2020

Implementing Cloud-Based Enterprise Resource Planning Solutions in Small and Medium Enterprises

Ali Hamdar
Walden University

Walden University

College of Management and Technology

This is to certify that the doctoral study by

Ali Hamdar

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Review Committee
Dr. Diane Dusick, Committee Chairperson, Doctor of Business Administration Faculty

Dr. Theresa Neal, Committee Member, Doctor of Business Administration Faculty

Dr. Ify Diala, University Reviewer, Doctor of Business Administration Faculty

Chief Academic Officer and Provost
Sue Subocz, Ph.D.

Walden University
2020

Abstract

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Ali Hamdar

MS, American University of Science and Technology, 2011

BS, Lebanese University, 2006

Doctoral Study Submitted in Partial Fulfillment

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Doctor of Business Administration

Walden University

August 2020

Abstract

Lacking strategies to implement a cloud-based enterprise resource planning (ERP) solution in small and medium-sized enterprises (SMEs) can lead to a failed implementation. SME owners can improve company performance by integrating company processes by successfully implementing a cloud-based ERP solution. Grounded in the diffusion of innovation theory augmented with business process management design for Six Sigma, the purpose of this qualitative multiple case study was to explore strategies SME owners use to implement cloud-based ERP solutions. The participants consisted of 4 SME owners in Lebanon who successfully implemented a cloud-based ERP solution and improved company performance and growth. Data were collected using semistructured interviews and a review of ERP implementation project documents and analyzed using thematic analysis. Seven themes emerged: top management support for IT implementation, requirements identification, software selection, user involvement, project management, change management, and post-implementation performance monitoring. A key recommendation for SME owners is to support IT implementation and remain involved throughout the implementation process. The implications for positive social change include the opportunity to increase employment opportunities, economic growth, and reducing the adverse environmental consequences of computing by using cloud-based technologies.

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Section 1: Foundation of the Study

Internet innovations have led to increased accessibility for enterprises in terms of technology capabilities (S. Cheng & Li, 2018). Cloud computing is an Internet innovation that enables business owners to use applications without the need for any computing infrastructure (Yang, Huang, Li, Liu, & Hu, 2017). Leaders at small and medium-sized enterprises (SMEs) use enterprise resource planning (ERP) systems to integrate operations, processes, and resources of an organization (Rouhani & Mehri, 2018). Cloud-based ERP solutions are accessible from the Internet without any IT infrastructure or on-premise deployments (Sørheller, Høvik, Hustad, & Vassilakopoulou, 2018). The purpose of this qualitative multiple case study was to explore the strategies that SME owners use to implement cloud-based ERP systems. Adopting cloud-based ERP implementation strategies might help SME leaders successfully automate business processes and improve company performance while reducing operating expenses.

Background of the Problem

Implementing an ERP solution to automate business processes has the potential to improve a company's performance and growth. However, inefficient implementation strategies of automation will not generate the expected results, especially in SMEs (Zerbino, Aloini, Dulmin, & Mininno, 2017). Cloud-based ERP technology addresses the inflexibility of existing ERP software by allowing company leaders to automate business processes rapidly without the need for information technology (IT) resources or infrastructure. SME owners can use cloud-based ERP as a flexible and cost-effective

solution to improve company performance and growth (Salim, Sedera, Sawang, Alarifi, & Atapattu, 2015).

SMEs are the drivers of socioeconomic development and have a positive influence on entrepreneurship, job opportunities, poverty reduction, and economic growth (Jamali, Lund-Thomsen, & Jeppesen, 2017). SMEs represent more than 90% of global companies and enterprises worldwide (Rekik & Bergeron, 2017). Despite the role that SMEs play in economic growth, few researchers addressed the issue of improving SMEs' performance and growth through ERP implementation. This lack of research is a reason for researchers to focus on exploring successful cloud-based ERP implementation strategies in SMEs. The main objective of this study was to explore strategies that some SME owners use to implement cloud-based ERP to improve business performance and growth.

Problem Statement

Many owners of small and medium-sized businesses lack strategies to use IT to streamline processes and keep the focus on core company competencies (Budiarto, Sari, Sudaryana, & Prabowo, 2018). SME owners fail at a rate of 65% to 70% in terms of successfully adopting and using a cloud-based ERP system (Saeed et al., 2017). The general business problem was that small and medium business owners often lack strategies to implement cloud-based ERP solutions to integrate with all business processes. The specific business problem was some SME owners lack strategies to implement cloud-based ERP solutions to improve business performance and growth.

Purpose Statement

The purpose of this qualitative multiple case study was to explore strategies that SME owners use to implement cloud-based ERP solutions to improve business performance and growth. The target population consisted of owners from four SMEs who have successfully implemented cloud-based ERP strategies to improve business performance and growth in Lebanon. The implications for positive social change included providing stable job opportunities, reducing poverty in Lebanon through economic growth, and reducing the environmental consequences of computing by using cloud-based technologies.

Nature of the Study

There are three main research methods: (a) qualitative, (b) quantitative, and (c) mixed methods (Yin, 2018). The qualitative approach is an inductive and interpretive approach based on the supposition that reality is socially constructed and context-dependent (Teherani, Martimianakis, Stenfors-Hayes, Wadhwa, & Varpio, 2015). Researchers using the qualitative method first collect data and then attempt to derive explanations from the data (McCusker & Gunaydin, 2015). With the quantitative approach, researchers use predefined mathematical and statistical models to examine relationships among variables (Choy, 2014). Mixed methods researchers use and integrate both quantitative and qualitative data to provide a comprehensive understanding of the research problem (Palinkas et al., 2015). The objective of this study was not to inspect or validate any statistical relationships among variables but to explore strategies that Lebanese SME business owners used to implement cloud-based ERP systems

successfully. Hence, both quantitative and mixed methods were inappropriate for the study. The qualitative method was the most appropriate to explore the strategies that Lebanese SME business owners used to implement cloud-based ERP systems to improve performance and growth. For these reasons, I used the qualitative method for this study.

I considered four options for qualitative research designs to explore strategies that Lebanese SME owners use to implement cloud-based ERP solutions to improve business performance and growth: ethnography, phenomenology, narrative, and case study. Researchers adopting the ethnographic design focus on the explanation and analysis of patterns observed in terms of people's experiences and activities within their culture and social context (Drake & Harvey, 2014). Researchers using phenomenological designs emphasize description and interpretation of the experiences participants have in common related to a phenomenon (Mayoh & Onwuegbuzie, 2015). Narrative design includes descriptions of experiences as expressed in lived and told stories of individuals (Suárez-Ortega, 2013). The objective of this study was to collect and analyze data from multiple interviews of SME owners; hence, ethnographic, phenomenological, and narrative designs were inappropriate for the study. The case study design was a more appropriate study design for my area of interest.

The case study design involves an in-depth study of specific situations, occasions, or processes (Cronin, 2014). A researcher implementing a case study design obtains evidence such as interviews, documents, direct observation, participant observation, archival records, and physical artifacts from multiple data sources (Yin, 2018). Researchers can ensure validity of outcomes and findings by using multiple case studies.

The multiple case study design was most appropriate for this study because the design supports the collection, analysis, and interpretation of data from multiple SMEs and the comparison of results across organizations successfully to address the business problem. For these reasons, I used a multiple case study design for this study.

Research Question

What strategies do SME owners use to implement cloud-based ERP solutions to improve business performance and growth?

Interview Questions

1. What strategies have you used to successfully implement an ERP system in your company?

2. What were the key challenges that you faced during the implementation phases?

3. How did you address the key challenges faced when implementing your strategies?

4. What were the principal types of training you and others received before or during ERP implementation?

5. What, if any, were the critical success factors that you used to ensure successful implementation of the cloud-based ERP solution?

6. How, if at all, did your company align its business plans with cloud-based ERP implementation?

7. Based on your organization's experience, how did implementing cloud-based ERP solutions improve business performance and growth?

8. What else can you add to explain what strategies Lebanese SME owners use to implement cloud-based ERP solutions to improve business performance and growth?

Conceptual Framework

The conceptual framework for this study consisted of the diffusion of innovation (DOI) theory augmented with the business process management design for Six Sigma. Everett Rogers developed the diffusion of innovation theory in 1962 as the theoretical framework for exploring or examining the process of innovation in channels of communication for members of social systems over time. Researchers may adopt the DOI theory as a framework of connected components for processing a solution to a problem and accomplishing a common goal (Scott & McGuire, 2017). SME leaders can implement techniques and tools that comprise Six Sigma using a social system applied with the DOI theory.

In 1986, leaders in the Motorola Company developed the Six Sigma quality improvement project to enhance quality, optimize business processes, reduce costs, and increase profits (Chen, Chen, & Chang, 2017). According to the principles of Six Sigma, any process, activity, or workflow that does not contribute to a company's key business goals and objectives results in waste (J. L. Cheng, 2017). When applied to business processes, Six Sigma is useful for eliminating waste from a process through the implementation of different optimization methods such as Pareto analysis, cause and effect diagrams, and root cause analysis (Aqlan, 2018). Taken together, the DOI

framework and Six Sigma offer researchers a way to explore the adoption strategies of ERP cloud services by SME owners (V. Gupta & Bhatia, 2017).

Researchers have applied the DOI framework to studies of the diffusion and adoption of IT and Internet innovations (Choi, Nazareth, & Ngo-Ye, 2018). SME leaders should further understand the business processes, details of work and activities, and how that work relates to the organizational strategy (Meidan, García-García, Escalona, & Ramos, 2017). SME leaders should consider ERP implementation as an opportunity to optimize business processes, reduce redundancies and waste, and improve overall company performance. Applying the DOI framework in this study allowed me to explore professional cultures and organizational contexts within SMEs when owners implement cloud-based ERP solutions. Moreover, I applied the business process management design from Six Sigma as a possible means to portray the successful implementation of cloud ERP solutions by improving business performance and growth.

Operational Definitions

Change management: Change management is the set of processes, tools, and techniques to manage change in project plans, business strategies, or company objectives and goals (Stouten, Rousseau, & De Cremer, 2018).

Cloud computing: Cloud computing is shared pools of computer resources, software, and IT services that users can rapidly use and implement over the Internet with minimal management effort or supplier interaction (Botta, de Donato, Persico, & Pescapé, 2016).

Enterprise resource planning (ERP) system: An ERP system is an integrated software solution consisting of modules developed to automate and support the different business processes in all departments within an organization (Alkhaffaf, Jarrah, Karadsheh, & Alhawari, 2018).

Key performance indicator (KPI): A KPI is a quantifiable metric measured to analyze and evaluate the success of an organization, department, project, or people in achieving performance targets and objectives (Salim et al., 2015).

Supply chain management (SCM): SCM is the business processes required to plan, control, and implement the flow of products or services from procuring raw materials, production, and marketing through distribution to the final consumer (Saber, Bahraami, & Haery, 2014).

Assumptions, Limitations, and Delimitations

Assumptions

Assumptions are aspects of research generally assumed to be true without the need for clear proofs (Marshall & Rossman, 2015). The following assumptions impacted this study. The first assumption was that participants answered the interview questions honestly and candidly. The second assumption was that participants knew details about their companies and understood the overall business and were responsible for their company's performance and growth. The third assumption was participants allowed sufficient time to provide detailed responses. The fourth assumption was that the sample was appropriate to address the research problem. The last assumption was that the sample size was sufficient to answer the research question.

Limitations

Limitations are factors and conditions beyond the control of the researcher (Yin, 2018). In this study, the first limitation was related to the study sample size of four SME owners. Findings from such a small number of participants are not generalizable (M. N. K. Saunders & Townsend, 2016); hence, the cloud-based ERP implementation strategies participants identify might not apply to all SMEs operating in Lebanon. Second, the results of this study were limited by the honesty and thoroughness of participants' responses. Third, the participants' availability to respond to interview questions in sufficient detail might limit the results of the study. Fourth, the results might be limited by the participants' knowledge of the subject. The last limitation was the availability of documentation to support the participants' interview responses may limit the results of the study.

Delimitations

Delimitations are the time, location, scope, and context boundaries that a researcher sets for a qualitative study (Yin, 2018). Delimitations of this multiple case study involved the geographic location, sample size, and sample group. I studied SMEs operating in Lebanon. I restricted the study to a minimum of four SMEs. Participants were SME owners who implemented cloud-based ERP solutions in their companies to improve performance and growth. The four SMEs had fewer than 50 employees with annual sales less than 3 million USD. Moreover, participants had a minimum of 5 years of experience and 10 to 50 subordinates.

Significance of the Study

The findings of this study might contribute to effective business practices by conveying how fostering technological adoption can stimulate businesses' growth while reducing operating expenses. Company leaders who adopt a cloud-based ERP system might reduce infrastructure costs associated with procurement of software, servers, disaster recovery, and other hardware equipment required for on-premise ERP (Bagheri & Shaltooki, 2015). Company leaders could take advantage of the characteristics of cloud computing to reduce IT costs, access ERP data and reports from any device, and ensure business continuity (Ganesh & Mehta, 2016).

The results of this study might help SME leaders explore strategies to adopt and implement cloud-based ERP solutions successfully to improve company performance and growth. SME leaders implementing cloud-based ERP software could have more control and flexibility over technology to reduce costs and focus resources on core business activities to achieve a competitive advantage (Weng & Hung, 2014). Hence, cloud-based ERP implementation is one of the successful strategies for SMEs to increase performance and company growth.

SMEs enhance competition and entrepreneurship and contribute several external benefits to economy-wide efficiency, innovation, and social change. As more SMEs adopt cloud-based ERP solutions, SMEs can grow, and an increase in employment and incomes in local communities may contribute to a more economically empowered and enabled local population, which may reduce poverty (Maksimov, Wang, & Luo, 2017). Moreover, cloud computing reduces the technological impact on the environment through

resource virtualization, emission savings, substitution of high carbon physical products with virtual equivalents, and improving energy efficiency (Di Salvo, Agostinho, Almeida, & Giannetti, 2017). Hence, the implications of the proposed study for positive social change included providing stable job opportunities, reducing poverty in Lebanon through economic growth, and reducing the environmental consequences of computing.

A Review of the Professional and Academic Literature

ERP solutions in the corporate world are increasingly becoming a core resource for promoting competitive business advantages of organizations (Saeed et al., 2017). Cloud-based ERP systems have emerged as alternatives to traditional ERPs (Savla & Churi, 2019). However, SME owners fail at a rate of 65% to 70% in successfully adopting and using a cloud-based ERP system (Saeed et al., 2017). The objective of this study was to explore the strategies that SME business owners use to implement cloud-based ERP solutions successfully.

In this literature review, I explain DOI theory and Six Sigma, which comprise the conceptual frameworks for this study. Also, I present a review of rival theories that I considered but chose not to use. Next, I discuss the SME landscape, advantages and disadvantages of cloud computing, ERP solutions, ways to enhance company performance with ERP systems, a comparison of cloud-based and on-premise ERPs, and implementation strategies for cloud-based ERP systems.

To research literature about this topic, I searched peer-reviewed journals, non-peer-reviewed journals, scholarly books, and publications from government agencies. I searched for relevant scholarly articles and books using Google Scholar and the Walden

University Library. Through the library, I searched the following databases: ABI/Inform, Business Source Complete, Emerald Insight, SAGE Premier, Taylor and Francis Online, IEEE Xplore Digital Library, ScienceDirect, and ProQuest Central Database. I conducted searches using the following key words: *ERP*, *cloud computing*, *ERP critical success factors*, *enterprise resource planning*, *improving SME performance using the cloud*, *SME growth and performance*, *cloud computing advantages, Six Sigma implementation with cloud-based ERP, ERP post-implementation strategies, performance monitoring using ERP*, and *cloud-based ERP implementation strategies*. The literature review included 167 references, of which 158 (94%) are peer-reviewed articles. This literature review contains 155 (93%) references that were published in the last 5 years.

DOI

Researchers use DOI theory to identify and understand the methods and strategies needed for an innovation to gain momentum and diffuse through a specific population or social system (Raynard, 2017; X. Wang, Yuen, Wong, & Teo, 2018). The end result of innovation diffusion is that people adopt an innovation and integrate it into organizations or social systems (Rogers, 1962). Innovation adoption means that a person replaces a current process, product, or behavior with an innovation in the form of a new process, product, or behavior (Damanpour, Sanchez-Henriquez, & Chiu, 2018). Researchers applied DOI theory to develop models for technology diffusion, such as the technological-organizational-environmental (TOE) framework (Tornatzky & Fleischer, 1990). I used the DOI theory as the approach to explore SME owners' adoption strategies of cloud-based ERP solutions.

The DOI theory consists of four main elements: innovation, communication via channels, time duration, and social system constituency (Rogers, 1962). Innovation is any product, concept, or practice that adopters view as new and desirable to adapt (Franceschinis et al., 2017). The second element in the DOI framework is the communication channels used in the process of creating and sharing information between participants (Rogers, 1962). The third element is the time duration, which involves the amount of time needed for innovation diffusion (Rogers, 1962). The social system is a set of integrated components managed by people involved in solving a problem to achieve a common goal (Dearing & Cox, 2018). By attending to these four elements, researchers can analyze and discuss strategies to accelerate the diffusion and adoption of an innovation.

To better understand the adoption of innovations, researchers may assess how various groups adopt an innovation. Rogers (1962) defined five established categories of adopters: (a) innovators, (b) early adopters, (c) early majority, (d) late majority, and (e) laggards. Innovators are the people who are interested in new ideas who want to try an innovation first and are willing to take the associated risks. Early adopters are leaders who search for change opportunities to improve social systems. Strategies to appeal to this population include instructions on how to use an innovation and detailed information regarding aspects of an innovation (Wells & Nieuwenhuis, 2018). Early majority adopters are people who want to adopt new ideas but want to see evidence that an innovation works before adopting it. Strategies to appeal to this population include showcasing success stories and proof of the innovation's effectiveness (Franceschinis et

al., 2017). Late majority adopters are people who resist change and will only adopt an innovation after a majority has proved that it is successful. Strategies to appeal to this population include statistics regarding the number of adopters who have successfully used and benefited from the innovation (Lien & Jiang, 2017). Finally, laggards are very resistant to change. Strategies to appeal to this group include statistics and pressure from people in other adopter groups (Franceschinis et al., 2017).

Researchers have explored the perceived attributes of innovation to assess how, why, and at what rate business owners adopt an innovation (Elmustapha, Hoppe, & Bressers, 2018; Kasperavičiūtė-Černiauskienė & Serafinas, 2018). Rogers (2003) distilled the factors that influence the adoption of innovation into five perceived attributes: (a) relative advantage, (b) compatibility, (c) complexity, (d) trialability, and (e) observability. Researchers can use the relative advantage attribute to assess how an innovation improves business leaders' current situation. Company leaders can adopt innovation to enhance company performance by optimizing supply chain management and operational processes (Garcia-Morales, Martín-Rojas, & Lardón-López, 2018; Yadegaridehkordi et al., 2018). Compatibility refers to the innovation's compatibility with current processes or culture of individuals adopting the change (Rogers, 2003). Complexity is the level of difficulty potential adopters encounter in learning to use an innovation (Rogers, 2003). Trialability refers to how easily potential adopters can explore and try an innovation before adopting it (Dearing & Cox, 2018). Observability is the extent to which results or benefits of using an innovation are visible to potential adopters

(Rogers, 2003). Researchers have used the perceived attributes of DOI to predict rates of adoption and discuss innovation adoption strategies in different fields.

Rogers (2003) explained that innovation adoption starts with the innovation-decision process. The innovation-decision process involves activities by which individuals seek and process information concerning the innovation. Company leaders use information-seeking and information-processing activities to reduce uncertainties about the benefits and challenges of an innovation. Rogers define five sequential stages in the innovation-decision process: (a) knowledge, (b) persuasion, (c) decision, (d) implementation, and (e) confirmation.

In the knowledge stage, an individual learns that an innovation exists and searches for information regarding characteristics, functioning principles, and use of the innovation (Mohammadi, Poursaberi, & Salahshoor, 2017). The persuasion stage occurs when an individual formulates a positive or negative attitude toward the innovation (Rogers, 2003). An individual formulates an opinion about the innovation after exploring the degree of uncertainty about the innovation's functioning, success stories, and social reinforcement from others (Mohammadi et al., 2017). During the decision stage, the individual chooses to adopt or reject the innovation. The individual bases their decisions on the aspects of the innovation (Rogers, 2003). For example, when the innovation has the trialability aspect and individuals can easily explore the innovation before adoption, an individual can adopt the innovation faster. At the implementation stage, an individual implements and integrates the innovation (Rogers, 2003). The requirements for the implementation stage are technical assistance, risk management, and change

management. In the confirmation stage, an individual seeks information to support the decision to adopt the innovation, such as measures of success and improvements (Mohammadi et al., 2017). Researchers can use the five stages of DOI to explain how company leaders adopt, reject, or abandon an innovation.

Researchers have used DOI to explore the adoption of new technologies such as cloud computing and ERP solutions in organizations (Junior, Oliveira, & Yanaze, 2019; Maqueira-Marín, Bruque-Cámara, & Minguela-Rata, 2017; Pathan et al., 2017). Similarly, I can use DOI in this study to assess the benefits of cloud-based ERP computing to SMEs and determine the factors influencing the adoption decision of cloud-based computing for SME leaders. Moreover, I used DOI to analyze the impact of perceived attributes of innovation to adopt cloud computing and explore successful strategies for SME leaders to adopt and implement cloud-based ERP solutions successfully.

Six Sigma

In 1986, leaders of Motorola developed a quality management approach called the Six Sigma method of process improvement (Chen et al., 2017). Company leaders can use Six Sigma as an approach to improve business processes continuously and monitor products or services quality (Cudney, Venuthurumilli, Materla, & Antony, 2020; Laureani & Antony, 2019). Six Sigma is a well-structured strategic company-wide approach that has the potential of simultaneously reducing cost and increasing customer satisfaction (Chen et al., 2017). Company leaders incorporating Six Sigma methods can develop a quality management system to define quality goals and process key

performance indicators (KPIs) and quality control procedures to detect areas of improvement and evaluate overall performance (Westgard & Westgard, 2017).

Company leaders are expanding the focus of quality from production to customer satisfaction and efficiency in key business functions of operations, finance, accounting, production, procurement, and human resource processes (Khan, Kaviani, Galli, & Ishtiaq, 2019). The Six Sigma method involves establishing a continuous improvement process through methods such as define-measure-analyze-improve-control DMAIC (Simanová, Sujová, & Gejdoš, 2019). DMAIC is a structured problem-solving method with five stages (Abhilash & Thakkar, 2019). The first stage is the definition of a problem such as defects produced by a process. The second stage is establishing the metrics for the defined problem. The analysis stage is the third phase, wherein company leaders collect data to identify the root causes of the problem. The fourth stage is the implementation of improvement solutions that solve the root problems. Finally, company leaders control the effectiveness of the implemented solutions by applying performance metrics in the fifth phase (Abhilash & Thakkar, 2019).

When implementing an ERP solution, company leaders may identify opportunities to improve business processes using Six Sigma techniques (Leu & Lee, 2017). Company leaders require a clear methodology to support ERP implementation and ensure the effectiveness of an ERP solution. Company leaders should measure current baseline operational performance and remeasure performance metrics after finalizing the implementation of an ERP solution to realize the benefits of ERP implementation (Zaini & Saad, 2019). Using Six Sigma tools and methods, company leaders can define areas of

improvements to select the suitable ERP solution and understand the effectiveness of

ERP implementation by understanding performance improvement.

I used Six Sigma to explore the elements of successful cloud-based ERP

implementation strategies. The ERP implementation strategy will involve the five stages

of DMAIC: problem definition, selecting performance metrics, analyzing performance

data, implementing the new system, and controlling the effectiveness of the solution. The

results of successfully implementing cloud-based ERP strategies in a company could

show improvement in customer satisfaction, enhanced operational efficiency, and

achieving a competitive advantage.

Rival Theories

I considered two rival theories as the conceptual framework for this study: the

dynamic capabilities framework (DCF) and TOE framework. DCF and TOE are two

frameworks that researchers use to explore adoption and implementation of technology

innovation to solve organizational problems or achieve strategic goals. I provided below

a description of DCF and TOE theories and how they compare with DOI.

Teece, Pisano, and Shuen (1997) developed DCF as a theory to explore

competitive advantage strategies for companies. The fundamental principle of the DCF is

that acquiring and implementing company-specific capabilities could be a source of

competitive advantage for companies operating under rapidly changing market

conditions. The key concepts of the DCF are managerial and organizational capabilities

and processes relating to (a) coordination, (b) training, and (c) transformation (Teece et

al., 1997). Teece (2007) extended the key concepts of dynamic capabilities to include the

capacities for (a) sensing and shaping opportunities and threats; (b) seizing opportunities; and (c) adapting, configuring, and reconfiguring the organization's tangible and intangible assets to achieve competitive advantage. Dynamic capabilities are useful in managing changing environments and disruptive innovation because they assist leaders in adapting and transforming a company's operational capabilities into new dynamic capabilities that could respond to the changing environment (Helfat & Raubitschek, 2018). DCF can reflect the capacity of a company to proactively transform and successfully adapt to changes in the business environment (Teece, 2007). Because DCF is a framework for exploring strategies by which company leaders acquire and implement company-specific capabilities, using DCF for this study would have been inappropriate. Using DOI was insightful when exploring how SME owners can implement cloud-based ERP to improve company performance and growth.

The other possible alternative theory was the TOE framework, developed by Tornatzky and Fleischer (1990) which involved exploring how technological, organizational, and environmental factors enable or hinder innovation and adoption of new technologies. Al-Hujran, Al-Lozi, Al-Debei, and Maqableh (2018) used TOE framework to investigate cloud computing adoption by addressing issues beyond the technological context and incorporating organizational and environmental contexts. Previous researchers (e.g., Kumar, Samalia, & Verma, 2017; Senarathna, Wilkin, Warren, Yeoh, & Salzman, 2018) used TOE framework to evaluate the effects of technological, organizational, and environmental factors on IT adoption and diffusion in

SMEs. These studies illustrated the advantages of using TOE framework as a theoretical lens for exploring and analyzing the factors that influence cloud computing adoption.

The TOE framework has some limitations, which made the framework inappropriate for this study. Although the TOE framework offers a wide theoretical lens to study the determinants of cloud-based ERP adoption, one of the limitations of the framework is that it does not address individual factors such as issues relating to the adoption rate of new technologies by users (Shaltoni, 2017). Considering that the objective of this study was not to identify the factors that inhibit or facilitate cloud-based ERP adoption but rather to explore firm-specific strategies SME owners could use to implement cloud-based ERP solutions, using the TOE framework for this study would have been inappropriate. With the conceptual framework in place, the next step was to orient this study within the broad context of SMEs.

Landscape of SMEs

SMEs differ in definition by country and industry. In general, SMEs are enterprises with fewer than 100 employees and annual revenue not exceeding 3 million USD (Loecher, 2000). In the European Union, SMEs are companies with fewer than 250 employees and less than 50 million Euros as annual revenues (European Commission, 2003). The U.S. International Trade Commission (2010) defined SMEs as firms that employ fewer than 500 employees. The United Nations Industrial Development Organization (2005) stated that in developing countries, small enterprise owners employ between 10 and 49 people, and medium-sized enterprise owners employ between 50 and 249.

SMEs are influential to the economy and employment growth. Regardless of their specific definitions, SMEs influence economies more than their counterpart conglomerates and corporations (Lopes de Sousa Jabbour, Ndubisi, & Seles, 2020). In the United States, small businesses employed 58.9 million people, or 47.5% of the private workforce, in 2018 (U.S. Small Business Administration, 2018). Regardless of domain or industry, SME leaders rely on various processes to run their businesses efficiently, including inventory and order management, accounting, human resources (HR), customer relationship management (CRM), and others (Clegg, 2018). The performance of SMEs is proportionate to the performance of their business processes, whether those processes relate to general support functions of the business such as HR, finance, and procurement, or the domain-specific, product or service generation processes that are technical in nature (Anwar, 2018). SME leaders compete to increase the maturity of the operational and business support processes by continuously optimizing and improving processes rather than being reactive.

SME leaders may implement governance to plan strategically and use streamlined technology, to continually improve and optimize performance. SME leaders may need to implement governance to control the increasing size and complexity of operations and supporting business processes (Pillai & Al-Malkawi, 2018). Governance is the framework under which an organization's policies, structure, culture, resources, and processes run efficiently to ensure the achievement of an organization's goals and objectives (Cohen, Stilgoe, & Cavoli, 2018). Company leaders implement governance to operate within a clear and robust framework for decision making and accountability to

achieve a company's strategic plan (Pillai & Al-Malkawi, 2018). SME leaders may also automate the business processes to strengthen governance, enforce business rules, and monitor performance (Nicho, 2018). SME leaders may leverage the capabilities of information technology to streamline the business process effectively to unlock time to focus on core competencies and strategic planning (Park et al., 2017). Moreover, SME leaders seek automation solutions that do not require long implementation cycles and costly resources (Makhlouf & Allal-Chérif, 2019). Cloud solutions such as software-as-a-service present an opportunity for SMEs with lean cash flow and limited human resources. Leveraging information technology using digital transformation and automation enables SME leaders to continuously improve and optimize business processes to create a competitive advantage.

SME owners may incorporate automation in every aspect of the business from digital marketing to customer relationship management to streamlining the supply chain process. When operational processes are automated, SME owners may have time to focus on strategic planning, enhancing performance, and improving company growth. Moreover, SME owners seek automation solutions, such as cloud computing services, which can be implemented rapidly without the need for costly resources or infrastructure.

Cloud Computing

Cloud computing is a model for delivering computing resources as software or hardware over the Internet (Attaran & Woods, 2019). Cloud computing services boost the power of the Internet and create opportunities for companies to lower operating costs with agility and scalability (Kathuria, Mann, Khuntia, Saldanha, & Kauffman, 2018).

Cloud computing contributes to solving organizational problems such as the high costs of implementing, maintaining, and supporting an IT infrastructure that is unlikely to be used at full capacity in the single-owner environment (Joe-Wong & Sen, 2018). Software as a service (SaaS), platform as a service (PaaS), and infrastructure as a service (IaaS) are different models of cloud computing (Mushtaq et al., 2017).

SaaS is a software distribution model where a third-party provider hosts applications and makes them available over the Internet (S. H. Kim, Jang, & Yang, 2017). PaaS is a cloud computing model that delivers application platforms over the cloud (Verba et al., 2017) such as web servers for technical teams to build and run any web application without any server deployment or configuration. IaaS is another form of cloud computing that provides virtualized computing resources over the Internet (Gonzales, Kaplan, Saltzman, Winkelman, & Woods, 2017). SME owners are interested in SaaS technologies and products because there is a need for fast deployment of business software on the cloud without any platform or infrastructure implementation (Otuka, Tawil, & Al-Nemrat, 2017).

Using cloud computing services in companies has the benefits and gains of (a) broad network access, (b) resources pooling, (c) flexibility, and (d) measurement of service (Joe-Wong & Sen, 2018). Company leaders who use cloud computing can focus on innovative service creation while depending on the cloud to adapt to change and scaling demands (Retana, Forman, Narasimhan, Niculescu, & Wu, 2018). The availability and on-demand characteristics of cloud computing enable enterprises to run and coordinate large external workforces and support operational management by relying

on a foundation that is reliable, adaptable, and secure to ensure enterprises can

futureproof their foothold in their markets (Navale & Bourne, 2018). However, cloud

computing has some disadvantages such as information security. In the next two sections,

I discussed in detail the advantages and disadvantages of cloud computing.

      Advantages of cloud computing. Cloud computing presents several

opportunities and benefits for SMEs. SMEs and online businesses may use cloud

computing to create value and decrease operation costs (Attaran & Woods, 2019). In the

case of ERP software, company leaders can subscribe with a cloud ERP vendor to access

an online ERP system without the need to build an on-premise infrastructure of hardware

or software (Savla & Churi, 2019). Organizational leaders adopting cloud-based software

will benefit from infrastructure cost savings, scalability, flexibility, mobility, and reliable

disaster recovery process (Rashid & Chaturvedi, 2019). Several technological and cost-

saving motivators are attracting organizational leaders to adopt cloud-based ERP

solutions (Zadeh, Akinyemi, Jeyaraj, & Zolbanin, 2018).

      SaaS is a cost-effective solution when compared to on-premise systems. The cost

savings in this model occur mainly because of reduced IT infrastructure and IT-related

costs and use of resources (Salim et al., 2015). Also, the SaaS vendor, rather than the

business owner, is responsible for maintenance and system upgrades are also the

responsibility of the SaaS vendor. Energy, hardware maintenance, software upgrades, and

IT staff cost savings are the key advantages of cloud-based ERP (Ke, Yeh, & Su, 2017).

Cost savings are significant and mean that SME owners can divert additional resources to

support other critical aspects of the business such as innovation, product development, and marketing.

SaaS solutions enhance organizational flexibility by offering on-demand IT resources. A cloud vendor charges organizations according to the amount of IT resources they consume, accommodating fluctuations in use (Ke et al., 2017). Moreover, organization leaders get access to an instant supply of IT resources, which offer rapid scalability and elasticity (Ahmad & Andras, 2019). Scalability is a technological motivator for cloud ERP adoption because it allows company leaders to use more IT resources instantly (Zoubeidi et al., 2020). Moreover, SaaS software has the advantage of adapting to mobile use by allowing company employees to access reports and software tools from any device or location (Fisher, 2018). Mobile accessibility allows increased productivity for company employees and promotes the use of innovative trends such as crowdsourcing and outsourcing (Srivastava & Nanath, 2017).

SME owners may seek to implement SaaS solutions such as cloud-based ERP to improve performance and reduce costs (Attaran & Woods, 2019; Rashid & Chaturvedi, 2019). Cloud-based ERP providers can help SME owners to rapidly deploy software to cover the automation of running operations in SMEs (Ahmad & Andras, 2019). The benefits of cloud computing include scalability, lower entry cost, mobility, improved efficiency, and flexibility (Attaran & Woods, 2019; Fisher, 2018; Rashid & Chaturvedi, 2019). The competence and efficiency of the business processes directly impact the businesses in areas such as sales, total assets, and capital investments (Pattanayak, Roy, & Satpathy, 2019).

Disadvantages of cloud computing. There are some disadvantages to cloud computing. Security and limited control are the two main disadvantages of cloud computing (Hashmi, Ranjan, & Anand, 2018). Although most cloud service providers implement high-quality security standards and industry certifications, storing data and business-critical files on external service providers expose them to risks (J. Li, Zhang, Chen, & Xiang, 2018). Several incidents of hacking and unauthorized access to private data on the cloud have occurred, such as the NSA spying scandal in 2013 and the nude photo iCloud hack in 2014 (de Bruin & Floridi, 2017). These incidents inspired hackers to turn increasingly to the cloud (de Bruin & Floridi, 2017); moreover, customers of cloud computing retain control of applications, data, and services, but may not have the same level of control as owners of on-site infrastructures (Yang et al., 2017). For instance, Amazon, a cloud services provider, discontinued the WikiLeaks account on Amazon Web Services cloud services (de Bruin & Floridi, 2017).

Another potential disadvantage is that SME owners might consider the update process to be a risk because ERP users do not know the reasons nor the schedule for the updates of cloud-based systems (Bjelland & Haddara, 2018). The cloud software vendors control and plan the update process of the cloud-based ERP system. The software update likely includes enhanced features and fixing bugs, but cloud-based ERP users lack knowledge regarding the future development of the system and when the system will be updated (Claybaugh, Ramamurthy, & Haseman, 2017). Moreover, users do not decide when updates occur, complicating their ability to accommodate users who might require training on the updated systems (Haddara & Moen, 2017).

Another challenge is the limited customization capabilities of cloud-based ERP solutions (Makki, Van Landuyt, Lagaisse, & Joosen, 2018). The strategy for cloud-based ERP vendors is to design one software for all clients (Rodrigues, Ruivo, Johansson, & Oliveira, 2016). This strategy might affect the ability of business owners to innovate because they need to customize the ERP system based on their unique requirements to achieve a competitive advantage (Olson, Johansson, & De Carvalho, 2018).

Despite the drawbacks, companies are adopting cloud computing for applications such as e-mail, scheduling, human resource management systems, CRM, e-commerce, and other cloud-based software applications (Al-Ruithe, Benkhelifa, & Hameed, 2017). Company leaders have started to realize the advantages of cloud computing and how it can improve the performance of their business and reduce the costs of infrastructure, maintenance, and upgrades (Tarhini, Masa'deh, Al-Badi, Almajali, & Alrabayaah, 2017). Because their control is limited and stored data might not be secure (Sharma, Al-Badi, Govindaluri, & Al-Kharusi, 2016), SMEs need to consider the advantages, disadvantages, and the effects of cloud computing on their organizations and operational procedures before adopting and using it. The benefits outweigh the drawbacks for most organizations, most notably the significant cost saving, scalability, and rapid deployment (Tarhini et al., 2017). Moreover, the key to the successful adoption of cloud computing is the selection of a trusted vendor to make the transition seamless and effective (Botta et al., 2016).

SME owners should consider the challenges of customization, system updates, and security when implementing cloud-based ERP. SME owners should seek cloud-based

ERP vendors with high-security standards and high customization capabilities (Botta et al., 2016). Moreover, cloud computing is a leading driver of emerging technologies, and cloud computing vendors compete to provide better support services, security, and customization features (Rodrigues et al., 2016). This competitive marketplace for cloud-based ERPs establishes a robust atmosphere for SME owners to find a system that fits their needs (Botta et al., 2016).

ERP Solutions

The use of ERP solutions in the corporate world is increasingly becoming a core resource for promoting the competitive business advantage of organizations (Saeed et al., 2017). Cloud-based ERP systems have emerged as an alternative to traditional ERPs (Savla & Churi, 2019). Cloud-based ERP providers assert that adoption requires low upfront investments, and services can be rapidly deployed over the cloud (Zadeh et al., 2018). However, the successful implementation of cloud-based ERP systems remains a challenging engagement for most organizations (Tian & Xu, 2015).

The ERP software market is the largest of business applications in software markets (Poba-Nzaou, Raymond, & Fabi, 2014). ERP systems may be the most popular new business software since 1999, with more than 200 ERP systems providers in existence (Ali & Cullinane, 2014). Organizational leaders adopt and implement ERP software to streamline the business processes in different sectors such as manufacturing, retail, and services (Soler, Feliks, & Ömürgönülşen, 2016). Due to the large investments required to procure and implement ERP systems, countries with higher economic rankings have the highest sales of ERP systems and implementation rates, as reported by

several researchers (Bahari, Yonnedi, & Djunid, 2015; Ram & Corkindale, 2014). North America maintains 66% of the ERP market followed by Europe's 22% and Asia's 9% market share (Ram & Corkindale, 2014).

Several advantages occur with adopting an ERP solution, as business owners seek new tools and techniques to optimize business processes and improve business performance (Egdair, Rajemi, & Nadarajan, 2015). Business owners adopt ERP solutions to understand business data, avoid process redundancy, reduce waste, decrease cycle time, and improve operational efficiency (Mann, Kumar, Kumar, & Mann, 2017). Company leaders benefit from ERP systems by monitoring and reducing operational costs, enhancing response times, integrating processes, and viewing the performance of each process (Acar, Tarim, Zaim, Zaim, & Delen, 2017). Hence, business owners can use ERP systems to streamline and integrate critical business processes across the value chain to enhance business performance (Egdair et al., 2015).

Implementations of ERP systems in companies precipitate changes in the business processes, structures, and communication methods and techniques (Al-Taweel & Haithm, 2016). An integrated ERP system enables interactions between representatives of marketing, sales, production, and quality control. SME leaders use ERP systems to integrate all departments and functions across a company and reduce administrative and operating costs (Rodrigues et al., 2016). Moreover, implementing an ERP system can enhance top management decision-making processes by offering real-time access to accurate data (Govindaraju, Dwipayana, & Salamah, 2018).

ERP adoption has a positive impact on visibility, quality, and control of information, which in turn lead to an enhanced decision-making process (Govindaraju et al., 2018). SME owners who implement ERP systems reap improved productivity and long-term cost reduction (Mann et al., 2017). Implementation of ERP systems can streamline a company's business processes and increase operational efficiency (Egdair et al., 2015). The exploitation of ERP systems may help SMEs to survive, prosper, and achieve future growth and expansion plans.

Enhancing company performance with ERP systems. Researchers are interested in the relationship between ERP systems and organizational performance (Hasan, Ebrahim, Mahmood, & Rahman, 2017; Jenab, Staub, Moslehpour, & Wu, 2019; Rouhani & Mehri, 2018). Some company leaders are investing in ERP systems to measure the performance of different supply chain processes and to control costs and quality (Acar, Zaim, Isik, & Calisir, 2017; Dzenopoljac, Yaacoub, Elkanj, & Bontis, 2017; Grant & Yeo, 2018). Company performance measurement plays a role in organizational growth (Nason & Wiklund, 2018). Through measuring performance, company leaders can monitor and track progress against strategic goals, identify opportunities for improvement, compare performance against competition (Kokina, Pachamanova, & Corbett, 2017), and develop strategic activities (Vieira, O'Dwyer, & Schneider, 2017).

Company leaders may also implement ERP systems to automate business processes and consolidate data collected from different processes and departments into one logical database (Ali & Miller, 2017). Therefore, an ERP system allows leaders to

keep track of all business transactions, financial data, and resources and to generate

accurate reports to plan and monitor performance (Badewi, Shehab, Zeng, & Mohamad,

2018). The reports generated from an ERP system allow company leaders to improve

financial planning, predict consumer demands, and appropriately allocate resources

(Hosseinzadeh & Davari, 2018). Company leaders may be able to monitor performance

and eliminate oversights and errors using the ERP system's consolidated data (Machado

& Gomes, 2018).

Another capability of ERP systems is to integrate the different facets of the supply

chain, such as inventory, sales, manufacturing, logistics, and other supporting operations

(Randhawa & Sethi, 2017). Company leaders can use an integrated ERP system to collect

and analyze real-time information to monitor performance and optimize processes (Apiyo

& Kiarie, 2018). Process optimization includes removing redundant processes, reducing

cycle time, and enhancing consumer demand forecasting techniques (Acar, Zaim, et al.,

2017). Implementing an ERP system may provide company leaders with a centralized

view of the supply chain's key performance indicators for monitoring all aspects of the

processes (Dzenopoljac et al., 2017). Using automated key performance indicators,

company leaders can monitor performance measures, identify areas that need

improvement, and assess the functional areas' alignment with the company's strategy

(Maté, Trujillo, & Mylopoulos, 2017).

Moreover, company leaders can use ERP systems to test different scenarios to

decide how to adjust strategies to address the various changes in the market and

consumer demand in a company's strategy (Appelbaum, Kogan, Vasarhelyi, & Yan,

2017). Company leaders may improve company performance by implementing ERP systems to monitor overall performance and highlight areas of improvement by bridging information gaps (Ali & Miller, 2017; Jenab et al., 2019). Moreover, company leaders can integrate ERP system databases with business intelligence tools like decision-support systems, data-mining, and early-warning systems enabling management to make better decisions and improve business processes (Sun, Sun, & Strang, 2018).

With an ERP system, company leaders can leverage advanced features and functionality to improve all aspects of a company's operations from product development, sourcing and procurement, through manufacturing, quality testing, and delivery (Ali & Miller, 2017; Jenab et al., 2019). Hence, company leaders can enhance efficiency and profitability by reducing cost, responding to customer demand, and improving delivery and quality (Jenab et al., 2019; Rouhani & Mehri, 2018). Accordingly, information access, process improvement, and product innovation are unique capabilities that contribute to creating and sustaining a company's competitive advantage (Apiyo & Kiarie, 2018).

Comparing cloud-based ERP with on-premise ERP. On-premise ERP systems run on an on-site infrastructure managed by a team in a company (Zhao & Kirche, 2018). The costs usually involve purchasing a perpetual software license with service level agreements (Fisher, 2018). Also, business leaders can determine and plan software upgrades and customizations when using on-premise ERP (Claybaugh et al., 2017). On the other hand, a cloud-based ERP system is an application of a SaaS wherein a provider hosts the ERP off-site and is responsible for the software installation, configuration, and

the infrastructure (Bjelland & Haddara, 2018). Cloud-based ERP solutions are off-site,

have subscription-based payment terms, and are subject to mandatory upgrades as

scheduled by the ERP vendor (S. Gupta, Misra, Singh, Kumar, & Kumar, 2017).

Costs are a key aspect to consider when comparing cloud-based ERP and on-

premise ERP. On-premise ERP may incur higher up-front costs than cloud-based ERP

(Nayar & Kumar, 2018). Companies generally pay for all software licenses for an on-

premise system at once, unlike with a cloud-based ERP SaaS model. On-premise

solutions include infrastructure costs and maintenance fees for the vendor to support and

maintain the system (Nayar & Kumar, 2018). SaaS providers offer cloud solutions on a

monthly subscription, which includes all infrastructure costs and product support costs

(Bjelland & Haddara, 2018). Hence, on-premise ERP system costs are a form of capital

expenditure with one large investment upfront, while cloud-based ERP system costs are a

form of operating expenditure.

Company leaders can benefit from the instant provisioning of cloud-based ERP

solutions (Fisher, 2018). On-premise ERP requires configuration, installation, and

scheduled upgrades (Srivastava & Nanath, 2017). Cloud-based ERP, by contrast, are

already configured and ready for users to access (Luo, Zhang, Bose, Li, & Chung, 2018).

Moreover, users can easily scale up and down cloud-based ERP, depending on a

company's business needs (Priya, Sangaiah, Thangavelu, Murali, & Balusamy, 2017).

Cloud-based solutions automatically upgrade without the need for a company's IT

personnel to provision upgrade installation (S. Gupta et al., 2017). On-premise upgrades

and new releases require buying the upgrade package or paying for specialized services to get the software update (Zhao & Kirche, 2018).

On-premise ERP systems require a costly investment, resources, and time to procure, install, and manage the deployment and configuration of the software and the related servers, databases, and licenses (S. Gupta, Misra, Kock, & Roubaud, 2018). On-premise systems require that a company's IT team spends time in training and ensuring that the system is functioning properly, including maintenance of hardware, servers, and databases (Hasheela-Mufeti & Smolander, 2017). For cloud-based ERP systems, the cloud ERP provider hosts and maintains the entire IT infrastructure and ensures the system is always running, and upgrades roll out seamlessly (Srivastava & Nanath, 2017). The total cost of ownership of on-premise ERP solutions is high compared to cloud systems (Espinoza, Brooks, & Araujo, 2018). Moreover, if a third party attends to maintaining the ERP system, company leaders can focus on a company's core competencies, innovate, and grow the business (Srivastava & Nanath, 2017).

Company leaders implementing cloud-based ERP solutions reduce the total cost of ownership and increase the return on investment involved in purchasing ERP software (Espinoza et al., 2018). Company leaders can leverage the speed of cloud-based ERP deployment with minimum lead time and implementation duration (Luo et al., 2018). Moreover, the scalability of cloud-based ERPs proves more beneficial for small and medium enterprises than on-premise ERPs which require additional IT resources to scale up or down (Priya et al., 2017). Another aspect business owners must consider is methods of implementing cloud-based ERP systems.

Implementation of Cloud-Based ERP Systems

Several researchers contributed to business practice by discussing different ERP implementation strategies based on ERP technology, size of the organization, and business type (Al-Sabri, Al-Mashari, & Chikh, 2018; H. J. Li, Chang, & Yen, 2017; Nagpal, Kumar, & Khatri, 2018). In the technological context, ERP strategies are comprised of (a) a technical implementation plan, (b) training plan, and (c) data migration plan (Parthasarathy & Sharma, 2016). Company leaders can use the *big bang approach* or a phased approach for the technical implementation plan (Ali & Miller, 2017).

The big bang approach involves switching all operations to the newly deployed ERP system on a go-live day in one phase (Kofahi & Alryalat, 2017). On the other hand, the phased approach is a systematic rollout of different modules while keeping legacy systems operational to minimize risks (Hadidi, Assaf, & Alkhiami, 2017). Implementing a training plan plays a role in the user acceptance of the new ERP system users and in streamlining the current operations on the new system (Motahar, Mukhtar, Safie, Ma'arif, & Mostafavi, 2018). Data migration is the technical process of transferring data from the previous ERP system to the newly deployed system (Al-Sabri et al., 2018). Company leaders should identify the technical approach for deployment, training requirements, and critical data that needs to be transferred and data to archive and keep in the old system.

For a successful ERP implementation, company leaders should adopt a cloud-based ERP implementation strategy and consider (a) strategic planning, (b) top management support, (c) software selection, (d) consultant selection, (e) project

management, (f) change management, and (g) user involvement (Al-Zoubi & Al-Haija, 2018; Comuzzi & Parhizkar, 2017; Liao, Huang, & Lin, 2018). The objective of a strategic plan is to connect the vision of the ERP implementation with the potential business gains of an organization and mitigate the implementation process risks (Dezdar, 2017). Strategic implementation is essential for business leaders to alleviate the potential problems of implementation. The main factors in implementing a successful strategy are (a) the alignment of business processes to the strategic plan, (b) intra-organization communications, and (c) the role of middle managers (Demi & Haddara, 2018).

Company leaders aim to align the business processes with the organizational strategic plan using the ERP system (Luftman, Lyytinen, & ben Zvi, 2017). This alignment is likely to ensure that a company's operational resources serve the mission and objectives as expressed in the strategic plan (J. Wang & Rusu, 2018). Moreover, company leaders can use the alignment process to review departmental goals and objectives and discover implementation gaps (McAdam, Bititci, & Galbraith, 2017). Company leaders may map the objectives to business processes rather than to departments to increase the efficiency of processes (Luftman et al., 2017). The implementation of an ERP system should standardize processes within an organization and measure processes efficiency (Rao & Kumar, 2017). Hence, company leaders can take advantage of ERP implementation to establish process measures and align the business performance measures with process-level measures.

Securing the support of top management for the ERP implementation by providing adequate resources for the process is critical to the success of an ERP adoption

(Shao, Feng, & Hu, 2017). When top managers are committed, they provide the needed resources to finish a project and manage resources to control budget overruns, scope changes, and schedule delays (Amoako-Gyampah, Meredith, & Loyd, 2018). Moreover, ERP implementation projects may require re-engineering of some business processes, and changes in processes require the acceptance and assurance of company leaders to influence the roles of project stakeholders to work toward successful implementation (Kulkarni, Robles-Flores, & Popovič, 2017). Top managers' commitment to the project ensures the alignment of the strategic plan with the ERP implementation project.

In ERP implementation projects, communication is critical to mitigating resistance to change and ensuring a high adoption rate (Bueno & Gallego, 2017). Top managers should communicate the importance of the project, the goals and objectives, and the progress of the project to employees and other stakeholders (Y. Li, Wu, Zong, & Li, 2017). Top managers should implement a communication plan in ERP implementation projects to facilitate successful implementation and achieve the planned objectives (Jagoda & Samaranayake, 2017). Establishing a communication plan reduces the risks of user resistance and keeps managers informed about the project's progress (Mamoghli, Goepp, & Botta-Genoulaz, 2018). A strong communication system supports leaders' ability to consider all of an organization's needs as they select and implement the new ERP system.

Company leaders should select appropriate cloud-based ERP software to reduce the risk of failure of the ERP implementation (Jituri, Fleck, & Ahmad, 2018). For example, selecting ERP products based on state-of-the-art but immature technologies and

might result in a failed implementation (Garg & Khurana, 2017). Company leaders

should select a provider based on criteria of cost-benefit ration analysis, the provider's

experience and references, and service level agreements (Branco, de Sá-Soares, &

Rivero, 2017). Moreover, during the selection process, company leaders should consider

which features the organization requires and which of those features the provider's ERP

will provide (Ogunrinde, Jusoh, Pa, Rahman, & Abdullah, 2017).

Project management is another factor to consider in ERP implementation to

manage resources, activities, scheduling, budget, and risks (Liao et al., 2018). An ERP

project manager must understand the impact of the ERP implementation project on the

business processes, and work with business managers to ensure a smooth transition from

the current situation to the ERP operating environment (Amalnik & Ravasan, 2018). An

ERP project manager can manage the project scope, schedule, resources, and risks.

Moreover, top managers clearly define success criteria for ERP implantation, and a

project manager monitors these criteria throughout the project (Zerbino et al., 2017).

Hence, a project manager measures the quality of performance expected from the new

system and adjusts the performance criteria throughout the project's lifecycle.

Furthermore, SME leaders should consider a change management strategy to

ensure a smooth transition to the cloud-based ERP throughout a company. A change

management strategy sustains the relationships between employees, processes, and

systems to ensure that employees understand the business process changes and receive

the necessary training to use the new system (Comuzzi & Parhizkar, 2017). A change

management strategy should consist of three phases: (a) change preparation, in which

company leaders assess organizational readiness and prepare communication and training plans (Badewi & Shehab, 2016); (b) change implementation, in which leaders implement change by managing organizational leadership, user communications, and training (Misra, Bisui, & Mahapatra, 2018); and (c) measurement of user impact, in which company leaders measure the changes by surveying users and applying lessons learned from the previous phases (Jayatilleke & Lai, 2018).

The impact of user involvement on a successful ERP implementation project is an area of interest to researchers (Bano, Zowghi, & da Rimini, 2017; Bhattacharya, Wamba, & Kamdjoug, 2019; Menon, Muchnick, Butler, & Pizur, 2019; Osman & Sahraoui, 2018). Company leaders should consider user involvement in two phases: defining ERP implementation requirements and the ERP implementation phase (Bhattacharya et al., 2019; Menon et al., 2019). Users know the business processes related to their functional units and are familiar with the knowledge domain in their departments. Company leaders should involve users in the requirements definition phase to prioritize the ERP implementation based on functional priorities and related business processes. During the ERP implementation phase, user involvement is required to confirm the correct implementation of the current business processes in the ERP system (Bano et al., 2017). ERP implementation may require changing and optimizing of business processes to be fully integrated (Luftman et al., 2017). Company leaders may involve users to guide and accept the business processes changes for a successful ERP implementation (Dobrovič, & Timková, 2017).

In summary, company leaders aim to develop and implement a cloud-based ERP implementation strategy that includes the following considerations: (a) strategic planning, (b) top management support, (c) software selection, (d) consultant selection, (e) project management, (f) change management, and (g) user involvement (Al-Zoubi & Al-Haija, 2018; Comuzzi & Parhizkar, 2017; Liao et al., 2018). Company leaders must align the business processes and the organizational strategic plan with the ERP implementation strategy (Luftman et al., 2017). Leaders must also anticipate and prepare to navigate the challenges associated with the adoption of the new system (Comuzzi & Parhizkar, 2017).

Challenges to Implementation of Cloud-Based ERP Systems

SME leaders are investing in cloud-based ERP systems to improve processes and reduce operational costs. The implementation of an ERP system is not always simple, and company leaders may face challenges depending on their organizational situations and selection of ERP vendor (Jituri et al., 2018; Menon et al., 2019). The challenges in implementing a cloud-based ERP solution differ depending on whether company leaders implement a cloud-based ERP from scratch or migrate from an existing on-premise solution to the cloud (Fahmideh & Beydoun, 2018). The potential challenges are (a) customizations, (b) organizational issues, (c) costs, (d) data security, and (e) strategic risks (Alsharari, Al-Shboul, & Alteneiji, 2020; S. Gupta et al., 2017).

Cloud-based ERP systems are easier to deploy and adopt than on-premise ERPs, but they are difficult to customize or tailor to a company's specific business requirements (Alsharari et al., 2020). Customization can increase the cost of the ERP implementation, and SME leaders must balance the cost against the need for customization (S. Gupta,

Misra, et al., 2018). The goal is to choose a cloud-based ERP vendor to provide ERP features and functionalities that match the business and functional requirements of the SME (Ogunrinde et al., 2017). SME leaders should select a cloud-based ERP system with the ability for users to configure SME business requirements during implementation without the need for customizing or changing the source code.

Configuration does not involve changing source codes, but company leaders can configure the system during implementation to support customization of application functionality within a predefined scope such as adding new data fields, creating new input forms, modifying process workflows, adjusting business rules, and creating reports and dashboards (Ibrahim, Duraisamy, & Sridevi, 2019). SME leaders should avoid customizations that lead to source code changes but choose a solution wherein users can configure to match the business and functional requirements without asking the solution provider to do source code changes (Sørheller et al., 2018).

Company leaders also face organizational challenges during the process of implementing cloud ERP (Singh, 2018). Poor involvement by managers, poor change management, and poor cross-functional communication are three organizational challenges that may impact implementation (Al-Zoubi & Al-Haija, 2018). Company managers should oversee the entire project and ensure that all departments and functional teams are involved and available during the implementation (Khan, Keung, Hussain, Niazi, & Tamimy, 2017). Other ways to navigate these challenges include setting priorities and realistic deadlines for the resources. Also, establishing a change management procedure and communication plan to validate the implementation, collect

end users' feedback, requests, and requirements, and ensure cross-functional communication between the different stakeholders (Al-Zoubi & Al-Haija, 2018) may mitigate the impact of complications.

Another challenge is the cost of migrating from on-premise ERP to cloud-based ERP (Espinoza et al., 2018). Long-term costs of cloud-based ERP with annual or monthly subscription costs may add up over the time to more than the maintenance costs of the current on-premise ERP (Nayar & Kumar, 2018). However, the subscription cost model has the benefit of freeing company leaders from paying for any IT infrastructure and hardware costs (Fisher, 2018). Therefore, SME leaders should decide to migrate from on-premise ERP to cloud-based ERP, considering that the long-term operating cost of cloud-based ERP are not more than the costs of running an on-premise ERP system.

Data security risks are an inherent risk in cloud-based computing, and SME leaders must consider how to prevent unauthorized use of data and ensure data ownership (Saa, Costales, Moscoso-Zea, & Lujan-Mora, 2017). Cloud-based ERP vendors may implement a multi-layered security strategy to protect data and secure access (Kumar & Goyal, 2019). Vendors should also provide complete monitoring and timely alerts regarding security issues that might compromise sensitive systems or data (Grzonka, Jakóbik, Kołodziej, & Pllana, 2018). SME leaders are responsible for taking proactive measures to ensure the cloud provider's data security policies and procedures are sufficient to secure the confidentiality and integrity of sensitive corporate data (Ogunrinde et al., 2017). SME leaders should ensure that cloud ERP data is securely

backed up and that cloud ERP vendors offer data extraction from the cloud to a local network (Meghana, Mathew, & Rodrigues, 2018).

Depending on the IT infrastructure and support of cloud providers is a strategic risk for SME leaders (Liu, Chan, Yang, & Niu, 2018). SME leaders might lose existing IT competencies in companies because the cloud ERP provider is managing and supporting the IT infrastructure, software, and data back-ups (Lee, 2019). SME leaders may also face resistance from the company's IT departments toward organizational changes during the implementation phase. SME leaders should start the implementation by selecting a suitable cloud-based ERP provider after checking the provider's position in the market. Also, SME leaders should consider the financial background, reliability, experience, prices, and user reviews before selecting the vendor to mitigate internal resistance (Kanchana & Sriranjini, 2018).

Benefits of implementing cloud-based ERP include reductions in IT costs, enhanced scalability, improved accessibility, and rapid system implementation (Espinoza et al., 2018; Luo et al., 2018). However, company leaders must also evaluate the challenges of implementing cloud-based ERP systems and balance those benefits and challenges (Menon et al., 2019). SME leaders may overcome the challenges by selecting a suitable cloud vendor, ensuring top management involvement, implementing change management processes, enforcing user involvement, and enabling cross-functional communication (S. Gupta et al., 2017; Jituri et al., 2018; Menon et al., 2019).

Transition

In this qualitative multiple case study, I explored strategies necessary for successfully implementing cloud-based ERP systems in SMEs. Section 1 contained background information relating to cloud-based ERP solutions. Company leaders can use ERP systems to integrate supply chain operations and streamline business processes to improve company performance and growth (Egdair et al., 2015). SME leaders work to adopt an ERP implementation strategy to achieve the goals and objectives of automating a company's processes using ERP (Comuzzi & Parhizkar, 2017). Using implementation strategies, SME leaders can tackle technical and organizational issues and align the business processes and the organizational strategic plan with the ERP implementation strategy.

In Section 1, I described the purpose of the study and highlighted the advantages and potential benefits of implementing cloud-based ERP solutions in SMEs. A qualitative multiple case study research design was most suitable to explore strategies necessary for implementing cloud-based ERP systems to avoid failure and improve company performance. In Section 1, I outlined the research question, assumptions, limitations, participant's qualifications, and location. Additionally, Section 1 included a discussion of the implications of social change and the significance of the study to unfold the aim of conducting this research. DOI theory augmented with Six Sigma was the conceptual framework for this study. The review of the literature regarding DOI theory, Six Sigma, SMEs, cloud computing, ERP systems, and ERP implementation strategies provided the background for the study. In Section 2, I detail the research method and design,

population and sampling schemes, data collection process, data analysis techniques, and

the study's reliability and validity. Additionally, the study results and findings,

applications to professional practice, implications for social change, recommendations for

action and further research, reflections, and the conclusion are presented in Section 3.

Section 2: The Project

In Section 2, I restate the purpose of the study and describe the role of the researcher in the data collection process as well as research methods used in this study. The section includes details regarding the target population, selection process, research ethics, and data collection techniques and instruments that I used to analyze the research findings. I conclude Section 2 with a discussion of the reliability and validity of the research instruments, transitional summary of topics in Section 2, and overview of Section 3.

Purpose Statement

The purpose of this qualitative multiple case study was to explore strategies that SME owners use to implement cloud-based ERP solutions to improve performance and growth in their businesses. The target population was owners of four SMEs who have successfully implemented cloud-based ERP strategies to improve business performance and growth in Lebanon. The purposively chosen participants were likely to provide data that will enhance SME owners' understanding of how implementing cloud-based ERPs supports positive social change by providing stable job opportunities, reducing poverty in Lebanon through economic growth, and reducing the environmental consequences of computing.

Role of the Researcher

Academic research is a process that researchers undertake in a systematic and well-defined manner to increase knowledge in a specific domain (Alase, 2017). The researcher should collect, analyze, and interpret data and reach a conclusion (McKenna,

Myers, & Newman, 2017), while maintaining a detached, neutral, and objective stance (Yin, 2018). The researcher must also select a research method and design; accordingly, I selected to conduct a qualitative multiple case study design. My tasks as a researcher were to (a) find participants willing to provide input, (b) collect data from participants, (c) analyze and interpret the responses, and (d) report the findings.

Interviewing SME leaders and retrieving ERP implementation documents were the data collection techniques in this study. My role as a researcher in the data collection process was limited to four activities. First, I developed an interview protocol to maintain consistency of questions in the interviews. Second, I sought Walden University's Institutional Review Board (IRB) approval before interviewing participants. Third, I interviewed multiple SME leaders after securing informed consent from the interviewees. Finally, I (a) recorded the interviews, (b) transcribed the interviews' recordings, and (c) stored transcriptions in a computer-assisted qualitative data analysis software (CAQDAS) to create a case study database. As a researcher, I was also responsible for conducting an ethically sound study and preventing any harm to the participants.

According to the ethical guidelines of *The Belmont Report* (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979), a researcher must understand the ethical issues inherent in research involving human subjects. To comply with these guidelines, I followed the basic ethical principles in *The Belmont Report*: (a) respect for persons, (b) beneficence, and (c) justice. I demonstrated respect for participants by requesting written informed consent from all participants to confirm their voluntary participation in the study. The informed consent form included

(a) an explanation of potential risks and benefits, (b) confirmation of the voluntary nature of the study, and (c) a description of measures to ensure participants' privacy, confidentiality, and anonymity. I waited for Walden University's IRB approval before engaging the participants.

Receiving IRB approval confirmed that I understand how to engage participants according to the ethical guidelines of *The Belmont Report*. I ensured confidentiality and anonymity of the participants by using codes in the transcripts to represent participants and securely storing recordings and data documents within locked locations. Researchers should understand the principle of beneficence as an obligation to minimize risks to participants and prevent any harm (Westfall et al., 2017). I minimized the risks to participants by using the informed consent process and protecting the confidentiality and privacy of participants.

Justice is the principle of treating participants with fairness and impartiality (Westfall et al., 2017). Injustice occurs when an individual or group consistently benefits from participation in research or when an individual or group bears the burden of the risks of participation in research (Obenchain & Ives, 2015). To comply with the justice principle, researchers should remain focused on observing and learning about participants' experiences without imposing their views. To prepare for this study, I completed the web-based training on protecting human research participants offered by the National Institutes of Health Office of Extramural Research. I received my certificate of completion on September 24, 2018.

Another aspect of protecting participants is to be aware of the possibility of researcher bias, a process wherein a researcher influences the research findings and outcomes to achieve a desired outcome (Dodgson, 2017). My previous personal and professional experience supported my goal of interviewing SME leaders who have successfully implemented cloud-based ERP software solutions in Lebanon. I have experience in planning, developing, and implementing cloud-based solutions in SMEs, big enterprises, and government agencies. I have worked in the software development industry for 13 years and implemented cloud-based solutions, including cloud-based ERP systems. I also have lived and worked in Lebanon.

These same experiences may lead to researcher bias, wherein a researcher with experience and knowledge in the research topic may unintentionally introduce bias into the analysis of data (Buetow, 2019). To prevent the influence of my previous knowledge and beliefs, I ensured I had no personal or professional relationship with the participants. Also, I employed (a) bracketing, (b) reflexive journaling, and (c) member checking to mitigate the risk of bias. Researchers use bracketing in qualitative research to mitigate the potentially deleterious effects of prejudices that may interfere with the research process (Levitt, Motulsky, Wertz, Morrow, & Ponterotto, 2017). I used bracketing to identify and temporarily set aside my assumptions during (a) interviews, (b) analysis, and (c) documentation. The reflexive journaling technique involved capturing my observations accurately after each interview. The reflexive journal contained observations of phenomena not captured through audio recordings, including characteristics of the interview location, details of the cultural context, and ideas to develop the study

(Cypress, 2017). Member checking is another technique that helps reduce bias in qualitative research; it involves asking participants to affirm the meaning and intent of their responses (Thomas, 2017). During member checking interviews, I shared my interpretations of participants' responses and questioned the participants to determine the accuracy of my interpretations. Member checking allows participants to (a) review interpretations of their responses, (b) comment on them, and (c) affirm those responses (Smith & McGannon, 2018). Using bracketing, reflexive journals, and member checking process can reduce bias and safeguard research from misinterpretations.

Researchers can develop and follow an interview protocol to maintain consistency of research questions and improve the quality of research (Yin, 2018). An interview protocol is a structured process for conducting interviews and improving the quality of collected data (Majid, Othman, Mohamad, Lim, & Yusof, 2017). Implementing an interview protocol in qualitative research is another way researchers mitigate the impact of bias (Fusch, Fusch, & Ness, 2018). I developed the interview protocol (see Appendix A) in this study to (a) establish a relationship with the participants, (b) sustain my focus on the interview questions, and (c) mitigate the risk of bias during interviews.

Participants

Before selecting participants, a researcher should determine eligibility criteria, places to recruit participants, and participant selection methods (Yin, 2018). For case study research, eligibility criteria are that participants should have experience involving the phenomenon under study (Yin, 2018). For the purpose of this study, participants were SME owners who implemented cloud-based ERP solutions in their companies.

Participants included SME owners in Lebanon with a minimum of 5 years of experience

who employed 10 to 50 subordinates. Participants had annual sales of less than 3 million

USD. A minimum of four SME owners participated in interviews to discuss the strategies

they used to implement cloud-based ERP solutions. I selected as participants SME

owners who successfully implemented cloud-based ERP solutions and enhanced the

performance and growth of their companies.

Social media networks such as LinkedIn are tools for locating and accessing

organizational leaders to participate in a research study (Maramwidze-Merrison, 2016). I

used LinkedIn to locate SME owners who implemented cloud-based ERP solutions in

their companies. I used the LinkedIn messaging service to contact SME owners and

explain the research study and ask for their contact information. Also, I considered

snowball sampling to find participants who are not on LinkedIn. Snowball sampling is a

sampling technique wherein participants suggest or recruit other eligible participants

from among their acquaintances (Marcus, Weigelt, Hergert, Gurt, & Gelléri, 2017).

Once I had located potential participants, I used phone calls followed by an e-mail

to introduce (a) the research purpose, (b) the eligibility criteria, and (c) the informed

consent process. Following the introduction, I e-mailed a consent form if the owners met

the established criteria. All participants who agreed to interview will sign a consent form

to confirm their voluntary participation. I provided each participant with the opportunity

to review the informed consent form and ask questions about the interview or the

research process before signing the consent form. E-mailing will be the appropriate

method of communication when participants request any clarification as well as to

schedule the interviews. After obtaining the signed consent forms through e-mail, I scheduled the interviews at a time convenient for the participants and preferably in the participants' workplaces. I requested permission from the participants to record the interviews for reviewing and documentation. I interviewed the four participants in person and audio-recorded all the interviews with the participants' permission.

Establishing a relationship with participants is an essential element for obtaining quality information and coherent and well-defined answers to interview questions during the interview process (Dempsey, Dowling, Larkin, & Murphy, 2016). The first step in establishing a working relationship with the participants should be through personal contact (O'Grady, 2016). The prompt and respective contact with the participants on the phone and e-mail should build a rapport with the participants (Yin, 2018). My objective was to develop a rapport with the participants by establishing tuneful and consistent communications to alleviate bias and build a sociable and professional researcher-participants relationship. Trust is another key element necessary for starting a working relationship with participants (O'Grady, 2016). The participants must be comfortable in the interview setting to share high-quality information. The objective of the interview process was to enable participants to communicate and exchange information without hesitation or worry.

Participants may worry about issues of data ownership and confidentiality, which may prevent the sharing of accurate information (Yin, 2018). To ensure confidentiality, I used letters and numbers to refer to participants during coding, analysis, and reporting for this study. Each participant had the choice to withdraw from the study at any time

without any consequences. The consent form included a statement that the collected data

from the study will remain in a secure and safe location for 5 years to protect

participants' confidentiality. I took all the necessary measures to protect the privacy of

participants and to maintain the confidentiality of their data.

Research Method and Design

Research Method

In this study, I used the qualitative research method. Researchers conduct

qualitative research to explore, explain, and understand a phenomenon (Yin, 2018).

Researchers use qualitative research to (a) produce rich descriptions of complex

phenomena, (b) highlight the experience of participants during a phenomenon, and (c)

provide a detailed explanation after exploring a phenomenon (Kozleski, 2017).

Researchers also carry out qualitative research to conduct an in-depth exploration of the

interpretations and views of the participants (Symon, Cassell, & Johnson, 2018). The

qualitative method was appropriate for this study because of the goal to generate a rich

description of the selected phenomena under study. The phenomena under study were

strategies that SME owners in Lebanon use to implement cloud-based ERP solutions to

improve performance and growth. I collected data by interviewing SME owners and from

analyzing company documents related to the study.

In contrast to qualitative research, researchers used the quantitative method to test

one or more hypotheses about a phenomenon by examining the relationships among

numerically measured variables (Taguchi, 2018). The quantitative method was not

suitable for this study because I did not test hypotheses or examine any relationships

among variables. The mixed-methods research methodology comprises qualitative and quantitative methods elements. Researchers use mixed methods when they attempt to consider multiple viewpoints, perspectives, positions, and standpoints (McKim, 2017). Mixed-methods researchers do not achieve in-depth exploration or rich descriptions of a complex phenomenon because they consider the collected qualitative data as supporting evidence to the quantitative study (Gibson, 2017). The mixed methods research methodology was not suitable for this study because I did not include or collect any quantitative elements.

Research Design

To select a research design for the study, I considered four qualitative research designs: (a) case study design, (b) ethnographic design, (c) phenomenological design, or (d) narrative design (Yin, 2018). A case study research design is a research strategy and an empirical inquiry wherein a researcher investigates a phenomenon within its real-life context (Rahi, 2017). Researchers use a case study design to conduct an in-depth investigation of a phenomenon and produce a descriptive and exploratory analysis of a single person, group, or event (Cronin, 2014). No specific criteria dictate when to use a case study design, but the more a researcher wants to explore, analyze, and explain a specific phenomenon, the more a case study research will be relevant (Johnston, 2014). Researchers can select one of the three types of case studies: (a) exploratory, (b) explanatory, or (c) descriptive (Yin, 2018). The exploratory type of case study is the best fit for this study because it supports exploration of success stories and demonstration of the effectiveness of practices under investigation (Lewis, 2015). I used the case study

design to explore successful strategies that some SME owners used to implement cloud-based ERP solutions.

The case study design may be either a single case or multiple case study (Yin, 2018). Researchers can provide richer descriptions and stronger analytical conclusions in a multiple case study than a single case study (Baxter & Jack, 2008). Researchers use the multiple case study design to strengthen the credibility of a study and allow a wide exploration of the research questions (Yazan, 2015). I used the multiple case study design to explore successful strategies that SME owners to implement cloud-based ERP solutions and improve a company's performance and growth.

Researchers adopt ethnographic design to observe participants in a real-life environment and explore research questions at the societal, structural, organizational, and individual levels (Fusch, Fusch, & Ness, 2017). Researchers using ethnographic design require long observational periods in the field and detailed interview evidence (Bass & Milosevic, 2018). Researchers use phenomenological design to describe how participants experience a certain phenomenon (Alase, 2017). Researchers conducting phenomenological studies study the life experiences of participants and explore the participants' culture, feelings, beliefs, and convictions (Flynn & Korcuska, 2018). In this study, I did not explore culture, feelings, beliefs, or lived experiences of participants; therefore, ethnographic and phenomenological research designs were not suitable for this study. Researchers use narrative design to (a) collect stories about experiences of individuals, (b) describe a life experience, and (c) discuss the meaning of the experience with the individual (Lewis, 2015). The goal of this study was not to introduce and

describe individual experiences; thus, the narrative approach was not suitable for this study.

Having selected the method and design for this study, I also considered how to determine the appropriate sample size to collect sufficient data to answer the research question. In qualitative research, no formula exists to calculate the sample size needed to reach data saturation (Boddy, 2016; Nelson, 2017; B. Saunders et al., 2018). Data saturation is the point in the data collection process where collecting more data will not lead to new information related to the research questions (Fusch & Ness, 2015). Data saturation is unique in every study; the sample size needed to reach data saturation depends on the researcher's definition of saturation (B. Saunders et al., 2018). However, if a researcher does not reach data saturation, the quality of the research and validity of the findings may suffer (Hennink, Kaiser, & Marconi, 2017).

A researcher can determine to have reached data saturation when (a) no new data emerge from additional attempts to collect, (b) no new themes emerge, (c) no new codes emerge, and (d) another researcher can replicate the study (Lowe, Norris, Farris, & Babbage, 2018). Data saturation involves reaching a situation wherein researchers cannot find additional data to develop new categories while disentangling the relationships between the developed categories. For each participant, I kept probing to obtain as much information as possible and use codes to identify as many themes as possible. I had attained data saturation when I was not able to identify any more themes.

Population and Sampling

Researchers should identify a sampling method that closely aligns with the

research purpose to credibly and sufficiently address the problem statement and research

question (Rahi, 2017). Purposeful sampling is a sampling technique to select participants

based on pre-defined criteria and the research question (Onwuegbuzie & Collins, 2017).

Qualitative researchers use purposeful sampling to recruit participants who can provide

in-depth and detailed information about the phenomenon under study. I used purposeful

participant selection for this study to select participants who have successfully

implemented cloud-based ERP solutions and improved the performance and growth of

their companies. I used snowball sampling as a back-up plan if I could not reach a

sufficient number of participants to reach data saturation. Snowball sampling is a

technique that researchers use to recruit more participants by asking previously recruited

participants to refer potential participants who may wish to contribute to the study (van

der Burgt, Kusurkar, Croiset, & Peerdeman, 2018). The potential participants collected

from the snowball sampling technique should meet the purposeful sampling eligibility

criteria. Using purposeful sampling and snowball sampling, I focused on selecting

accessible cases that are relevant in answering the research question.

In general, qualitative studies require a smaller sample size than quantitative

studies (H. Kim, Sefcik, & Bradway, 2017). Qualitative sample sizes should be large

enough to provide sufficient data to describe the phenomenon of interest and address the

research questions (Boddy, 2016). The sample size is based on achieving theoretical

saturation, which is the point at which newly collected data suggest no additional insights

(B. Saunders et al., 2018). A sample size of two or three participants could be adequate for a qualitative case study research (Yin, 2018), if the researcher can reach data saturation. However, no ideal sample size exists for qualitative studies because the sample size depends on many factors including the purpose of the study, the research question, and attainment of data saturation (B. Saunders et al., 2018). An ideal sample size is the one at which data saturation occurs (Fusch et al., 2017).

The population for this study consisted of SME owners in Lebanon who have successfully implemented cloud-based ERP systems. Selecting a sample of participants from a single nation or business leaders who have adopted a certain technological feature is not unprecedented in the literature. McCamley and Gilmore (2017) used purposeful sampling in a qualitative study to select nine SME owners to explore emerging heritage tourism in Northern Ireland. Raja Mohd Ali, Mohamad, Talib, and Abdullah (2018) used purposeful sampling to select and interview three SME leaders to explore the roles of top management and users in strategic information systems planning. I selected four owners of the SMEs with strategies for cloud-based ERP systems implementation to participate in the study. I conducted a case study for each of the four SMEs and applied the method of triangulation to confirm data saturation.

Researchers use triangulation to achieve convergence of information from multiple data sources (Gibson, 2017; Renz, Carrington, & Badger, 2018). Using triangulation, researchers attain data saturation by exploring and analyzing the different perspectives on the phenomenon under study. Ensuring data saturation enhances the credibility of the research (Gibson, 2017). In addition to interviewing participants,

researchers may collect company documents and perform an in-depth analysis of the case

study (Yin, 2018). In this study, I reached data saturation by applying triangulation and

conducting semistructured interviews with participants until data redundancy occurs.

Also, I collected and reviewed company documents related to the implementation of

cloud-based ERP systems and consider that information in the analysis. The strategy to

achieve data saturation was to carry out a multiple case study of the four SMEs with the

possibility of conducting more case studies with additional companies on failure to attain

data saturation.

I used purposeful sampling to recruit participants who meet the following

eligibility criteria: (a) the participants must be owners of SMEs, (b) the participants must

have successfully implemented cloud-based ERP in their SMEs, and (c) the SME must be

in Lebanon. Researchers establish eligibility criteria to ensure recruitment of participants

who can answer the interview questions in sufficient detail (Palinkas et al., 2015). The

targeted participants were SME owners who implemented cloud-based ERP systems to

improve company performance and growth.

Interviews are negotiated undertakings between researchers and participants, and

the interview settings and situations shape the interaction (Gagnon, Jacob, & McCabe,

2015). I conducted face-to-face semistructured interviews with participants at the

participants' chosen times and locations. The interview setting should be a convenient

place where the participant is comfortable to share information (Dempsey et al., 2016). I

advised the participants to have the interviews at their company premises in a secure and

quiet room. I informed the participants that the duration of the interview would be 60 to

90 minutes, and no co-workers should be present at the interview location. I ensured that

no interruptions or distractions are likely during the interview and that the interviewee

was comfortable to answer the questions openly.

Ethical Research

All researchers are responsible for upholding best practices for ethical research.

One aspect of ethical concern in qualitative research is the informed consent process,

which includes communication with the potential participants, the informed consent

form, and the participants' decision to participate in research (Hallinan, Forrest,

Uhlenbrauck, Young, & McKinney, 2016). A second concern is protecting participants

from harm, and a third is ensuring the privacy and anonymity of participants by

concealing private information and taking measures to keep all data safe and confidential.

The informed consent process is necessary for a researcher to adhere to *The*

Belmont Report's principle of respect for persons (National Commission for the

Protection of Human Subjects of Biomedical and Behavioral Research, 1979). The

participant informed consent should contain three elements: (a) information, (b)

comprehension, and (c) voluntariness. The aim of the informed consent process is to

ensure that (a) participants have a clear understanding of the consent information, (b)

participants are aware of the risks and benefits of the study, and (c) participants' consent

is voluntary (Tinkler, Smith, Yiannakou, & Robinson, 2018). A researcher must provide

participants detailed information about the study to confirm that participation is voluntary

(Yin, 2018). I sent an e-mail to each potential participant including the informed consent

form. A participant was eligible for interview only after signing the informed consent form.

Before any interviews begin, each participant gave consent by signing the participant consent form. I ensured that the participants understand the confidentiality and privacy measures that I took during the data collection process. Also, I ensured that the participants understand their right to withdraw from the study at any time. Any participant could withdraw from the study by simply ceasing to participate at any time during the study. If a participant withdrew from the study, I would purge any data collected from that participant and remove any information related to the participant in the study. I worked on establishing a friendly business relationship with participants by building trust to maximize the quality of collected data during interviews. I did not offer any rewards or incentives to the participants for taking part in this study. The participant consent form indicated that participants received no compensation for participating in the study.

I took the necessary measures to ensure adequate ethical protection of participants taking part in this study. First, I ensured that the informed consent form (a) provided participants the necessary information about the study, (b) ensured participants have a clear understanding of the consent information, (c) ensured that participant consent is voluntary, and (d) ensured that participants understand that they can withdraw at any time from the study. The selected participants were adults and have the capacity and knowledge to answer the interview questions and provide pertinent documents for the study due to their leadership positions in the selected companies. As a second method of

ensuring participant safety, I completed the National Institutes of Health (NIH) Office of

Extramural Research web-based training on the protection of human research participants

(Appendix B) to improve my skills and knowledge in the area of ethical protection of

humans when participating in a research study. Finally, I obtained Walden University

IRB's approval before starting the data collection process. Researchers must follow their

institution's IRB guidelines and obtain IRB approval before starting data collection (Yin,

2018). The Walden University approval number for this study was 11-20-19-0732078.

Researchers should take measures to protect the privacy and confidentiality of

participants and adhere to the two ethical principles of *The Belmont Report*: respect for

persons and beneficence (Miracle, 2016). Researchers should treat participants as

autonomous agents and protect their right to privacy and keep private information

confidential (Jain, Kuppili, Pattanayak, & Sagar, 2017). Researchers should protect the

confidentiality and privacy of participants to minimize risks to participants and prevent

any harm according to the ethical principle of beneficence (Westfall et al., 2017). I took

measures to protect the names of participants and their organizations. I did not include

the participants' real names anywhere in the study. Instead, I used codes to identify

participants and organizations such as P1O1, P2O2, P3O3, and P4O4. I ensured that all

participants' names, information, and documents collected during the study remain

confidential.

A researcher should protect any information related to participants by securing all

printed documents and electronic data in a safe location (Øye, Sørensen, & Glasdam,

2016). The consent form included a statement that the collected data from the study will

remain in a secure and safe location for 5 years to protect participants' confidentiality. I

kept all collected data in digital format. I encrypted data collected for this study using file

encryption tool and save the files on a password-protected computer hard disk. I stored

the hard disk in a locked home office drawer for safekeeping. Five years after the study, I

will delete all collected data by reformatting the disk.

Data Collection Instruments

In a qualitative research study, the researcher is the primary data collection

instrument (Twining, Heller, Nussbaum, & Tsai, 2017). In qualitative case study

research, a researcher can collect data from multiple sources such as (a) interviews, (b)

direct observations, (c) participant observation, and (d) document analysis (Yin, 2018).

Interviewing is the primary data collection technique in case studies. Researchers can use

interviews to explore participants' experiences, explanations, and perspectives in depth.

Researchers can also collect data from analysis of documents related to the case study

(Majid et al., 2017). The collected documents may be (a) e-mails, (b) minutes of

meetings, (c) progress reports, (d) project plans, and (e) evaluations (Yin, 2018). In this

study, I used face-to-face interviews and document analysis as data collection techniques.

Interviewing is a qualitative data collection technique that involves direct one-on-

one engagement with participants (Gagnon et al., 2015). Interviewing participants is an

effective technique for exploring the phenomenon under study (Yin, 2018). A researcher

conducting semistructured interviews asks the same set of predetermined questions to all

participants involved in the study, and the researcher has the flexibility to ask follow-up

questions for further clarification (Young et al., 2018). For this research study, I prepared

open-ended interview questions (Appendix C) and asked participants the set of questions

while taking notes and audio recording the entire interview for later transcription.

In each interview, I asked participants eight open-ended questions followed up by

probing questions to ask the participants to elaborate on the strategies they used to

implement cloud-based ERP solutions. A researcher posing open-ended questions and

follow-up probes can obtain an in-depth description of participants' experiences and

understanding (Rosenthal, 2016). With consent from participants, I audio recorded the

interviews and later transcribed the data into text using cloud-based Trint software. Also,

I kept a reflexive journal during each interview to capture any nonverbal observations. In

this study, the primary data collection technique was face-to-face semistructured

interviews with open-ended questions.

Documents from the SMEs were the secondary source of data for this study.

Document analysis involved collecting and reviewing relevant company documents, in

this study, cloud-based ERP project planning documents and documents related to ERP

implementation. Document analysis is the process of collecting relevant documents to

interpret and synthesize the data from the documents (Brooks & Normore, 2015). The

advantage of using document analysis technique is to verify and support evidence from

other sources (Yin, 2018). Triangulation of multiple sources of data can enhance the

reliability of the data collection process and improve the credibility of the results (Renz et

al., 2018). I implemented triangulation in this study by cross-checking the interview data

from SME owners who have implemented cloud-based ERP against the data from

relevant company documents.

Overall, the use of the following techniques, (a) implementing an interview protocol, (b) using member checking, and (c) applying triangulation of data sources, will enhance the reliability and validity of the data collection instruments and process. Reliability of the data collection process demonstrates the degree of consistency future researchers can obtain when repeating those procedures (Yin, 2018). Validity indicates the degree of accuracy of the results that researchers obtain from the data collection process (Cypress, 2017). I adhered to the interview protocol (Appendix A) to ensure I administered the same process with each participant. A researcher uses an interview protocol to minimize bias and guarantee in the interview process (Yin, 2018). After all data collection was complete, I implemented member checking and triangulation to further confirm the accuracy and validity of data and conclusions.

Member checking is a validation strategy to improve the accuracy, credibility, and validity of the data collection process (Thomas, 2017). A researcher uses the member checking method to share the findings and data analysis conclusions with the participants and requests the participants to comment or provide feedback (Smith & McGannon, 2018). I met with the participants after completing data analysis to ask participants to review my conclusions and give me feedback. Finally, I implemented methodological triangulation by using two data sources in the data collection process: interviews and document analysis. Researchers can use multiple data sources to improve the reliability of the data collection process and ensure convergence of information from the multiple data sources used (Yin, 2018). In this study, I used an interview protocol, member

checking, and triangulation with multiple data sources to adjust my performance and maintain focus during the research focus.

Data Collection Technique

In this qualitative multiple case study, I explored the strategies that SME owners used to implement cloud-based ERP solutions. I collected primary data by conducting semistructured face-to-face interviews using open-ended questions (Appendix C). The participants in this study were owners of SMEs who have implemented cloud-based ERP solutions. Analysis of company documents related to ERP implementation was the secondary source of data. A researcher should target collecting evidence from multiple sources to ensure the convergence of information and improve the reliability of the findings (Yin, 2018).

In qualitative case study research, a researcher can use interviews as a data collection technique to explore the phenomenon under study (Yin, 2018). As previously described, semistructured interviews involve the researcher asking the same set of previously designed questions to all participants and following up by probing questions to clarify the participants' observations or answers (Young et al., 2018). Using an interview protocol, researchers ensure consistency between interviews and maximizes the quantity and quality of the information collected (Castillo-Montoya, 2016). I conducted the interviews with the participants in the participants' work premises.

The participants were part of the study only after they voluntarily sign the participant consent form. In qualitative interviews, a researcher should opt to arrange the interview with participants at the participants' chosen times and locations (Gagnon et al.,

2015). I communicated with participants using e-mails and phone calls to schedule interview dates and times. I shared a copy of the interview questions using email to the participants before the interview. Participants who receive interview questions in advance can understand the purpose of the study and respond with precision during the interview (Cridland, Jones, Caputi, & Magee, 2015). Also, I asked the participants to prepare supporting documents related to the study to share a copy during the interview such as project plans, ERP implementation strategy, software specification documents, and post-implementation evaluation documents.

Before starting the interview, I performed the following activities. First, I stated the interview purpose and explained the interview process to each participant. Second, I ensured that each participant signed the consent form and restated that each participant could withdraw from the study at any time. Third, I requested each participant's permission to audio-record the interview. Finally, I confirmed that each participant was ready for the interview.

Then, I commenced the interview with each participant following the interview protocol (Appendix A). I used a reflexive journal to record nonverbal observations during interviews to ensure data accuracy. Researchers take notes to record participant reactions, minimize preconceptions, and eliminate interview bias (McMahon & Winch, 2018). At the end of each interview, I thanked each participant for taking part in the interview, and I informed each participant that I would request another meeting after completing data analysis to ask them to review my conclusions and give me feedback.

Researchers conduct qualitative interviews to collect detailed information about the phenomenon under study (Yin, 2018). One advantage of qualitative interviews is that participants have the opportunity to elaborate and answer a researcher's questions using their words and from their perspectives (Basias & Pollalis, 2018). Another advantage of qualitative interviews is that researchers can make nonverbal observations to keep the participants focused on reporting the needed information (Weller, 2017). Also, a researcher and the participants can request clarifications from one another on any issue.

The process of collecting data through interviewing has the disadvantages of the time and cost involved and the possibility of bias (Devotta et al., 2016). A researcher may misinterpret the participants' responses to the prepared questions or the participants' answers to follow-up questions (McIntosh & Morse, 2015). To mitigate any misunderstanding, I asked several follow-up questions and developed detailed discussions of each response. Also, I used the member checking technique to confirm my understanding and interpretation of the collected information.

Document analysis was the secondary data source. As part of the interview process, I requested documents related to cloud-based ERP implementation from each participant. I asked for digital copies of documents related to ERP implementation, such as project plans, strategic project goals, software specification documents, and post-implementation evaluation documents. After receiving the documents, I reviewed and analyzed the documents to develop codes, and after that, through triangulation, related the data from documents to the interview data to determine emerging themes.

Researchers collecting documentary evidence have the advantage of validating evidence collected from other sources (Yin, 2018). Documents can be a source of rich background information, helpful in exploring the historical context of the phenomenon under study (Cleland, 2017). The document analysis method is less time-consuming than conducting interviews, and documents are more rigorous as evidence than interview information (Bowen, 2009). However, it is difficult to gain access to relevant documents in a company, and the possibility exists that some documents may be biased (Baškarada, 2014).

Member checking is a strategy to improve the validity of the data collection process and reduce bias (Thomas, 2017). I used the member checking technique by completing the interpretation of the transcribed interviews and share a summary of these findings with each participant at a second meeting. The participants had the opportunity to check for any mistakes or misrepresentation of their perspectives or opinions. I requested from each participant to suggest any corrections before completing the final study. Member checking is a participant validation strategy to confirm the accuracy of the information, and it increases the consistency and credibility of the study (Birt, Scott, Cavers, Campbell, & Walter, 2016; Caretta, 2016). I considered all suggestions from the participants during member checking to ensure that my interpretations of the collected information from interviews accurately reflect the participants' perspectives. After confirming the accuracy of data summaries, preparation for data analysis began.

Data Organization Technique

Data organization refers to the techniques of handling and managing qualitative

data (Maher, Hadfield, Hutchings, & de Eyto, 2018). Researchers implement

organization techniques to easily locate specific information during the data analysis

process (Houghton, Casey, & Smyth, 2017), and they may use software to store,

organize, analyze, and identify themes (Castleberry & Nolen, 2018; Houghton, Casey, et

al., 2017). NVivo 12 is a qualitative data analysis computer software package that

researchers can use for data organization and analysis (Houghton, Casey, et al., 2017;

Maher et al., 2018). Researchers can use NVivo to store collected data, code participants'

responses and documents, and identify themes for data analysis (Houghton, Murphy, et

al., 2017). I saved the transcribed interview data and documentary data into NVivo

software for data handling and data analysis. I used codes P1O1, P2O2, P3O3, and P4O4

to denote the participants and their organizations, and I used codes D1O1 and D2O1 to

denote documents from one organization and D1O2 to denote another document from

another organization. I used the technique of referring to participants and documents by

codes to protect the real identities of participants and ensure the confidentiality of the

documentary evidence.

A researcher must commit to maintaining the confidentiality of the collected

information from participants during a study (Øye et al., 2016). I maintained all data in

digital format, including audio-recorded interviews, transcribed interviews, journals,

company documents, e-mails, and consent forms. I encrypted data using a file encryption

tool and saved the files on a password-protected computer hard disk. I securely stored the

hard disk in a locked home office drawer only accessible by me. Five years after finalizing the study, I will delete all collected data by formatting the hard disk.

Data Analysis

Data analysis in a qualitative study is a set of activities researchers carry out to understand and draw conclusions from the raw data (Castleberry & Nolen, 2018). Researchers conducting data analysis in qualitative case studies should use a thorough and methodological process to guarantee the dependability and credibility of the findings (Yin, 2018). Methodological triangulation is a process whereby a researcher gathers data from several sources and uses one set of data to confirm the dependability and validity of another set of data (Fusch & Ness, 2015). I used methodological triangulation during the data analysis process, comparing coded data from document analysis to confirm the credibility and validity of the coded interview data. Yin (2018) suggested qualitative researchers use a five-phase data analysis process of (a) compiling, (b) disassembling, (c) reassembling, (d) interpreting, and (e) concluding. I used Yin's five-phase process to analyze data collected from semistructured interviews and documentary evidence.

Compiling Data

Researchers begin the compiling process by collecting and categorizing data (Yin, 2018). The purpose of the compiling phase is to develop an organized database to store the raw data (Yin, 2018). I began the data compilation process after transcribing the interview recordings, completing the member checking process, and reviewing the collected organizational documents. During the data analysis phase, researchers can use an interpretive content analysis process to code and identify themes (Bengtsson, 2016).

The purpose of the content analysis process is to sort and produce meaning from the data

and to draw conclusions (Vaismoradi, Jones, Turunen, & Snelgrove, 2016). I used

interpretive content analysis to analyze the interview transcripts and understand the

participants' point of views and thoughts. I reviewed and analyzed the results of member

checking to confirm the compiled data converges to the participants' intentions and

viewpoints. Finally, I compiled the data using Microsoft Word and Microsoft Excel

before commencing the disassemble phase using NVivo 12.0 software.

Disassembling Data

During the disassembling phase, a researcher breaks down the compiled data into

smaller fragments and assigns labels to each fragment (Yin, 2018). I used NVivo 12.0

software to organize the data into logical groupings. Using NVivo 12.0, I disassembled

the data into nodes and labeled each node to create codes. Researchers can develop

emerging themes by grouping data fragments into nodes (Vaismoradi et al., 2016). I

organized the disassembled data nodes into thematic groupings to start the data

reassembly phase.

Reassembling Data

Reassembling is the process of thematically sorting, arraying, and organizing the

data fragments into logical groups (Yin, 2018). I reassembled the fragments of data into

thematic groups to start developing emerging themes and patterns. Researchers can

organize data based on patterns and themes to start drawing a meaningful picture of the

phenomenon under study to tackle the research question (Vaismoradi et al., 2016).

During the reassembling data phase, a researcher should be thorough and consistent in the

coding process to develop themes and patterns that represent distinctive logical groupings of information and connect the fragmented data (Graneheim, Lindgren, & Lundman, 2017). Reassembling data is a recursive process wherein a researcher can present data into tables, graphs, and charts to achieve a better examination of themes and their relationships (Yin, 2018). I followed a consistent coding process, reviewed the codes, and ensured a distinctive logical grouping of themes and patterns before starting the data interpretation phase.

Interpreting Data

During the interpreting data phase, a researcher uses inductive reasoning to synthesize reassembled data and develop narratives (Maher et al., 2018). While developing narratives, a researcher should strive to remain unbiased and resist any urge to shape data into desired outcomes (Yin, 2018). I developed narratives from the reassembled data and applied objective interpretations based on the emerging themes to gain a deep understanding of the cloud-based ERP implementation strategies. Interpreting data is a process researchers assume to explore the logical groupings of fragments and patterns to distinguish the emerging key themes and subthemes (Yin, 2018). I explored the data grouping and patterns to discover the key themes to answer the overarching research question of this study.

Concluding Data

During the concluding phase, a researcher should draw strong conclusions from the interpreted data with deep meanings of the phenomenon under study (Yin, 2018). I completed the data analysis process by developing conclusions from the narratives to

confirm the emergent themes and subthemes. The conclusions must derive from the data

and not the researcher's subjective point of view (Graneheim et al., 2017). During the

data analysis process, I maintained an objective interpretation of the participants'

interview responses and documentary evidence. Yin (2018) noted that the data analysis

process is nonlinear, and a researcher can revisit any phase if additional reviews or

updates are necessary. I revisited the disassembling, reassembling, and interpreting data

phases to draw conclusions that answer the research question of this study. Using Yin's

five-phase data analysis process, I used methodological triangulation by analyzing

documentary evidence to validate the interview data.

Software Plan

I used Microsoft Word and Microsoft Excel to develop a database to sort (a)

participants' responses from the interviews, (b) the results from member checking, and

(c) the data collected from document analysis. NVivo is a qualitative data analysis

software that researchers employ during the data analysis process to code data and

identify themes (Houghton, Murphy, et al., 2017). I used NVivo 12.0 software during

data analysis to fragment data into nodes, label nodes with codes, and develop emergent

themes and subthemes. After collecting data from semistructured interviews and

documentary evidence, I imported the transcribed interviews and textual information

from documents into NVivo 12.0 to analyze data.

Key Themes

After finalizing the concluding data phase, I focused on the emergent key themes

and the strategies that SME owners used to implement cloud-based ERP solutions to

improve company performance and growth. I avoided bias during the research process by using an interview protocol (Appendix A), implementing the member checking technique, and using methodological triangulation to confirm the key themes from the data analysis phase. The data analysis process involved iterating through the phases of the data analysis process and reviewing collected data, reflexive notes, and the literature review (Yin, 2018). A qualitative researcher should correlate key themes from the data with the selected conceptual framework and related scholarly literature (Fakis, Hilliam, Stoneley, & Townend, 2014).

Researchers may highlight themes in previous research to improve validity in the findings and distinguish key themes (Kallio, Pietilä, Johnson, & Kangasniemi, 2016). I compared the frequency of the themes in this study to previous research and linked themes and subthemes from the interpreting data phase to provide insight into existing and future studies. I correlated the emerging key themes with the literature review on SMEs and cloud-based ERP implementation, as well as with the DOI theory and Six Sigma theory, which comprised the conceptual framework for this study.

Reliability and Validity

In qualitative case studies, researchers should ensure the quality of research to confirm that findings can be incorporated in business practices. Rigor and trustworthiness of qualitative research connect to the concepts of reliability and validity (Cypress, 2017). Reliability and validity are two criteria researchers can use to ensure the trustworthiness of research findings (Leung, 2015). Qualitative researchers consider that dependability, credibility, transferability, and confirmability are trustworthiness criteria to confirm the

rigor of qualitative findings (Connelly, 2016). In qualitative research, validity and reliability emanate from credibility, transferability, dependability, and confirmability of the instrumentation and results of the study (Mandal, 2018). A qualitative researcher should plan and implement strategies to ensure rigor and quality during the research study (Hadi & José Closs, 2015). In the following sections, I explained the procedures to assure dependability, transferability, credibility, and confirmability of the findings of this study.

Dependability

Dependability refers to the stability of a study's findings over time and under the conditions of a study. Researchers' findings should be consistent with the raw data. Dependability is present when other researchers review the raw data and reach similar findings, interpretations, and conclusions. In qualitative studies, researchers strive to establish dependability by avoiding their biases and maintaining objectivity (Birt et al., 2016). Squires and Dorsen (2018) suggested that a researcher can implement a process of double coding to confirm dependability. Double coding is a process wherein a researcher codes a set of data, and then after some time, the same researcher returns and codes the same data set again and compares the results of the two codings. Reaching the same results is an indicator that the study findings are dependable. I used the double coding technique to strengthen the dependability of findings.

Other strategies researchers use to achieve dependability are member checking and reflexive journaling (Moon, Brewer, Januchowski-Hartley, Adams, & Blackman, 2016). Reflexivity is a self-assessment of subjectivity to reduce bias and increase

dependability by increasing transparency of the research process (Korstjens & Moser, 2018). I used a reflexive journal to develop transparency in decision making and question my assumptions during the research process. Member checking is a technique researchers use to mitigate biases by allowing the participants to validate and confirm an interpreted summary of their responses during the interview (Caretta, 2016; Fusch & Ness, 2015). I implemented the member-checking technique to ensure an accurate interpretation of the participants' interview responses.

Credibility

Credibility is the extent to which a research study's findings connect with reality to establish the truth of the findings. To ensure credibility of the findings, researchers can use triangulation and member checking. I used member checking and provided participants with summaries of my interpretation of their responses during interviews to ensure the accuracy of interpretations. Methodological triangulation involves using more than one data collection method to confirm the findings of the study (King & Mackey, 2016). I implemented methodological triangulation to ensure credibility by comparing the interpretation of interview responses with the analysis of the data collected from reviewing related company documents.

Confirmability

Confirmability refers to the degree to which the findings derive from participants' responses rather than the researcher's presumptions and biases (Hays, Wood, Dahl, & Kirk-Jenkins, 2016). Qualitative researchers achieve confirmability by using an audit trail, reflexive journal, and triangulation (Carnevale, 2016; Hays et al., 2016). Audit trails

are in-depth record-keeping methods wherein researchers transparently describe the

activities of the data collection and data analysis processes to show that the findings

emanated from the participants' narratives (Hadi & José Closs, 2015; Korstjens & Moser,

2018). I maintained an audit trail during the research process and illustrate the data

collection process, the coding process, and clustering codes to form themes. I mitigated

bias by using a reflexive journal to document observations not captured on the audio

recordings. I implemented methodological triangulation to ensure confirmability by

converging participants' responses interpretation to the analysis of related company

documents. Another facet of validity is transferability.

Transferability

Transferability is the degree to which a researcher provides readers with evidence

that the findings of a study apply to similar organizations. Researchers improve

transferability by providing a thick description of the phenomenon under study (Hadi &

José Closs, 2015). A researcher provides thick description by explaining plentiful details

about the context of the phenomenon under study, data collection techniques, and data

analysis methods (Yin, 2018). The richness of the research findings enables other

researchers to evaluate the extent to which the study findings are transferable to other

contexts, situations, and populations (Amankwaa, 2016). I provided thick descriptions to

enable future researchers or SME owners in different organizations to understand the

strategies that SME owners use to implement cloud-based ERP systems to improve

company performance and growth.

Data Saturation

Data saturation in qualitative research is a criterion for discontinuing data collection and data analysis (Fusch & Ness, 2015). Researchers can reach data saturation by asking participants probing questions, using member checking, and implementing methodological triangulation (Hennink et al., 2017; Nelson, 2017; B. Saunders et al., 2018). A researcher reaches data saturation when collecting additional data will not result in new interpretations, codes, or themes (Lowe et al., 2018). Researchers use member checking to allow the participants to validate an interpreted summary of their responses to the interview questions (Caretta, 2016; Fusch & Ness, 2015). Methodological triangulation is a process a researcher uses to cross-check interpretations of interview data with data collected from related company documents (King & Mackey, 2016). I reached data saturation through conducting semistructured interviews, asking probing questions during interviews, and using member checking. I implemented methodological triangulation by collecting data from interview responses and documentary evidence. I continued to collect data until no new themes or patterns emerge. I reached data saturation after conducting four interviews and reviewing documents from four participants, no new themes emerged when analysing the responses of the fourth interview.

Transition and Summary

In Section 2, I explained my role in the research, described the target population, listed the participant selection criteria, and discussed the research method and design. I addressed the data collection instruments and techniques and the approach to data

organization. Also, I detailed the data analysis process, and I identified how I correlated key themes with the literature and the conceptual framework. I closed Section 2 with an explanation of the processes I implemented to ensure reliability and validity of the study findings. In Section 3, I include the findings of my research, their application to professional practice, and my recommendations for ways SME owners might use the findings to improve company performance and growth by using cloud-based ERP implementation strategies. Section 3 concludes with an analysis of the implications for social change, my reflections, and a concluding statement.

Section 3: Application to Professional Practice and Implications for Change

Introduction

The purpose of this qualitative multiple case study was to explore strategies that SME owners use to implement cloud-based ERP solutions to improve business performance and growth. SME owners fail at a rate of 65% to 70% in successfully adopting and using a cloud-based ERP system (Saeed et al., 2017). Some SME owners lack strategies to implement cloud-based ERP systems to improve performance and growth (S. Gupta, Misra, et al., 2018; Mahmood, Khan, & Bokhari, 2019). In this study, I explored successful strategies SME owners can implement for improved company performance.

Based on the conceptual framework, literature review, and data collected and analyzed, the following themes emerged: (a) top management support for IT implementation, (b) requirements identification, (c) software selection, (d) user involvement, (e) project management, (f) change management, and (g) post-implementation performance monitoring. The following subsections include a presentation of the findings and identified themes, applications to professional practice, social change implications, recommendations for action and further research, and my reflections and conclusion.

Presentation of the Findings

One overarching research question guided this study: What strategies do SME owners use to implement cloud-based ERP solutions to improve business performance and growth? I interviewed four SME owners with experiences in successfully

implementing a cloud-based ERP system using semistructured interviews with open-ended questions. Also, I reviewed companies' implementation documents, plans, and requirements as archival documents for triangulation. Participants' interview responses and companies' documents enabled me to address the research question. I used NVivo 12 analysis software to code and organize the interview transcripts, company documents, and all other data as well as to classify all relevant data into themes. The seven dominant themes that emerged from the data analysis were (a) top management support for IT implementation, (b) requirements identification, (c) software selection, (d) user involvement, (e) project management, (f) change management, and (g) post-implementation performance monitoring.

Theme 1: Top Management Support for IT Implementation

Top management support refers to the activities done by top management to back a project or an initiative (Lo, Wang, Wah, & Ramayah, 2016). For all the four participants, this strategy was effective, as each participant was fully supporting the implementation of a cloud-based ERP system by providing the needed resources, motivating users to adopt the new system, and reviewing business processes to fit the new system. Table 1 depicts the frequency of the theme top management support in the two data sources, participants interview responses and company documents. There were 23 references to top management support for successful implementation of cloud-based ERP systems.

Table 1

Top Management Support for IT Implementation (Frequency)

Source	Number of References
P1O1	4
P2O2	7
P3O3	3
P4O4	3
D2O1	3
D2O2	3
D1O4	4
Total	23

Three SME owners stated that top management support was needed to allocate the needed resources for the project and push forward the implementation and the adoption of the new system. Two SME owners said management backing of every step of system implementation ensures the effective resolution of obstacles and challenges faced during implementation. Two SME owners noted that strategic decision making by the SME's top management is a critical success factor for the implementation of new technologies in a company. P1O1 stated, "I personally was following up on the project, pushing forward on every task. I was in the meeting when selecting our ERP provider; I approved all business processes drawn by our department management." P1O1 further said, "I also reassigned some tasks for employees to focus on the implementation project." P1O1 stressed the role of top management support to successfully implement a cloud-based

solution; he said, "I think it is crucial to have top management support to achieve success in this project."

P2O2 stressed the importance of allocating the needed resources for the project and hiring external expertise to put projects on track. P2O2 stated, "I supported this project by providing all the needed time and hiring a business analyst and asking [the] department head to put this project as a priority because it will make their work easier after implementation." P2O2 said, "I was really focused on doing the implementation; I provided the needed resources, set up the needed budget, reviewed the project plan, and was always aligning the ERP implementation with our company's strategies and automation process." The technical specification document, D2O2, contained planned tasks for P2O2 during the implementation project including assigning resources, confirming the budget, and approving the project plan. Also, P2O2 discussed that top management has an important role in handling resistance from employees during the transition to the new system. P2O2 stated, "The role of top management is to provide the necessary resources for employees to easily adopt the new system from communication, training, changing processes, and continuous follow-up and support."

P3O3 was involved in all implementation phases. P3O3 stated, "I know all our operations, so I was capable to write a short description of our requirements." P3O3 further said:

I was supporting the implementation of the system. I communicated clearly the importance of the implementation, I reduced some tasks for department managers

to focus on the implementation and spend the needed time on follow-up with the

users and making sure they are adopting the system correctly.

Also, P3O3 said, "End-users' attitude toward the new system actually determines

adoption or denial. If they decided to adopt the system, the system will be implemented.

And of course, us, as top management need to motivate and push their decision to adopt."

Finally, P4O4 discussed the role of top management support in successfully

implementing a cloud-based ERP solution. P4O4 posited, "We know that implementing

an ERP system will change the way people work. Top management has to support the

implementation and explain the reasons for implementation and how the company and

employees will benefit." Also, P4O4 commented, "The strategic factors include

migrating process from current old systems, how adaptable is the company's business

model, top management support, project schedule, and plans." P4O4 considered the role

of top management support as a critical success factor in successfully implementing a

cloud-based ERP solution.

My review of company documents supported comments by participants regarding

successfully implementing cloud-based ERP systems. The project plan documents of two

organizations, D2O1 and D1O4 and technical specifications of D2O2 contained planned

tasks for SME owners in the implementation project. The tasks reflected that top

management was involved in the planning of the project, software selection, and

approving project milestones. In D2O1, the SME owner, P1O1, was responsible for

approving the requirements document, process reengineering plan, and the

implementation strategy. In D1O4, the SME owner, P4O4, was responsible for approving

the requirements document, hiring an expert, approving the process reengineering plan, and approving the implementation strategy. D2O2 revealed the SME owner P2O2 hired an expert, approved the requirement document, and approved vendor selection.

The results of the current study support findings by previous researchers. Hassan (2017) discussed that top management is a link between individual and organizational adoption of IT systems innovation. Shee, Miah, Fairfield, and Pujawan (2018) reported that top management support plays a critical role in the ability of technological innovation to create value in organizations, and in the adoption and of technology in organizations (Hsu, Liu, Tsou, & Chen, 2019). Top managers are responsible for creating, supporting, and providing the needed resources for implementing new technologies (Rahimah & Aziati, 2017). Also, top managers are responsible for the integration of resources and re-engineering of the business model, if required, by the implemented digital transformation (Rahimah & Aziati, 2017). The involvement and direction of top management provide the motivation needed to successfully carry out an ERP implemention (Al Rabeay & Sherif, 2019). All participants agreed that top management support is a critical success factor in implementing IT projects and can significantly improve projects success rate.

The attitudes of top managers in organizations are likely to mediate the relationships among all the five attributes of innovations and the adoption decision (Rogers, 2003). Top management in organizations implementing an innovation has the role to influence individuals by communication the innovation to them, training the users on how to use it, and by applying normative pressure to use it (X. Wang & Dass, 2017).

Top managers' influence on employees' adopting decisions has been explored in research (Hsu et al., 2019; X. Wang & Dass, 2017). Top management support can improve successful rate of innovation implementation project by motivating employees to adopt and accept the innovation. Also, researchers discussed the need for top management when implementing Six Sigma projects for organizational improvement (Abhilash & Thakkar, 2019; Galli & Kaviani, 2018; Westgard & Westgard, 2017). Top managers are responsible for planning and controlling change management processes in organizations to reduce employees' resistance when implementing Six Sigma (Galli & Kaviani, 2018). Top management support can motivate employees and reduce challenges to implement Six Sigma projects in organizations.

Theme 2: Requirements Identification

Participants indicated that identifying requirements for an ERP solution is a successful strategy for implementing a cloud-based ERP solution. The process of identifying and eliciting requirements is a critical success factor of ERP system implementation (Osman & Sahraoui, 2018). SME owners understand the impact of implementing IT to improve company performance and growth (Foroudi, Gupta, Nazarian, & Duda, 2017). The process of identifying requirements reduces risks of ERP implementation failure and guides the software selection process (Hasheela-Mufeti & Smolander, 2017). For all four participants, this strategy was effective, as each participant mentioned identifying needs and requirements as the first phase of the cloud-based ERP implementation project. Table 2 depicts the frequency of the theme identifying

requirements in the two data sources, participants' interview responses and company

documents.

Table 2

Requirements Identification (Frequency)

Source	Number of References
P1O1	4
P2O2	7
P3O3	4
P4O4	5
D1O1	1
D1O2	1
D1O3	1
D3O4	1
Total	24

Table 2 indicates there were 24 references to identifying requirements for successful

implementation of cloud-based ERP systems. Two SME owners hired external experts to

carry out the requirements identifying process. All four SME owners stated that

identifying business requirements is a critical success factor for implementing a cloud-

based ERP solution. All four SME owners made sure that the requirements were

documented and used to procure the suitable software for the SME.

P1O1 stated, "My first task in automating the company's workflow was to

identify our needs and requirements." P1O1 further narrated, "I organized brainstorming

sessions with department heads and requested them to document their departments' needs in simple words. I also asked the managers to ask their employees and involve them in the process of collecting requirements." P1O1 made sure that the requirements were written and used to select the right software for the SME by commenting, "We consolidated the requirements into one document and started looking for solutions." P1O1 considered identifying requirements as a critical success factor for cloud-based ERP system implementation, "First, one should define the project scope correctly. We defined our project scope by writing down our requirements and needs: what we should automate in terms of departments and processes and which employees should be responsible for this implementation."

P2O2 noted, "We hired a business analyst experienced in software engineering. Her task was to consolidate and analyze the business requirements into one requirement document." P2O2 explained how the business analyst implemented the process of identifying requirement:

> The business analyst drew wireframes of each screen that the departments will use; she showed the wireframes to each department head and took feedback and approval on each. So after several sessions between department heads and the business analyst, the output was a detailed requirement document and wireframes for the needed system.

P2O2 used the requirements document to select the suitable ERP system for the SME, "The next step was to select a cloud-based ERP system that matches our requirements."

P2O2 further revealed, "Using our requirements document, we were able to customize and configure the ERP to match our business processes."

P3O3 stated, "Our strategy for implementing the cloud-based ERP system was to know and define our needs for the system." P3O3 also declared, "Once we defined our requirements, it will be easier to compare software programs and choose the right solution." P3O3 considered that identifying requirements is a critical success factor for the implementation of cloud-based ERP system, "From my experience, in our cloud-based ERP implementation, the critical success factors can be summarized into knowing and defining your requirements." P3O3 wrote the requirements document to identify the needs of the organization in implementing the new system. P3O3 stated, "I know all our operations so I was capable to write a short description of our requirements."

Finally, P4O4 concluded, "Our strategy for implementing the ERP system was first to understand what system we want, what are the features of the system that we want, shall it be cloud-based or on-premise." P4O4 hired an external expert to collect and write requirements. P4O4 summarized:

> First phase is planning and requirements collection. We have to write down our processes and indicate the inputs and outputs. We have to draw the workflows and how activities are executed between departments. The expert was the project manager who was responsible for consolidating the requirements document and drawing the workflows.

P4O4 used the collected requirements to select the right software for the organization, and remarked, "Before selecting a solution, we need to know what our functional and

business requirements are and which system will match our requirements." Also, P4O4

mentioned identifying requirements as a critical success factor for implementing the

cloud-based ERP solution, "The critical success factors were identifying requirements,

selecting the suitable system, project management, adjusting your processes to be ready

for automation, and change management including user involvement and user adoption."

My analysis of the company documents indicated that all participants listed

functional requirements in the requirements document. D1O1, D1O2, D1O3, and D3O4

contained SME functional requirements for a cloud-based ERP solution. The functional

requirements mentioned (a) the business's workflows to be automated, (b) the data entry

screens, (c) transactions, and (d) workflows. All documents included a textual description

of the functional requirements. D1O2 contained drawings of wireframes and D3O4

contained drawing of business workflows. Depicting requirements through the use of

wireframes or workflows can increase the visibility of information to stakeholders and

enhance the level of effectiveness of communication in software projects (Tu, Tempero,

& Thomborson, 2016).

The participants affirmed findings from previous literature. Identifying

requirements consists of analyzing business processes and selecting which processes to

automate by software implementation (Abdul Hakim, Saputri, Warang, & Sfenrianto,

2019). García-García, Urbieta, Escalona, Rossi, and Enríquez (2017) noted the process of

identifying requirements defines the functions of the system to procure or develop. SME

owners should base the selection of the ERP solution and the implementation plan on the

identified requirements (Olson et al., 2018). SME owners should select an ERP solution

with features and functionalities that match the business and functional requirements of

the SME (Ogunrinde et al., 2017). In implementing cloud-based ERP systems, SME

leaders should avoid customizations that lead to source code changes but choose a

solution that match the business and functional requirements (Ibrahim et al., 2019). The

theme supports the literature review where several researchers reported that the strategy

for identifying requirements is a critical success factor for implementing a cloud-based

ERP solution (AlBar & Hoque, 2019; Jayatilleke & Lai, 2018).

The study's framework, Rogers's DOI theory, is also highlighted by this theme,

identifying and understanding business requirements is needed to determine the features

and capabilities of cloud-based ERP solution to achieve company goals. Relating to the

conceptual framework on the diffusion of innovation, this theme is consistent with

Rogers' (2003) statement that the initial stage of adopting a new technology or

innovation starts with identifying and prioritizing the organization's needs and problems

to locate the potential usefulness of the new technology. Hameed and Counsell (2014)

indicated that compatibility with organizational needs and business workflows lessens the

adopters' resistance to an innovation. Identifying requirements and business needs is

important for SME owners to understand the determinants affecting the decision to

implement a specific system (Rogers, 2003).

The implementation of the Six Sigma approach depends on proper identification

of business requirements to improve quality and performance (Silva, Mergulhão,

Favoretto, & Mendes, 2019). Company leaders incorporating Six Sigma methods can

develop a quality management system by defining the business requirements for each

area of improvement (Westgard & Westgard, 2017). Laureani and Antony (2019) discussed that company leaders could start implementing Six Sigma approach to improve business processes by identifying the requirements for business improvements and defining the performance indicators to monitor. The study's framework, Six Sigma, is highlighted by the theme of identifying and understanding business requirements to determine areas of improvements that top managers will monitor using the cloud-based ERP solution.

Theme 3: Software Selection

Participants discussed that the software selection process is a successful strategy for implementing a cloud-based ERP solution. Company leaders should review and analyze the characteristics of different ERP systems to make the right choice in accordance with the organization's objectives and business requirements (Borissova, Mustakerov, Korsemov, & Dimitrova, 2016). For all the four participants, this strategy was effective, and two participants mentioned software selection as a critical success factor in implement a cloud-based ERP system. Table 3 depicts the frequency of the theme software selection in the two data sources, participants' interview responses and company documents. Table 3 indicates there were 23 references to software selection strategy for the successful implementation of cloud-based ERP systems. All four SME owners made sure to read customer reviews and test a demo version of the software before selecting the cloud-based ERP system to implement in their companies.

Table 3

Software Selection (Frequency)

Source	Number of References
P1O1	3
P2O2	5
P3O3	6
P4O4	5
D2O2	1
D3O2	1
D2O4	1
Total	23

P1O1 stated, "We started to research our cloud-based ERP match using Google and Capterra, which shows reviews of software for [a] specific industry." P1O1 further narrated, "We short-listed five software and started to read the reviews, read about the features, requesting demos from the vendors, and focusing on how the software will cater [to] our needs." P1O1 made sure that to select a cloud solution for its scalability, cost-effectiveness, and mobility. P1O1 noted, "We selected cloud-based solutions for its scalability, cost-effectiveness, and because of the idea that we do not need to employ an internal IT team to take care of our systems, servers, data backups, and security." P1O1 made sure to test the software and implemented some workflows on the selected software before purchasing the software, "I had several meetings with my managers and tried to configure several of our workflows on the demo access the vendor provided."

P2O2 explained that the software selection process should come after identifying

the business requirements, "The next step was to select a cloud-based ERP system that

matches our requirements." P2O2 narrated, "We did a lot of research with the help of the

business analyst, and we explored several cloud-based systems reading features, reviews,

white papers, and viewing online demos." P2O2 explained that the selection process was

based on (a) matching the identified business requirements, (b) software customizability,

(c) existing successful stories, (e) interoperability, (f) and resources' expertise in the

selected software. P2O2 narrated, "We chose Dynamics because it matched our business

requirements, it is customizable to our needs, it has a lot of successful stories, and our

business analyst has two experiences in implementing Dynamics to other companies."

Also, P2O2 noted, "We had to research, view demos, and test to select the suitable

system. We wanted a customizable and configurable system that is interoperable with

other systems."

P3O3 compared featured from different cloud-based ERP systems in the software

selection process and looked for providers with successful implementations in the same

industry, gyms. P3O3 stated, "I started using Capterra to read reviews of different SaaS

gym systems. Capterra [has] a nice feature to also compare the offerings between two

software. I was looking for a system that would be future-proof." P3O3 also declared,

"We chose to go with a SaaS solution that is made locally. The software company

making the SaaS is a small company but with several successful implementations in local

gyms." Also, P3O3 requested a demo version to validate the software selection process,

"After selecting the software, we asked for a demo version for our only access to fill the

needed information and test the software to see how much it matches our business

processes and requirements."

P3O3 explained the decision to select a cloud-based ERP system over an on-

premise ERP system. P3O3 narrated, "Going to the cloud was convenient for our

operations; we had two branches around 20 kilometers far from each other. We do not

have any IT infrastructure, no servers, no data centers, no storage hardware." P3O3

further commented, "We had to choose between investing in IT infrastructure buying

servers, UPSs, routers, network setup, data security tools, software licenses for operating

systems, recruiting IT personnel and between using [the] cloud." P3O3 concluded, "The

cloud was more convenient, especially that our selected vendor uses AWS cloud, which

is famous for its quality, up-time, and services." P3O3 stated that company leaders could

focus more on core business processes by selecting a cloud-based system:

> Using the cloud, we did not have to plan for any IT infrastructure setup, we did
>
> not have to recruit any IT personnel, and we did not have to worry about any
>
> technical challenges or activities. We want to concentrate on our core business
>
> processes so let the cloud providers do the IT works for you.

P4O4 searched for software which is flexible and matches their business

requirements. P4O4 stated, "We selected SAP for its flexibility and rich features. Plus,

our expert has experience in SAP implementation." P4O4 declared, "Most cloud-based

applications enable companies to test or pilot the application first, to ensure there is

business value in the application." P4O4 explained that it is risky to select a software

without test driving the software before procurement. P4O4 explained the decision to

select a cloud-based ERP system over an on-premise ERP system. P4O4 narrated, "We evaluated the total cost of ownership for both a cloud-based solution and an on-premise solution. On-premise requires one big investment, while cloud computing is about recurring costs." P4O4 further commented:

> But on-premise solutions require not only the purchase of the software, but also require support costs that are typically 18 to 20% of the license as well as additional hardware, personnel for maintenance and support, network monitoring, management tools and more.

P4O4 concluded, "Cloud-based applications require less coding or customizations, are simple to scale as your business needs change, are easily configurable, and have more flexible integration options."

Three participants shared with me the technical documents they used during the software selection process. My review of the company documents indicated that the three participants, P2O2, P3O3, and P4O4, selected their cloud-based ERP software based on the software's rich features: (a) flexibility, (b) configurability, (c) availability to test, (d) existing success stories and customer reviews, (e) and interoperability. The three documents included the technical features of the cloud-based solutions and success stories. The three documents contained screenshots from the system and technical specifications on deployment models, data security, and back-up scenarios.

The participants affirmed findings from previous literature. Using cloud-based software in companies has the benefits of (a) scalability, (b) interoperability, (c) flexibility, and (d) mobility (Joe-Wong & Sen, 2018). Company leaders who use cloud-

based solutions can focus on innovative service creation while depending on the software provider for any technical support or requirement (Retana et al., 2018). Also, selecting a cloud-based solution over on-premise solutions is cost-effective. Zadeh et al. (2018) discussed that cost-saving motivators, such as infrastructure cost savings, are attracting organizational leaders to adopt cloud-based ERP solutions. Participants were looking for systems that are customizable for their business requirements. Botta et al. (2016) explained that SME owners should seek cloud-based ERP vendors with high customization capabilities to match their automation requirements.

Relating to the conceptual framework on the diffusion of innovation, this theme is consistent with Rogers' (2003) two attributes of innovation, compatibility and trialability. Participants sought software that matches their business requirements, and participants requested to try and test the software before making the decision. The compatibility attribute relates to the software selection strategy as participants sought software that is compatible with the business processes. Also, trialability relates to the software selection strategy as participants requested to explore and try the software before adopting it. Giving potential adopters to explore and try an innovation before adopting it will increase the rate of innovation adoption (Dearing & Cox, 2018). The implementation of the Six Sigma approach depends on proper tools to improve quality and performance. Westgard and Westgard (2017) discussed that company leaders incorporating Six Sigma methods need to select suitable software to measure and monitor processes' metrics. The study's framework, Six Sigma, is highlighted by the theme of software selection by implementing a system that matches a company's business requirements.

Theme 4: User Involvement

Participants explained that user involvement during the implementation of a cloud-based ERP solution is a successful strategy. Users should know the business processes related to their functional units and their involvement is required to confirm the correct implementation of the current business processes in the ERP system (Bano et al., 2017). For all the four participants, this strategy was effective, and all four participants mentioned user involvement as a critical success factor in implement a cloud-based ERP system. Table 4 depicts the frequency of the theme user involvement in the two data sources, participants' interview responses and company documents. Table 4 indicates there were 23 user involvement strategy references for the successful implementation of cloud-based ERP systems. All four SME owners made sure to involve users in the requirements collection process and testing of the system to reduce user resistance and ease the user adoption process.

Table 4

User Involvement (Frequency)

Source	Number of References
P1O1	4
P2O2	8
P3O3	7
P4O4	3
D2O1	1
D1O4	1

Total	23

P1O1 stated that employees were involved in the requirements collection process:

I also asked the managers to ask their employees and involve them in the process

of collecting requirements. This is important to involve all employees and give

them a chance to elaborate their tasks and how they wish to apply it on a system.

P1O1 further explained, "The department managers were communicating the updates to

the departments' employees and demonstrating to users how to use the system." P1O1

noted, "Our employees are the ones who did the implementation. Some employees were

assigned to collect requirements and draw the business processes on the system. These

people know the current processes inside and out." P1O1 made sure that the employees

receive training on the new system. Also, the training process involved department

managers training their employees. P1O1 narrated, "Each department manager was

assigned the training for our department employees." P1O1 explained how the

department managers were involved in implementing the system in their departments:

The department managers coordinated with the administrator to configure the

workflows in the system and tested the system on different department processes

and then they held a number of demonstrations with their employees to train them

on how to use each process and train them on how to carry their tasks and

responsibilities on the system.

P2O2 explained that the requirements collection process involved the users, "We

collected requirements from all of our department heads: sales, production, procurement,

and finance." Also, P2O2 made sure to involve the user in the implementation and

training phases. P2O2 stated:

> The business analyst did a hands-on training where the users used the system and
>
> gave feedback. The feedback was collected and discussed with the business
>
> analyst and the department heads and myself, where we did some changes to
>
> make it easier for users to use the system.

P2O2 discussed that user adoption is a challenge when implementing a new system and

involving users in the implementation phases to tackle implementation challenges. P2O2

narrated, "It is important to depend on the support of employees during ERP

implementation. They must be involved in the process to understand the need for change,

and leaders must always be available to address their queries and challenges."

P3O3 explained, "The perception of end-users toward the new cloud-based ERP

system is a critical success factor for adoption." P3O3 further narrated, "End-users

attitude toward the new system actually determines adoption or denial. If they decided to

adopt the system, the system will be implemented." P3O3 made sure that the users train

on the system and test the system before implementation. P3O3 states, "By testing, the

end-users experienced the system in a limited area. It was important to test the system

and understand its functions." P3O3 communicated the benefits of the new system, "The

department heads used the method of compare and contrast showing end-users what are

the benefits and advantages of the system compared to using spreadsheets." P3O3 further

noted, "They showed the users that [they] will be doing [their jobs] in less time and

[they] will have better tools for data extractions." P3O3 was able to reduce resistance

with the communication strategy, "We were able to convince the end-user that using the system to do your job is better than using the old methods."

Finally, P4O4 discussed that the user involvement strategy, "We focused on communicating the strategy of the company and the benefits of the new system, we focused on involving employees with the data collection process, allowing the employees to test the system before going live." P4O4 made sure to involve users in the requirements collection phase, data migration phase, and testing phase:

The users were involved in the requirements collection phase; were we asked for details about their activities and daily tasks. We involved the users in the data migration phase to review data and confirm that it is clean. We involved the users in the testing phase and asked about how much easy is it to use the new system and what do they need to customize or change.

My review of company documents concluded that the participants involved users in the implementation project. The project plan documents of two organizations, D2O1 and D1O4, contained planned tasks for users. In D2O1, the plan included sessions with users from different departments to collect requirements. Also, the plan included demonstration sessions and training sessions for the users. In D1O4, the plan included events for requirements collections involving all users. Also, the plan included data migration review by users. Finally, the plan included sessions to test the system by all users and to get back user feedback on how to make the system easier.

The participants affirmed findings from previous literature. Menon et al. (2019) discussed that company leaders should involve users during the requirements collection

and the ERP implementation phase. During the ERP implementation phase, company leaders should involve users to confirm the correct implementation of the current business processes in the ERP system (Bano et al., 2017). ERP implementation may require changing of business processes (Al-Taweel & Haithm, 2016), and the user involvement process could improve user adoption of the changes in process (Dobrovič, & Timková, 2017). User involvement could facilitate the transition to a cloud-based ERP solution where employees are communicated the advantages and benefits of using the new system (S. Gupta, Kumar, Singh, Foropon, & Chandra, 2018). User involvement in requirements collection and during the implementation phase is a cloud-based ERP implementation strategy that could facilitate implementation and user adoption of new technology.

Relating to the conceptual framework on the diffusion of innovation, this theme is consistent with Rogers' (2003) attributes of relative advantage and trialability. User involvement is positively related to innovation adoption and implementation of change (Engle et al., 2017). Relative advantage refers to users' perception that the innovation could improve their job performance (Howard, Restrepo, & Chang, 2017). Company leaders communicating the benefits of the new system and involving users in the implementation phase is an effective strategy to convince users with the relative advantages of the implementation of new systems (Yadegaridehkordi et al., 2018). Researchers indicated that employees participating in the testing of a system, the employees are inclined to accept and use the system (Bhattacharya et al., 2019; (Mohammadi et al., 2017). Users involved in testing is aligned with Rogers' trialability

attribute of innovation. Company leaders allowing potential adopters to test an innovation will facilitate innovation adoption (Dearing & Cox, 2018). Furthermore, Bhattacharya et al. (2019) proposed that ERP implementation strategy of user involvement promotes the impression of responsibility and ownership towards a successful implementation for employees.

Moreover, user involvement strategy relates to Six Sigma. Company leaders should establish data-driven measurement criteria to monitor processes' performance (Westgard & Westgard, 2017). To implement Six Sigma, company leaders should use strategies for defining business requirements by involving users (Alkinaidri & Alsulami, 2018). Involving users in Six Sigma implementation can increase employee satisfaction, improve organizational performance, and facilitate the implementation of organizational change (Pugna, Negrea, & Miclea, 2016). Company leaders should plan for employee involvement to implement Six Sigma for employees to understand their role and the role of the new systems in quality improvement.

Theme 5: Project Management

Participants discussed that project management during the implementation of a cloud-based ERP solution is a successful strategy. Liao et al. (2018) explored the use of project management as a strategy in ERP implementation to manage resources, activities, scheduling, budget, and risks. For all the four participants, this strategy was effective, and all four participants mentioned project management as a critical success factor in implementing a cloud-based ERP system. Participants discussed how they implemented the project management strategy to (a) assign resources for implementation, (b) select an

implementation approach, (c) plan and execute data migration, and (d) train employees.

Table 5 depicts the frequency of the theme project management in the two data sources,

participants' interview responses and company documents. Table 5 indicates there were

43 project management references for the successful implementation of cloud-based ERP

systems.

Table 5

Project Management (Frequency)

Source	Number of References
P1O1	7
P2O2	20
P3O3	6
P4O4	7
D2O1	1
D2O2	1
D1O4	1
Total	43

P1O1 managed to use internal resources for the implementation and assigned

specific tasks for each employee, "Each department manager was responsible for

configuring the flows of the department on the system." P1O1 appointed one employee as

an administrator of the system to handle system configuration, cloud backups, and system

security. P1O1 stated:

We appointed one employee as with an administration access. The administrator

was responsible for several things: configuring the cloud-based ERP, drawing the

workflows of business processes provided from each department and approved by

management, [migrating data] by importing the data in the excel files, taking a

local copy of the data backup, and creating users and specifying roles and

permissions.

P1O1 noted, "The administrator was trained on the system using training videos and

asking questions to the company support." P1O1 mentioned that the department

managers were responsible for training the users, "Each department manager was

assigned the training for our department employees." P1O1 explained the training

procedure done by the department managers, "They held a number of demonstrations

with their employees to train them on how to use each process and train them on how to

carry their tasks and responsibilities on the system." P1O1 tackled data migration by

determining the useful data to migrate to the new system, "Since we do not have an

existing system, data migration was about importing excel sheets containing client

details, orders, and employees. We only migrated opening accounts in accounting and not

all of the previous transactions."

P1O1 chose a phased-implementation approach, "The implementation was done

in phases, we implemented first the CRM and sales, then the HR, and then we

implemented the production cycle, and finally the accounting." P1O1 further explained,

"Using phased implementation strategy, we were able to focus on each process and

automate it in the system." P1O1 started implementation with the least interrelated

modules, "We started implementing parts of the system that rely on the least number of modules like CRM, sales, and HR. The last department was the accounting department since all subsystems will post transactions in the accounting system."

P2O2 hired a business analyst with knowledge in software engineering and experience in implementing cloud-based ERP systems. P2O2 stated, "We hired a business analyst experienced in software engineering." P2O2 explained that the experience of the business analyst in Microsoft Dynamics was one of the criteria for selecting Microsoft Dynamics as the cloud-based ERP system. P2O2 mentioned, "We chose Dynamics because it matched our business requirements, it is customizable to our needs, it has a lot of successful stories, and our business analyst has two experiences in implementing Dynamics to other companies." P2O2 assigned the responsibility of the project implementation to the business analyst. P2O2 explained, "Her task was to consolidate and analyze the business requirements into one requirement document. Also, the business analyst drew wireframes of each screen that the departments will use." P2O2 further noted, "Our business analyst was the head of the implementation project. She used Dynamics features to customize the screens, data structures, workflows, and reports." P2O2 stated that the business analyst was responsible for training, "The business analyst trained the department heads with the employees on how to use the system, and there was hands-on training where the users applied real scenarios and examples on the system." Also, P2O2 explained that the business analysis executed a hand-over phase, "Our IT personnel took over the business analyst work. So we had a one-to-one training between the business analyst and our IT guy." P2O2 described the

advantages of the hand-over phases, "This is needed in case we had changes in processes, we can do the changes in the ERP accordingly without the need of an external expert."

P2O2 stated, "The implementation was done in phases; we implemented first the finance module, since we already have an accounting system with existing data going back to a few years ago." P2O2 described that data migration was done for each ERP module in parallel with the module's implementation phase, "We did data migration to the new system and shut down the old system, the finance department started to use the new system." P2O2 further noted, "Finally, we implemented the CRM for the marketing and sales department. We migrated data into the CRM, our prospects and our client profiles." P2O2 explained the planning for data migration, "We planned which of the data must be migrated and [decided] which information flow is crucial for various departments for business operations." P2O2 summed up the phased-implementation approach:

> We used the strategy of phased implementation, where we focused on each company process and configured it in the system. We started implementing parts of the system from bottom to top starting with accounting and last into CRM. We waited until each module was successfully implemented, user trained, and the system is used successfully before switching to the next module.

P3O3 headed the implementation project and assigned department managers the implementation tasks. P3O3 explained, "I know all our operations so I was capable to write a short description of our requirements." P3O3 further stated, "I did the testing myself with the managers of the two branches, accounting, and the technical manager."

P3O3 asked the cloud-based ERP provider to provide online training for the department managers, "The training was done with the help of the company (online). The SaaS provider scheduled a series of demo to train our people how to configure and use the system." P3O3 planned the data migration phase:

> [We reviewed] and [cleaned] out our sheets and documents that needs migration, [and made] sure that the data is correct. Then, we sent the sheets to the SaaS provider as per the templates required for the technical people to do migration.

P3O3 used the *big bang approach* for implementation after completing the training and data migration phase, "At a specific date and time, we did the final migration, archived and locked all of our sheets. And forced the employee to start using the system." P3O3 stated, "We had 15 users directly using the system for sales, management, and accounting. They all started using the system at the same time after data migration is executed."

Finally, P4O4 hired an ERP expert with experience in implementing ERP systems as the project manager for the cloud-based ERP system implementation project. P4O4 stated, "We hired an ERP expert with experience in implementing ERP system to help us in the transition." P4O4 noted that the experience of the expert in SAP ERP systems was one of the criteria for selecting SAP as the cloud-based ERP system. P4O4 mentioned, "We selected SAP for its flexibility and rich features. Plus, our expert has experience in SAP implementation." P4O4 further explained, "The expert was the project manager who was responsible for consolidating the requirements document and drawing the workflows." P4O4 explained the training process:

We trained the department heads to be the trainers for their employees and help

them learn on the system. It is the responsibility of department heads to have the

employees adopt the system and do their activities on the system.

P4O4 mentioned described the challenges in the data migration process:

Since we do not have an existing system, and all our data is on Excel sheets, we

had problems to know what the correct data is and what is updated correctly and

who did the last update. Spreadsheets do not have versioning or ownership and it

is difficult to apply collaboration and sharing in excel sheets.

P4O4 used the phased implementation approach, "After confirming that all processes are

configured correctly and the users are trained on the system, we started to go live. Going

live was a phased implementation with started with sales and then operations and then

accounting."

My analysis of company documents concluded that the participants followed

project management strategy to successfully implement a cloud-based ERP solution. The

project plan documents of two organizations, D2O1 and D1O4, and the technical

specifications document of one organization, D2O2, listed the tasks, resources, and

timeframe. D2O1 contained the details of the phased implementation approach

confirming P1O1's strategy to start the implementation of the CRM module, then the HR

module, then the production cycle, and finally, the accounting module. Also, D1O4 and

D2O2 contained the details of the phased implementation starting from the

implementation of the sales module, then the operations module, and finally, the

accounting module. Both documents included the activities explained by P1O1, P2O2,

and P4O4: (a) requirements collection, (b) customizing and configuring the ERP system, (c) training, and (d) going live with the ERP system.

The participants affirmed findings from previous literature. Ali and Miller (2017) discussed that training and data migration are critical success factors in project management strategy for implementing an ERP system. The project manager responsible for the implementation of an ERP system must understand the impact of the implementation project on the business processes and select a smooth transition approach (Amalnik & Ravasan, 2018). Also, Parthasarathy and Sharma (2016) discussed that a successful ERP implementation strategy should consider (a) a suitable implementation approach, (b) training plan, and (c) data migration plan. Company leaders can use the *big bang approach* or a phased approach as a technical implementation plan (Ali & Miller, 2017). P1O1, P2O2, and P4O4 used a phased approach, while P3O3 used the *big bang approach*. Using a strong project management strategy with committed resources to execute the implementation and project delivery is a critical success factor for cloud migration (Jones, Irani, Sivarajah, & Love, 2019).

Relating to the conceptual framework on the diffusion of innovation, this theme is consistent with Rogers' (2003) attributes of relative advantage, complexity, and trialability. Participants used training to show how the system can help users to carry out their activities and test the system before adoption to reduce the impact of Rogers' complexity attribute. Rogers defined compatibility as the perceived degree of consistency with the existing work. All participants planned for data migration to increase the compatibility and interoperability between the current systems and the implemented

cloud-based ERP systems. Moreover, the project management strategy relates to Six

Sigma. Company leaders can use the implemented ERP system to develop data extraction

strategies to monitor processes' performance (Westgard & Westgard, 2017). To apply Six

Sigma, company leaders use strategies to successfully implement data-driven criteria to

improve the performance of each process (Alkinaidri & Alsulami, 2018). The

implementation of project management strategies will facilitate ERP deployment and

automate processes, where company leaders can start to monitor processes' performance.

Theme 6: Change Management

Participants discussed that change management during the implementation of a

cloud-based ERP solution is a successful strategy. Change management is a strategy

sustains the relationships between employees, processes, and systems to ensure that

employees realize changes in business processes (Comuzzi & Parhizkar, 2017). For all

four participants, this strategy was effective, and all four participants mentioned change

management as a critical success factor in implementing a cloud-based ERP system.

Table 6 depicts the frequency of the change management in the two data sources,

participants' interview responses and company documents. Table 6 indicates there were

32 change management references for the successful implementation of cloud-based ERP

systems.

Table 6

Change Management (Frequency)

Source	Number of References
P1O1	10
P2O2	6
P3O3	8
P4O4	8
D2O1	1
D2O2	1
D1O4	1
Total	32

P1O1 explained that understanding of the cloud platform was a challenge during implementation, "Another challenge is understanding the cloud platform. We had fears concerning data security, performance, and control." P1O1 had to develop a backup strategy for the cloud system, "The provider securely stored all our data, and we [were] able to take scheduled backups of all of all our data on an offline disk." P1O1 had to learn how the updates of the cloud system work with the help of the ERP vendor, "The provider had full control over the software part which suited us since we do not have an IT team that can work on fixes or updates." Moreover, P1O1 used change management to adjust the current business processes to adapt with the new ERP system, "Another challenge was the significant changes that the software brought in to our company's conventional business model and the day-to-day practices that we have been using for

years." P1O1 noted an example concerning the sales process, "We actually re-engineered our sales process by simplifying the flow of sending quotes, sending reminders, and get approvals on orders." P1O1 explained, "Our business processes were reviewed and enhanced by reducing repetitive work through ERP integration." P1O1 developed a change management strategy to tackle the mind-shift transition obstacle. P1O1 explained:

> The users of the system are humans who were used to processes being one way and will more likely find it hard to switch to a new way of doing things, especially if the benefit of the new methods is not immediately obvious.

P1O1 communicated the advantages of using the system to overcome the transition challenges. P1O1 noted, "We did presentations and training and issued policies to help users understand the importance of using the system." Moreover, P1O1 implemented the change management strategy by changing business operations to achieve a seamless transition to the new system. P1O1 explained, "We told employees not to use e-mails to communicate regarding work, all the information the employee needs should be in the system." P1O1 further noted, "We removed the phones from the desks of the production team, they just need to check the system to know what they will do now." P1O1 concluded, "We had to adjust some of our processes to completely have our processes automated on the system. We believe that the adjustments made improved our processes."

P2O2 explained, "The decision to implement ERP is expected to bring change in working conditions, operating procedures, reporting structure, resource management, and many operations-related activities." P2O2 noted that involving users in the different

phases of implementation to adopt the changes, "It is important to depend on the support of employees during ERP implementation. They must be involved in the process to understand the need for change, and leaders must always be available to address their queries and challenges." P2O2 further stated, "The perception of employees toward adopting and using the new cloud-based ERP system is an important aspect." P2O2 explained, "The role of top management is to provide the necessary resources for employees to easily adopt the new system from communication, training, changing processes, and continuous follow-up and support." P2O2 communicated the advantages of the system to increase user adoption rate:

> We communicated the advantages of the new system to employees and showed them the advantage of using the new system in terms of ease of use, less time to complete the task, and better means and tools to extract the information they need.

P2O2 focused on user satisfaction and ease-of-use, "We wanted our users to be satisfied doing their tasks on the system. We need to make sure that the new system must match the activities of the user." Finally, P2O2 made sure that all concerns raised by employees using the new system are addressed, "The user adoption challenge was solved by hands-on training and daily follow-up from top management to make sure that any issue the employees raise concerning the software is solved or managed directly."

P3O3 explained that the implementation of the ERP created an opportunity to review the current business process:

> The transition from a system of Excel spreadsheets to an ERP solution was a good opportunity to take another look at the processes in place. We evaluated what

information we are currently collecting, how that information is used, and what

additional information would be beneficial.

P3O3 noted, "The features and capabilities provided by ERP systems will surely provide

us with a new lens through which to consider our current processes." P3O3 further stated,

"And for a successful implementation of ERP, the business flows might have to undergo

changes, and the ways people do their jobs will need to change too." P3O3 gave an

example of a changed business process due to the transition to the new ERP system, "The

software [was] able to help in simplifying our sales pipeline with an organized workflow

for managing leads that come into our gym. [The software allowed us to easily] make

calls, log notes, follow-up, and track sales commissions." Also, P3O3 prepared the

employees to adopt the new system:

> Another challenge is [the] team readiness. We had to prepare our people. We have
>
> two types of people to prepare as part of our transition: department heads who
>
> will help in system adoption and process automation, and end-users who do the
>
> data entry.

P3O3 further noted, "We need to get feedback from both of these groups on what they

need out of the new system early in the process, so they remain more invested over the

long run." To make the employees ready to use the system, P3O3 communicated the

advantages of the new system:

> The department heads used the method of compare and contrast, showing end-
>
> users what are the benefits and advantages of the system compared to using
>
> spreadsheets. They showed the users that you will be doing your job in less time,

and you will have better tools for data extractions. We were able to convince the

end-user that using the system to do your job is better than using the old methods.

Finally, P3O3 discussed, "The system is user-friendly and using it proved not to be hard.

I think that [the] user-friendliness of our selected system with proven good user

experience sped up the adoption process for end-users."

P4O4 discussed that business process re-engineering is a part of the ERP

implementation project: "Business process re-engineering is part of the automation

project. Since manual processing adds a lot of waste and recurrent activities. In an ERP

system that integrates your processes, these are reduced." P4O4 further explained, "The

digital transformation step that we took with the ERP solution was a good opportunity to

review our business processes especially what is related to operations." P4O4 gave an

example of how the transition:

> We started to review the excel sheets we use and the data collected. We noticed
>
> that we have a lot of unneeded collected information that is time consuming for
>
> our employees and in the implementation phase we got rid of them.

As another example, P4O4 mentioned, "The ERP system completely changed the details

of the daily activities for employees. For example, SAP ERP has a CRM module where

you can convert a lead to a customer and add an order with one click." P4O4 used a

change management strategy to ease the transition:

> We focused on communicating the strategy of the company and the benefits of the
>
> new system, we focused on involving employees with the data collection process,
>
> allowing the employees to test the system before going live, and a lot of training.

Also, P4O4 trained their users on cloud technology in addition to the new ERP system.

P4O4 noted, "We had training as top managers on cloud computing technology, as

department managers on all aspects of the system and to train the employees. And the

employees to know how to apply their daily activities on the system." Finally, P4O4

noted the communication strategy used to ease the transition:

> We communicated to them the importance of the implementation to the company,
>
> and how the ERP implementation is aligned with the company strategy and
>
> growths. We also communicated that we will leverage the ERP to improved our
>
> performance and quality.

My analysis of company documents concluded that the participants used change

management to successfully implement a cloud-based ERP solution. The project plan

documents of two organizations, D2O1 and D1O4, and the technical specifications

document of one organization, D2O2, listed the change management tasks and activities

carried by top management and the system users. D2O1 contained the details of a task

assigned to department managers to align the business processes with automation. Top

management assigned tasks for each department manager to review current processes and

change processes by reducing repetitive work with the new ERP integration. Also, D2O1

listed training assignments and demonstration activities for department managers to train

employees on how to carry tasks and operations on the system. D2O2 listed tasks for

training employees and scheduling testing sessions with employees. In the training and

testing tasks, employees experienced the potentials of the system and how to carry daily

activities on the system. Also, D2O2 contained scheduled demonstrations to

communicate the advantages of the new system to employees and to show the advantages of using the new system in terms of ease of use. Finally, D1O4 contained tasks where top management assigned department managers to review current processes and existing sheets to remove redundant activities. Also, D1O4 listed scheduled tasks for employee training and testing.

The participants confirmed findings from previous literature. Comuzzi and Parhizkar (2017) defined change management as the set of activities to plan and implement the needed changes to successfully implement a new system. A newly implemented ERP system should be compatible with the business processes and may require company leaders to change business processes (S. Gupta, Kumar, et al., 2018). Also, a change management strategy should consist of planning employee readiness to adopt the change by planning and implementing communication and training plans (Badewi & Shehab, 2016). Company leaders should implement change by communicating the importance of the change, advantages, and the details of the change to employees' routine operations (Y. Li et al., 2017). Mamoghli et al. (2018) discussed that communicating the advantages of new systems and providing training for employees reduces the risks of user resistance. Company leaders should integrate change management strategy with the implementation plan of a cloud-based ERP system to align a company's business processes with the new technology and overcome employee resistance.

Relating to the conceptual framework on the diffusion of innovation, this theme is consistent with Rogers' (2003) attributes of compatibility and complexity. Rogers (2003)

defined the compatibility attribute of innovation as the innovation's compatibility with the current processes of the individuals adopting the change. All participants facilitated the implementation of a new system by implementing a change management strategy to modify or adjust current business processes for alignment with the new system. Also, participants implemented training strategies and demonstrations to reduce the impact of Rogers' complexity attribute. Moreover, change management relates to Six Sigma. Participants used change management strategies to adjust current business processes and reduce redundant activities to be compatible with the new ERP system. Company leaders implementing Six Sigma should involve changing business processes to eliminate waste and drive process quality (Aqlan & Al-Fandi, 2018). Six Sigma is an approach to managing the quality of production and business processes, which includes defining goals for process output, measurement and analysis of output, modification of processes and on-going process control (Saad, Amrin, & Jamaludin, 2019).

Theme 7: Post-Implementation Performance Monitoring

Participants discussed that performance monitoring after the implementation of a cloud-based ERP solution is a successful strategy. All participants mentioned that continuous performance monitoring after ERP implementation is an effective strategy for the successful implementation of ERP. Table 7 depicts the frequency of the post-implement performance monitoring in the two data sources, participants' interview responses and company documents. Table 7 indicates there were 52 post-implementation performance monitoring references for the successful implementation of cloud-based ERP systems.

Table 7

Post-Implementation Performance Monitoring (Frequency)

Source	Number of References
P1O1	10
P2O2	18
P3O3	11
P4O4	10
D3O1	1
D2O3	1
D1O4	1
Total	52

P1O1 noted, "This tool can be used at any stage after the initial implementation process [to enable] continuous business process improvement." P1O1 used the ERP system to monitor the performance of current processes and do changes to enhance performance. P1O1 explained:

> We configured our production process on the system and then monitored in details the workflow for this process. And accordingly, we made some changes to perfect it by reducing some work and data entry that was not necessary for the final output.

P1O1 further noted, "[The] ERP solution provides dashboards that allow for proper decision-making and the performance indicators calculated by the system - triggered improvements in different processes". Also, P1O1 commented, "With the new ERP

solution, we improved and optimized our processes. Now that these processes are integrated, different departments are working together seamlessly, delays due to lack of communication are reduced, information is instantly shared with top management." P1O1 stated that the continuous performance monitoring of current processes using the ERP system can provide top management with data to update the business strategy and improve performance: "The continuous performance monitoring through the ERP provided top management guidance to update the business strategy and enhance overall company performance." P1O1 further mentioned, "The integrated cloud-based ERP system integrated these processes, and showed as performance indicators, and provided instant information in dashboards allowing identification of strengths and weaknesses, and triggering process improvement."

Moreover, P1O1 discussed how the new ERP system improved company performance and growth. P1O1 stated:

> We have improved our sales process. We are able to track our prospects and contact them based on data such as their preferences and communication history. We were also able to better manage our sales team and define conversion rates more accurately.

Also, P1O1 commented, "We have also improved our production process. We enhanced communication between sales department and production department. After the order is confirmed from sales, [the] production department starts working on it directly." P1O1 noted that they were able to reduce production wastes and reduce delivery times:

The process of production is now streamlined, everyone knows what to do based on the workflow configured that generates tasks for each one. Late deliveries are directly detected by managers through reporting. Managers can now directly focus on production problems and understand cause of delays.

Finally, P1O1 concluded, "And after 6 months of implementing the system, we were able to reduce production time, increase the sales, and increase customer satisfaction with better deliveries."

P2O2 used reports from the new ERP system to improve company processes, "Reports were generated, and department heads were able to view important decision-making information and started to plan for optimizing the process and workflow." P2O2 explained how they were able to increase sales and achieve growth, "We were able to increase our sales team since the sales process was now automated. We were able to understand our conversion rates and evaluate our sales strategy." P2O2 further commented, "We were able also to use digital marketing and link our CRM system with automatic email sending and SMS sending as well as Google ads and Facebook ads." P2O2 explained how they the ERP to improve company sales, "After implementing the new ERP system, we were able to acquire more customers. We did that by expanding our sales team and controlling the sales activities from the CRM module in the ERP." P2O2 further commented:

Using the CRM, we were able to focus on important high value activities for my business and use the CRM to track them. We were able to easily distribute sales

activities such as cold calls, lead follow up, trials, quotations, closing calls, and customer maintenance.

Also, P2O2 discussed how they used information from the ERP system to improve performance of salespeople:

We were able to build dashboards so sales people and top management can monitor the number, frequency, and outcome. We were able to track and measure lead indicators of success rather than other indicators such as number of orders and revenue values. We were able to improve the performance of our sales people by automating incentives and showing them their conversion rates to compete against each other and perform better. The conversion rates of our sales people provided us with an objective measure of performance.

Also, P2O2 discussed the performance improvement in the production and procurement processes, "The integration and workflow between production and procurement improved the performance of the process and reduced waste and now have the information of exactly how much raw material we need to cook and serve our clients." Using the cloud-based ERP system, P2O2 was able to improve the quality of processes, "We focused on customer satisfaction and improved it by continuously monitoring performance. Customer satisfaction increased customer loyalty and our attrition rate is decreased." Finally, P2O2 noted, "The ERP helped us improve our quality by elimination of waste, overproduction, and waiting. Our delivery is now more optimized. Our inventory management is more optimized and all extra or manual processing is eliminated."

P3O3 discussed the post-implementation phase and stressed on the advantages of reporting and performance monitoring. P3O3 commented, "I can receive daily reports on my e-mail with the activities I am interested to monitor: monthly sales, sales funnel, sales channels, and attrition rates." P3O3 noted, "I can dive deep into these data and try to change a process or focus on more sales channels to increase sales. I can experiment with my changes and see the results if they lead to improvements or not." P3O3 was able to increase company sales:

> We used the system to know our business process better, to improve it, to experiment some changes and see the results. We were able to improve our sales activities and streamline a sales process to increase our prospects and our customers. We now know what are the best sales channels, what are our attrition rates, and experiment on changes to increase the lifetime of our customers.

Also, P3O3 stated, "We were able to monitor our employees work, our revenues, and our costs in one system." P3O3 further noted, "The integration of data between departments [gave us] a lot of potentials to manage [the] company better in the aim to improve its performance and improve its sales activities for growth and increased revenues."

P3O3 discussed how they were able to increase company sales, "We were able to create campaigns, promote special deals and discounts based on specific criteria like cancelled members or prospects who visited us. We took advantage of the email marketing tools to send emails to the clients and prospects." Finally, P3O3 concluded:

> The implementation of the cloud solution led to the improvement of our quality of service. Also, we gained the factor of speed; speed of business communications,

efficient coordination among teams, better customer communications, and access

to more prospects and channels.

P4O4 noted, "After implementing the ERP system, it was easier for company staff

at all levels, from front end employees and team supervisors to senior executives and

managers to measure company's performance and understand the impacts within the

company." P4O4 explained how the new ERP increased company sales:

We were now able to [improve] our processes, [reduce] waste and repetitive tasks

due to manual processing, and [optimize] the sales process with the new CRM

[that] helped us to enhance our performance and services, sell more, and focus on

our core competencies.

Also, P4O4 stated that the new ERP system helped in improving quality of processes,

"Implementing the system has helped us in: reducing manual processing, focus on our

core competencies, and decreasing customer waiting and increasing the speed to finalize

customer's orders. We increased our customer satisfaction and customer loyalty." P4O4

further commented, "Also, measuring and analyzing data from ERP serves as a core

principle of quality improvement, and using an ERP system, you can select your metrics

and indicators that you want to keep monitoring." Finally, P4O4 concluded:

In the post-implementation phase, we selected which metrics and which activities

we want to monitor and started to receive daily reports on the performance of

each employees and each process. This was our optimization process, were we

tweaked many processes and did some changes in employees to receive optimal

results.

My analysis of company documents concluded that the participants where monitoring company performance using the cloud-based ERP system after the implementation phase. Reports from two organizations, D3O1 and D2O3, contained tables showing performance improvements after ERP implementation. In D3O1, a table depicted the increased number of prospects after two months of the ERP implementation. Also, another table in D3O1 showed the total amount of sales and the conversion rate increased after two months of ERP implementation. Document D2O3 contained a table showing the number of delay for each employee task in each of the company processes. The table should a decrease in the average delay time for each task after one month of ERP implementation. The project plan of another organization, D1O4, contained assigned activities after the implementation phase. The plan enclosed scheduled activities to select metrics to monitor after the implementation and develop daily reports for managers to receive. Also, the plan included scheduled activities to optimize the company processes based on collected information from the ERP reports.

The participants confirmed findings from previous literature. After implementing an ERP solution, company leaders should ensure that a company's operational resources are aligned with the strategic plan (J. Wang & Rusu, 2018). Hence, company leaders should monitor the performance of a company's processes and discover implementation gaps (McAdam et al., 2017). Rao and Kumar (2017) discussed that the implementation of an ERP system should standardize processes within an organization and measure processes performance. Company leaders benefit from a successful ERP implementation by monitoring performance of each process to reduce operational costs and improving

sales (Acar, Zaim, et al., 2017). Khan, Asim, and Manzoor (2020) discussed that ERP implementation can enhance the company business practices and can minimize the delay in supply chain management operations. Finally, company leaders can benefit from a successful implementation of ERP system in the processes of decision-making, planning, and creating a competitive advantage (Mann et al., 2017).

Researchers discussed that ERP software is a type of innovation that is implemented in an organization's core business processes to leverage performance (Acar, Tarim, et al., 2017; Govindaraju et al., 2018; Khan et al., 2020). Relating to the conceptual framework on the diffusion of innovation, this theme is consistent with Rogers' (2003) DOI theory to predict how an innovation will improve performance at the organizational level. All participants indicated improvement of processes after the implementation of a cloud-based ERP solution. Rogers (2003) discussed the innovation's complexity attribute that might hinder the adoption of an innovation. All participants explained that performance monitoring after implementing a cloud-based ERP should decreased delays in employees' tasks delivery. Zong, Wu, and Feng (2019) discussed that quality issues such as data accuracy, reliability, and system delays might negatively impact the adoption of innovation. All participants noted that post-implementation performance measuring helped company leaders to adjust and optimize company processes to reduce waste and reduce operational delays. Moreover, post-implementation performance monitoring relates to Six Sigma. Six Sigma application should enhance customer satisfaction by delivering consistent and reliable products or services with near zero defects (Pereira, Bento, Ferreira, Sá, & Silva, 2019). All participants discussed that

using post-implementation performance monitoring strategy improved the quality of

processes and reduced wastes in the operational processes. Two participants specifically

explained that post-implementation performance monitoring strategy helped improve

customer satisfaction and reduce customer attrition.

Applications to Professional Practice

The findings of the research may provide a valued source for SME owners to

improve company performance and growth by applying a successful strategy when

implementing a cloud-based ERP solution. The findings of this study present the insights

shared by four SME owners who used effective strategies to successfully implement a

cloud-based ERP solution. The emerged themes reflect professional practices for SME

owners to implement successful strategies when deploying and integrating a cloud-based

ERP solution. The four SME owners were able to improve their company performance

and growth with a cloud-based ERP solution through top management support,

requirements identification, software selection, user involvement, project management,

change management, and post-implementation performance monitoring.

The emerging knowledge from the findings may contribute to effective

professional practices by providing rich descriptions of management strategies that SME

owners need to understand during a cloud-based ERP implementation. Also, the findings

from this study could enable SME owners to develop cloud technology adoption and

understand ERP implementation challenges. The findings could contribute to professional

business practice by providing practical implementation strategies for SME owners who

intend to adopt and implement a cloud-based ERP system to improve business

performance and growth. Employing the DOI could enable SME owners to increase the

adoption rate of a new system and address the challenging attributes of innovation. Also,

relating the research to Six Sigma could support SME owners to understand how to

improve processes quality and customer satisfaction when implementing a cloud-based

ERP solution.

<div align="center">**Implications for Social Change**</div>

SMEs have a positive impact on socio-economic development, finding job

opportunities, and economic growth (Jamali et al., 2017). The findings of this research

can help SME owners to improve company performance and growth. As SMEs grow, an

increase in employment and incomes in the local communities may contribute to an

increase in purchasing power, which may positively improve the living standards in

societies (Maksimov et al., 2017). Also, the findings of this research can help SME

owners cope with social and economic disruptions like the COVID-19 pandemic. The

COVID-19 pandemic spread to all countries impacting communities and forcing

company employees to work from home (Anderson, Heesterbeek, Klinkenberg, &

Hollingsworth, 2020). During the COVID-19 pandemic, companies' performance and

sustainability are related to the degree of digitalization and the use of cloud technologies

(Makridis & Hartley, 2020). Company leaders adopting cloud-based ERP solutions can

ensure business continuity where employees can work remotely by accessing the ERP

system from anywhere.

Moreover, cloud computing can reduce the technological impact on the

environment through resource virtualization and improving energy efficiency (Di Salvo

et al., 2017). Carbon emissions may be reduced if SME owners utilize a cloud solutions

versus an on-premise data center (Gu, Fan, Wu, Huang, & Jia, 2018). Cloud computing

allowed for the deployment of different IT services on shared resources enabling optimal

usage of IT resources (Xu & Buyya, 2020). Ensuring SMEs sustainability by

implementing successful strategies to grow and improve performance, this research could

contribute to the prosperity of the local economy and reduce technological impact on the

environment.

Recommendations for Action

SME owners are called to consider the outcome of the study findings for

successful cloud-based ERP projects implementation to improve their company

performance and growth. Using the results of this study, SME owners should reflect on

the successful strategies on implementing cloud-based ERP systems to improve processes

quality and overall performance. With a successful cloud-based ERP implementation,

SME leaders could integrate the ERP system with their websites, mobile applications,

and reporting tools. The cloud platform enables SME leaders to improve communication

with customers, scale, and grow rapidly. Also, SME owners are called to note the current

findings as guidelines to assess their readiness to use cloud-based ERP solutions and

consider what the study participants explained as critical success factors for cloud-based

ERP implementations.

The findings of the study revealed seven successful strategies that SME owners

can use as guidelines when implementing a cloud-based ERP system. The successful

strategies are as follows:

- Top management support for IT implementation

- Requirements identification

- Software selection

- User involvement

- Project management

- Change management

- Post-implementation performance monitoring

S. Gupta et al. (2017) discussed that potential challenges for implementing a cloud-based ERP solution are (a) customizations, (b) organizational issues, (c) costs, (d) data security, and (e) strategic risks. SME owners applying top management support strategy (Shao et al., 2017), change management strategy (Alsharari et al., 2020), and user involvement strategy (Khan et al., 2017) can lower the risks of organizational issues and strategic risks. Also, applying requirements identification strategy (Ibrahim et al., 2019) and software selection strategy (Ogunrinde et al., 2017) can lower the risks of the need of customizations, costs, and data security. SME owners should not simply presume the implementation of ERP to improve their processes without post-implementation performance monitoring and continuous improvement activities.

In addition to SME owners and researchers, results from this study may be valuable to cloud ERP vendors and ERP project managers and consultants. Cloud ERP vendors may use the findings of this study to learn about the challenges facing SME owners in implementing ERP solutions and what strategies SME owners use to select an ERP vendor. ERP project managers and consultants may use the findings to understand

implementation requirements and critical success factors for implementation. I will share this study with SMEs through social media networks like LinkedIn. I will also seek support to distribute the results of the study through academic journals, professional conferences, and business magazines to communicate the potential benefits from this study.

Recommendations for Further Research

The results from this study warrant further exploration of strategies used by SME owners when implementing a cloud-based ERP solution to improve performance and growth. The following are my recommendations for further research. First, the findings of this study reflected the exploration of SME owners' strategies to implement cloud-based ERP solutions from a business view and not technology. I recommend expanding on the exploration of technology aspects of cloud-based ERP solutions. Second, I based this study in Lebanon and I recommend expanding the study to SME owners in other geographic locations. Third, I suggest carrying the study with a larger sample size and add to the diversity of it, such as making it more years of experience, number of employees, or educational background diverse to enhance generalization. Also, I propose performing the study to include more industries and business sectors. Finally, I recommend assessing the strategies used to implement cloud-based ERP solutions against a company's leadership style and organizational structure because leadership and organizational structure differ within each company and SME owners might need to consider specific aspects during a cloud-based ERP implementation.

Reflections

During the study, I did not initially anticipate that participants would be as supportive and cooperative as they were, however, during the interviews I valued their rich explanation and contributions to the study. Due to the high failure rates of ERP implementation, I understood that it would be difficult to find SME owners who had successfully implemented a cloud-based ERP solution to share their experiences and strategies. However, the four participants were accommodating and helpful in answering openly the interview questions. During the interviews, I followed the interview protocol and focused on not directing or influencing the responses of participants. I also gained knowledge from participants relating to innovation adoption, most effective strategy, user resistance, and other concerns when implementing a cloud-based ERP solution. I did not also expect that user involvement strategy is a critical success factor to reduce user resistance and increase innovation adoption rate. Also, I appreciated the applications to professional practice of the study, given the challenges SME owners and employees faced to manually execute business processes without using an integrated system. The findings of the study reflected growth factors relevant to SMEs and what roles SME owners can play to ensure increased sustainability of small businesses.

Conclusion

The purpose of this qualitative multiple case study was to explore the strategies SME owners use to implement cloud-based ERP solutions to improve performance and growth. The target sample included four SME owners from different industries in Lebanon who have successfully implemented cloud-based ERP solutions. From the

thematic analysis of the four interview transcripts and company documents, I developed

seven themes or strategies. All four SME owners found success in acknowledging top

management support for IT as a critical success factor. Additionally, all four participants

described the need to identify requirements for an ERP system in their companies before

selecting or implementing the software. All participants described user involvement as a

successful strategy to resist user resistance and increase adoption rate. Also, the

participants established project management and change management practices to

successfully deploy and integrate cloud-based ERP solutions. Finally, the participants

endorsed the practice of post-implementation performance monitoring to understand

processes' metrics and improve quality of processes to ensure growth.

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Appendix A: Interview Protocol

Preparing for the Interview. To prepare for the interview, I will search LinkedIn for

SMEs in Lebanon. I will message SME owners using LinkedIn messaging system to

explain this research study and validate that they implemented cloud-based ERP solutions

to improve their companys' performance.

Before the Interview. When I finish selecting the participants and the participants agree

to participate in this study free of charge without any compensation, I will following the

following process:

- I will call each participant to explain the purpose of the study, get agreement to

  record the interview, and schedule a time to meet for the interview at the

  participant's place of business.

- I will explain the consent form, send the consent form by e-mail, and inform each

  participant that they will be signing the consent form before starting the interview.

- I will ask each participant to prepare supporting documents related to the study

  and share a copy during the interview such as project plans, ERP implementation

  strategy, software specification documents, and post-implementation evaluation

  documents.

- I will send each participant by e-mail a copy of the interview questions and the

  interview protocol.

Starting the interview. Upon arrival at the participant's premises, I will spend the first

few minutes socializing to create a warm and friendly atmosphere. I will inquire to see if

the participant has read the consent and agreed to participate in the study with the

assurance of complete confidentiality. I will ask the participant to sign the consent form and I will allow the participant to have a copy. Once the participant is ready to proceed with the study, I will let the participant know that I will be recording the interview for transcription purposes and that at any time the participant does not want to continue, they can stop the interview without any consequences or repercussions and withdraw from the study.

Conducting the interview. I will start the interview process as follows: *My name is Ali Hamdar and I am a Doctoral student at Walden University. Thank you for participating in this study. The consent form reiterates that this interview is confidential, and you have agreed to participate, discuss your experiences, and share your opinion, and that I have your permission to audio-record our conversation and transcribe the recording. If at any point you feel uncomfortable or you would like to withdraw from the study, let me know and we will stop. I will be conducting a multiple case study interview for approximately 1 hour asking semistructured interview questions and asking follow-up probing questions.*

Follow up with probing questions. After asking the participant the semistructured open-ended interview questions, I will allow the participant to continue the conversation without interruption or leading comments. I will then follow-up with probing questions to the participant's responses for additional information and clarity.

Coding. I will explain that to ensure the participant's confidentiality, I will use a coding procedure that will not show the name of the business nor the participant's name in the study. The coding process is as follows: P1O1, P2O2, P3O3, etc.

Ending the interview. I will inform the participant that I will contact them at a later date to request a follow-up meeting to review and validate the interpretations of the interview responses. I will end the interview as follows: *Thank you (Mr. or Ms. Participant's name) for your time and participation in this study. I will contact you soon to seek your validation of the accuracy of my transcription of the interview and to ask clarifying questions. I look forward to our follow-up discussion. Thank you.*

Member Checking Interview. I will schedule a member checking interview with each participant by phone and then send an e-mail to each participant containing the interpretations of the interview responses. During the member checking interview, I will review each question's response and the interpretation. I will ask any questions on information that I might need during the analysis phase. Also, I will ask each participant if I missed anything and if they can provide me with any feedback or additional information anytime during the interview.

Appendix B: Certificate

Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that **Ali Hamdar** successfully completed the NIH Web-based training course "Protecting Human Research Participants."

Date of Completion: 09/24/2018

Certification Number: 2951456

NIH National Institutes of Health
Office of Extramural Research

Appendix C: Interview Questions

1. What strategies have you used to successfully implement an ERP system in your company?

2. What were the key challenges that you faced during the implementation phases?

3. How did you address the key challenges faced when implementing your strategies?

4. What were the principal types of training you and others received before or during ERP implementation?

5. What, if any, were the critical success factors that you used to ensure successful implementation of the cloud-based ERP solution?

6. How, if at all, did your company align its business plans with cloud-based ERP implementation?

7. Based upon your organization's experience, how did implementing cloud-based ERP solutions improve business performance and growth?

8. What else can you add to explain what strategies Lebanese SME owners use to implement cloud-based ERP solutions to improve business performance and growth?