stages can be summarized into four main phases. During the execution of cloud ERP, several challenges might show up, every phase has its own unique challenges.

3.1 Phase 1 - The Project Chartering Phase

3.1.1 Customization

According to Lewandowski et al., (2013), customization is frequently seen as one of the biggest obstacles preventing SMEs from adopting and implementing cloud-ERP, in addition to standardized cloud-ERP packages can be challenging, expensive, and time-consuming to customize, So, both parties' flexibility—including that of the SME and the cloud service provider—is crucial during the ERP adoption process.

Seethamraju, (2015) presented a study showing that SMEs had varying opinions about software as a service (SaaS) ERP, although two of the case

study participants saw this as a long-term fix. Two further firms, however, saw it as a stopgap measure before a later deployment of a personalized on-premises solution. Hence, SMEs may be discouraged from deploying such a system if they intend to expand and require more complicated ERP operations due to the restrictions of modifying cloud-ERP solutions. Moreover, the negligence in choosing a cloud-ERP package has an impact on all aspects of adoption, including time frames, costs, objectives, and success.

So, the solution is vulnerable to extensive changes since an unsuitable package was chosen for the SME's needs and specifications (Ganesh & Mehta, 2016). Moreover, offering all SMEs access to a common cloud-ERP platform places restrictions on customization on the system suppliers (Salum, 2015). Based on Seethamraju, (2015) case study, the limitations in customization opportunities led to conflict between vendors and adopters, necessitating the necessity for the consultants to deal with the disgruntled firm management to resolve these issues. In addition to that, A. Al-Johani & E. Youssef, (2013) stated that It's also vital to note that vendors have easier access to simple customization requests than they do to requests for more complicated alterations.

While on other hand another study presented by Gupta et al., (2017) shows that while personalization is a key dificulty in cloud-ERP with standardized applications for all users, SMEs may not find it as pressing as LEs do, moreover, it was determined from a quantitative data study comparing the hurdles faced by SMEs and LEs concerning customization that SMEs have fewer complex systems and procedures, so, in turn, decreases the implementation problems associated with customization, for LEs who require greater integration choices with their intricate legacy systems, this functionality is especially crucial.

So, Duan, (2013) stated that SMEs should be aware of the constraints of adapting cloud-ERP systems if they require moderately complex interaction with existing systems. On other hand, Johansson et al., (2015) claimed that, despite the acknowledged dificulties with the customization, small and medium-sized businesses profit greatly from cloud-based ERP solutions.

3.1.2 Vendor lock-in/switching-costs

Gupta et al., (2017) stated that Vendor lock-in/switching costs draw on a worry about the reliability of cloud-ERP vendors. So, trust becomes an essential success factor because the suppliers have access to large amounts of crucial data, furthermore, it may be challenging for businesses to switch cloud-ERP providers if they are dissatisfied with the program because the vendor owns the information and data of its users, as a result, negotiating a service level agreement (SLA) could assist the two parties in condensing their expectations and understanding of the agreement if there is a recognized danger that this will occur.

Unfortunately, SLAs frequently leave out confidentiality provisions, opening the door to potential conflict (Duan, 2013). In addition to that, Lewandowski et al., (2013) suggest that due to the financial effects, SMEs' judgments about cloud ERP vendors may be influenced by a system's subscription costs.

Seethamraju, (2015) introduced a study showing that in the long run, the overall cost of a monthly cloud-ERP subscription will not be much less than that of an on-premises ERP solution, in addition to that, changing cloud-ERP vendors needs significant additional indirect expenses for migrating data, systems, and processes to fit another vendor's cloud-ERP system, despite the pay-per-use monthly subscription structure. On the contrary, another literature presented by A. Al-Johani & E. Youssef, (2013) underlined that

overall cloud-ERP implementation costs were considerably cheaper than those for on-premises implementations, moreover, the latter demands money for maintenance, technical support teams, hardware, and other expenses.

3.2 Phase 2 - The Project Phase

3.2.1 Compliance

Compliance is a key success aspect for how well the cloud-ERP software conforms with and fits the adopting firm, in addition to that, the system must be profitable for the firm and provide smooth support for all operational procedures (Seethamraju, 2015). Ganesh & Mehta, (2016) stated that high-quality data must be migrated from legacy systems or business operations, which means that it must have a consistent format, be timely, and be accurate.

In addition to that, the geographic location of SMEs must also identify their compliance with laws and legislation (Gupta et al., 2017). While is worth mentioning that, companies may encounter a regulation violation risk with cloud-ERP if they weren't properly handled earlier because legislation and jurisdiction standards differ and can be fairly cryptic (Usman et al., 2016).

A study presented by Duan, (2013) showed that the identification of issues with cloud-based operations complying with environmental norms and energy standards was presented. However, on contrary, another study introduced by Gupta et al., (2018) showing that the dificulties SMEs experience because of the demands made on them by the government to use ERP systems to comply with specific regulations.

3.2.2 Integration

A research paper presented by Ganesh & Mehta, (2016) suggested that data integration is regarded as one of the major obstacles to SMEs adopting cloud ERP because it could result in implementation issues and delays. While addressing customization-related dificulties, Duan, (2013) draws attention to the related integration problems that affect both the cloud-ERP provider and the adopting firm. For instance, a study on Indian SMEs that anticipated extensive changes resulted in a dificult project situation, making the ERP package an inappropriate piece of software for their nesses (Ganesh & Mehta, 2016).

Challenges with customization are influenced by corporate culture as well as how sophisticated the company's current infrastructure is. This issue was demonstrated by a participating corporation where a two-and-a-half-year delay in cloud-ERP integration might be attributed to problems with change management involving the organizational culture, moreover, a new cloud-ERP system's interface with an outdated on-premise ERP system may dramatically increase the installation expenses of the transition project, in addition to that, certain cloud-ERP solutions are dificult to integrate with on-premise ERP systems (Gupta et al., 2017).

3.2.3 Data extraction

Bjelland & Haddara, (2018) stated that data extraction is not commonly discussed in cloud-ERP, however, SMEs could encounter a mismatch of data when information and data with common names are retrieved from a cloud since it may be challenging for the users to decide which data to select for extraction, which may cause user uncertainty in the data extraction process (Gupta et al., 2017).

Data extraction may therefore be a significant obstacle to SMEs' adoption of cloud-based ERP, in addition, since SMEs are typically restricted to using public clouds, which could impede connectivity, security and the speed of data extraction may be problems for them, so, users of public clouds may find the extraction processes to be more dificult than those of private clouds (Alsafi & Fan, 2020).

3.3 Phase 3 - The Shakedown Phase

3.3.1 Readiness

Seethamraju, (2015) presented a case study showing that the decision to use a cloud-based ERP system or a conventional on-premises ERP system may be influenced by the technological and business process preparedness of firms adopting ERP, in addition to that, some businesses are constrained from growing due to ineficient business processes and technology quality issues related to their ineficient ERP operations since they are still using outdated legacy systems to manage ERP operations. Moreover, Alsafi & Fan, (2020) emphasized that the Implementations may take longer to complete if there are insuficient technological and procedural preparations.

Furthermore, the shakedown phase will probably be prolonged if a cloud-ERP implementation fails because the vendor is not fully equipped in terms of process analyses and support (Bhati, 2017). Ganesh & Mehta, (2016) stated that it is essential for the systems to function as "normal" throughout the project's shakedown phase, and moving forward, ERP consultants should identify any potential issues they are likely to encounter throughout the adoption project.

3.3.2 Organizational change

The change management process should take into account any necessary adjustments to the company culture, decision-making procedures, top management support, the staff's atitudes toward the change, and other elements that need to be changed to proceed with an eficient and successful adoption for a company to be prepared for a cloud-ERP implementation (Qian et al., 2016).

Research presented by Seethamraju, (2015) has shown that change management is essential for a cloud-ERP implementation's success because these projects frequently run into problems, moreover, the management of projects and changes is essential to the implementation process. In addition to that the corporation must pursue clearly defined objectives and goals to manage change effectively across the organization, train workers on new business procedures, and prepare for change.

The cloud-ERP system will not be operating to the fullest extent of its capabilities and purposes due to inadequate system education and technical personnel training, despite the necessary technical preparations, poorly managed initiatives have been demonstrated to be more susceptible to failure (Ganesh & Mehta, 2016). Since the operational managers receive control from vendor consultants and are expected to be able to drift the systems and users to work casually during the shakedown phase of the project, poor change management will make this phase more dificult (Markus, 2000).

All the firms that took part in the study by Seethamraju, (2015) had to cope with insuficient change management issues for the latter portion of the installation and post-implementation phases to ensure a successful ERP adoption. The organizational changes that follow a cloud-ERP adoption

include, among other things, user education and training, process knowledge, and obtaining the requisite competencies and skills for leveraging the system's features and applications.

In these situations, the comprehension and use of the systems got better over time. This may be explained by earlier research introduced by Markus, (2000), which shows how ERP production declines during the shakedown phase but gradually stabilizes and increases over time.

3.4 Phase 4 - The Onward and Upward Phase

3.4.1 Data security

Data and sensitive information are managed by the cloud service provider in cloud-ERP systems, which may be perceived as a danger to SMEs' security, privacy, and confidentiality by some., moreover the risks to data security are therefore frequently listed as the main issues with a cloud-ERP adoption (Salum, 2015).

The organization trusts the software provider with critical business data, such as customer information, financial data, and other operational information, when installing a cloud-ERP system, therefore, monitoring and securing this data has become a top worry for SMEs because cloud-ERP companies are entirely in charge of administering all upkeep, upgrades, and application advancements (Gupta et al., 2018).

As cloud-based services are frequently thought to be appropriate for operations where privacy concerns and data security are of less importance, concerns about the vendor's internal infrastructure, or other companies using the same infrastructure, hacking, and vendors' privileged control over

sensitive data are central to cloud-ERP implementation security (Faasen et al., 2013).

Inversely, Johansson et al., (2015) argue that security concerns about cloud-ERP implementations in SMEs are less of a concern than they are in LEs and explain how cloud-ERP systems may enhance SMEs' data security by providing high levels of protection from vendors that the SMEs themselves are unable to implement. Similarly, to this, Duan, (2013) contends that while SMEs still face security threats, those risks are reduced. Nonetheless, security has been recognized as the top dificulty for Cloud-ERP adoption in the literature studied in this study, contradicting the corporate managers participating in Seethamraju, (2015)'s case study who did not regard security issues as key concerns for their cloud-ERP installations.

3.4.2 Performance

Salum, (2015) stated that unexpected system performance during deployment is a major worry. An unreliable or slow internet connection, poor customer service from the cloud vendor, or downtime of the cloud servers can all lead to inconsistent performance, which lowers the system's reliability. Moreover, Gupta et al., (2017) observed that because SMEs frequently lack access to high-speed connections, their network dependency has an impact on how well they utilize cloud-ERP systems.

They contend that multiple tenants could cause longer download and upgrade times. Furthermore, it is noted that constrained cooperation with other organizational departments may have an impact on the performance of SMEs. This constrained collaboration is connected to vendors' restrictive application provision and integration outside the core ERP modules. According to research by Duan, (2013), the performance of SMEs is directly

correlated with and imperiled by the dangers of poor network connectivity and reliability, outages, and constraints on data processing and transfer.

3.4.3 Reliability

The business complexity of SMEs has been noted in the literature as a hurdle when installing cloud-ERP systems. Because of SMEs' restricted access to the fastest Internet connections required for processing such huge data quantities, managing large data sets is viewed as a worry, which could lead to system lags and decreased system reliability (A. Al-Johani & E. Youssef, 2013). Other concurrent operations may experience increased stress and delays as a result of this system instability (Gupta et al., 2018). So, due to increased volumes of data interchange and processing, performance typically declines as the number of cloud-based ERP users rises (Johansson et al., 2015).

Poor connectivity and decreased reliability were linked to dangers related to vital business processes that could disrupt the company's basic operations, as Faasen et al., (2013) highlighted in a case study on South African SMEs. Moreover, business managers have voiced distrust dificulties, worries, and dependence on cloud-ERP vendors as well as a lack of control over data processing. So, as a result, the uncertainty surrounding the company's success, which will be based on the caliber of the vendor's service, personnel, and control, was the source of the worry.

Contrarily, Johansson, et al., (2015) asserted that dependability and bandwidth issues are particularly serious for businesses that demand seamless application performance and a high level of technical competence and that this is more applicable to LEs than to SMEs. However, a decreased network stability that results in a slower connection speed explains why

there is a focus on poor performance as an implementation-related problem. One of the SMEs included in a case study had some dificulties due to restricted bandwidth in remote places, where Seethamraju, (2015) exemplified this problem; nonetheless, this was not thought to be a serious problem generally.

3.5 General Discussion about the challenges during Execution

There is no question, or very little doubt, that cloud-based ERP systems have several advantages for SMEs, according to the literature that is currently available on the subject. Even though literature frequently concludes that implementation-related cloud-ERP issues are more common in LEs than in SMEs, it is still crucial to carefully evaluate the risks and obstacles of a cloud-ERP installation in SMEs. There are differences in opinion regarding how

much certain issues experienced by LEs also apply to SMEs, as seen in section four. The review's chosen literature acknowledges that SMEs encounter implementation problems with cloud-ERP, but when these problems are contrasted with those experienced by their LE counterparts, there is a propensity to undervalue them.

There is a probability that by contrasting SMEs, their problems or potential hazards with cloud-ERP deployments may disappear. Limitations on customization, security threats, and reliability and their effects on SMEs are among the topics that have received the greatest attention in the current literature examined in this research. These topics also stand out as areas where the literature appears to disagree the most. The most frequent problems mentioned in the literature are matched to the appropriate lifecycle phases below.

3.5.1 Phase One

Although the Project Chartering process establishes the solution limits and extension limitations, customization restrictions for cloud-ERP installation are frequently acknowledged as one of the major obstacles. According to the findings of various studies, concrete limits by themselves may not be a problem, but the ambiguity and unrealistic expectations that come with modification may lead to disputes between the system vendor and the SMEs. SMEs should be aware of the restrictions if they intend to make intricate changes to the cloud-ERP packages, regardless of whether customization limitations are more relevant to LEs than SMEs.

3.5.2 Phase Two

The project phase uncovered issues with the SME's implementation of the cloud-ERP system and its compliance. This includes how well the new cloud-

ERP systems integrate with the SMEs' existing data and systems, as well as their quality. This will affect all aspects of the implementation process, including time constraints, eficacy, quality, and accuracy. In cloud-ERP systems, challenges with data integration and delays could increase project expenses. The articles also discussed the significance of understanding that jurisdiction and regulation compliance of cloud systems vary and depend on the location of the business.

3.5.3 Phase Three

The thesis findings demonstrate that effective project and change management are necessary for cloud-ERP adoption. According to the literature, the employees and management must properly use the system; as a result, staff education and training are crucial to reducing the likelihood of adoption failures. The ERP system and business process transformation still depend on the cloud-ERP vendor's capacity to fully employ its apps and features, even if they are well-prepared and skilled for successful system implementation.

A cloud-ERP solution, however, could see a performance decline after implementation, as was previously mentioned. This was discussed as perhaps being brought on by a fall in business performance during the adoption lifecycle's shakedown phase, which was followed by reasonably constant growth over time.

3.5.4 Phase Four

Since businesses want to safeguard and have control over their sensitive data, data security has emerged as one of the top issues for SMEs in adopting cloud-ERP. The literature is divided, nonetheless, regarding which data security concerns apply to SMEs. The majority of data security threats,

according to two of the articles in this thesis, pertain to LEs, but SMEs are also at risk. In conclusion, this dificulty seems to rely on the size, resources, and type of company used by SMEs, and it should be taken into account in every adoption of cloud-based ERP.

Similarly, there was disagreement in the literature regarding the hazards associated with network dependability and cloud-ERP system dependency, as well as the vendors' capacity to offer streamlined connections and applications that add value to business processes. As was argued in the majority of articles, SMEs frequently experience operational problems that have an impact on their overall business success. Hence, dependability concerns appear to be a key consideration when assessing cloud-ERP system adoption for SMEs.

4 The Conclusion

This thesis introduced a brief introduction to digitalization and its effect on the new business model while presenting and focusing on one of the most important tools that have been utilized in the last decades in business integration and management, which is ERP systems, and the main focus was on cloud ERP. Cloud ERP system is presented and discussed in a brief showing a brief history of the evolution of the ERP system since its first

appearance with a different name and few functions in the early 1960s while mentioning the main benefits and challenges associated with the utilization of cloud ERP over conventional ERP system. The Design/methodology/approach for the research is based on a wide literature review, focused on the challenges associated with the execution of cloud ERP system in SMEs. The main used literature reviews are Haddara et al., (2022), Gupta et al., (2017), Haji Salum & Abd Rozan, (2016), Abd Elmonem et al., (2016) and Awan et al., (2021)

Generally, ERP concepts can be divided into five main categories during the last six decades. The first generation between 1960 and 1970 was Material Requirement Planning (MRP), which aim to predict material requirement. The second generation in the ’80s was MPR-II, which aims to manage manufacturing resources. The third generation in the ’90s was ERP, which aims to integrate the enterprise. The fourth generation in the 2000s was ERP-II, which aims to go beyond the enterprise. Finally, the fifth generation in 2010 and beyond is ERP-III, which utilized cloud computing technology.

To have a deep understanding of ERP systems, it’s important to recognize their lifecycle framework. A brief introduction to the ERP lifecycle framework including its main phases and dimensions was presented and discussed. Generally, the ERP lifecycle framework consists of main six phases which are adoption decision, acquisition, implementation, use & maintenance, evolution, and finally retirement, which represents its life stages within any organization. In addition to that, it has four main dimensions, which are change management, people, process, and product, which are seen as viewpoints that can be used to analyze those phases.

General benefits of utilizing cloud ERP were presented, which are Lower upfront costs, lower operating costs, rapid implementation, scalability, focus

on core competencies, using advanced technology, rapid updates and upgrades, improved accessibility, mobility, and usability, easier integration with cloud services, improved system availability and disaster recovery, cost transparency, sales automation, using security standards, and finally free trials. In addition to that, general challenges associated with the utilization of cloud ERP were introduced such as subscription expenses, security risks, performance risks, customization and integration limitations, strategic risks, compliance risks, loss of its competencies, functionality limitations, SLA issues, the sensitivity of the information, control over cloud ERP, hidden costs in the contract, loss of technical knowledge, migration between CSPS, need for ERP as service standards, knowledge about the cloud, startup support, organizational challenges, choosing between cloud ERP systems

The main purpose of this thesis is to understand the current situation for the utilization of cloud ERP in general and in SMEs in particular. SMEs are acknowledged for having significantly influenced socio-economic growth, moreover, SMEs gain recognition due to their contributions to the nation's and its programs' sustainable development. The right usage of Information and Communication Technologies (ICT) by SMEs could enhance their potential to compete with large enterprises in their business operation. With an ERP system, SMEs can manage their operations and data more effectively,

The challenges associated with the execution of cloud ERP in SMEs can be divided into four phases of execution. The first phase is project chartering which consists of customization and vendor lock-in/switch costs. The second phase is the project execution, which has three main elements, compliance, integration, and finally data extraction. The third phase is the shakedown phase, which consists of two main elements, which are readiness and organizational change. Finally, the final phase which is the onward and

upward phase, which has three main elements, which are data security, performance, and reliability. The above-mentioned phases and the associated challenges during the execution were discussed and presented from several studies made regarding utilizing cloud ERP in different SMEs in different markets and countries.

4.1 Further research

The findings of this thesis can be used as a guide for the SMEs which have the intention to utilize cloud ERP to maximize their benefits and reduce utilization costs. Further research may include a deep investigation of the results obtained from real case scenarios, where some SMEs in developing countries utilize cloud ERP, and then a comparison can be made for the enterprise's performance before and after the usage of cloud ERP.

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