

# Walden University

College of Management and Technology

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2020

Abstract

Small-to-Medium-Size Enterprise Managers' Experiences With Cloud Computing

by

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MS, University of Maryland University College, 2000

BS, University of the District of Columbia, 1994

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Management

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## Abstract

Historically, managers of small- and medium-sized enterprises (SMEs) have had concerns regarding cloud computing and cybersecurity. Their resistance to using cloud computing has influenced their ability to do business effectively and to compete with businesses that use cloud computing. The purposes of this descriptive phenomenological study were to explore the lived experiences and perceptions of SME managers that might influence their decisions to adopt cloud computing. Watson's concept of resistance to change and Davis, Bagozzi, and Warhaw's technology acceptance model were the conceptual frameworks that guided this qualitative study. Data collection consisted of conducting 16 semi-structured interviews with open-ended questions with SME managers. Data were coded and compared to identify emerging themes among responses. The findings showed positive cloud-based experiences, such as availability of training, flexibility, efficiency, cost-effectiveness, ease of use, and assurance data security. The findings indicated some negative experiences with cloud-based applications, such as fear of cybercrime, expensive licenses, software complexity, and concern for data security. The results of the study may lead to positive social change by providing a better understanding of the perceptions and experiences that influence SME managers' decisions regarding the adoption of cloud-based computing technology. Such understanding could be used to provide resources to allay the fears of SMEs and encourage them to be more willing to consider cloud computing.



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## Dedication

To my wife, Victoria, you have been my solid pillar in supporting me through this doctoral process. I could not have done it without your prayers and encouragement.

To my children, I dedicate this study to my daughter, Sifon Effiong, and my two sons, Uduakobong Effiong and Anthony Effiong Jr., in whom I wish to instill the value of higher education. May you all continue with the love of learning.

To my parents, this dissertation is dedicated in loving memory of my father, the late Alfred E. Effiong, who inspired me to be the best I could be. To my mother, Magdalene Effiong, I cannot thank you enough for your love and support.

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## Chapter 1: Introduction to the Study

Cloud-computing services can provide myriad advantages for small- and medium-sized enterprises (SMEs). From a broader perspective, cloud computing can improve organizational, technological, financial, and environmental concerns for businesses both large and small (Abdollahzadegan, Hussin, Gohary, & Amini, 2013; Brender & Markov, 2013; Khalil, Khreishah, & Azeem, 2014; Stieninger & Nedbal, 2014a). The implementation of cloud computing can be complex. The managers of SMEs often hesitate to adopt cloud-computing strategies due to high levels of risk they perceive in such programs, particularly regarding privacy, information security, and disaster recovery (Brender & Markov, 2013; Pearson, 2013; Purohit & Singh, 2013). The objective of this qualitative descriptive phenomenological study is to investigate the lived experiences of SME managers regarding cloud-computing utility and its associated risks and the reasons they might consider using cloud computing. The study focused on SME managers who live and/or work in the North East portion of USA.

This chapter begins with an overview of the background of this study. This section includes information about cloud computing and its advantages for SMEs and its complexities, disadvantages, and challenges. The problem statement includes information about the focus of the study, the purpose of the study, and the research question. I expand on the descriptive phenomenological study approach in a discussion about the nature of the study. Key definitions are provided to offer a clearer understanding of the terms. This

chapter includes discussions about the assumptions, scope, delimitations, and significance of the study, and it closes with a summary.

### **Background of the Study**

This section provides a brief overview of the study background using existing literature to note any gaps in research this study may help to narrow and the reasons this study is needed. Many authors have provided background information about cloud computing and its potential benefits, complexities, and disadvantages or challenges for SMEs. The following subsections elaborate on those aspects.

#### **Benefits of Cloud Computing for SMEs**

Earlier scholarship has noted that cloud computing could help SMEs to address organizational, technological, and environmental concerns. Cloud computing provides SMEs with a way to better manage and store their information (Abdollahzadegan et al., 2013; Brender & Markov, 2013; Khalil et al., 2014; Stieninger & Nedbal, 2014a). This technology can also enable smaller companies to store vast amounts of data off-site when their internal storage lacks capacity (Schaeffer & Olson, 2014). Cloud computing provides SMEs with the means of becoming more environmentally friendly because a significant portion of the operations run in a virtual space rather than requiring a physical space (Schaeffer & Olson, 2014).

Further benefits to cloud computing include providing enterprises with the ability to configure and link their technological resources, save on costs, provide more flexibility in their services, improve customer service, improve data security and storage, improve



service delivery and management processes, access on-demand provisioning and pay-per-use business models, and shorten production time (Gupta, Seetharaman, & Raj, 2013; Khalil et al., 2014; Pearson, 2013; Shawish & Salama, 2014). All the benefits and changes to operational structure could allow SMEs to become significant players not only in their local markets but also in the global arena (Ross & Blumenstein, 2015). Little is currently known about SME managers' perceptions of such benefits or about their needs regarding the practical implementation of this technology. Thus, this current study could serve to narrow this gap in the literature.

### **Complexities of Cloud Computing**

Earlier literature has highlighted the complexity involved both regarding cloud computing as a whole and specifically about SME adoption. In the forefront of this research is the idea that various cloud-computing service providers present their own positive and negative perspectives to potential SME clients, leaving it to SME managers to navigate the complexity of each provider before deciding (Ferry, Song, Rossini, Chauvel, & Solberg, 2015; Subramanian, Abdulrahman, & Zhou, 2014; Yew & Goh, 2016). This situation is comparable to a consumer purchasing an Internet package. A consumer is provided with information about different providers available in their location, like Verizon and Spectrum, by accessing company websites or requesting information over the phone. Depending on a consumer's needs, they will consider the product offerings and select a provider. SMEs also need to adjust current operations to suit the implementation of cloud computing, which can be a time-consuming and

complex process, especially if SME managers choose to use multiple cloud platforms and/or services (Ferry et al., 2015).

SME managers are often responsible for coordinating the implementation and management of cloud computing. They are also responsible for ensuring proper security by choosing the correct encryption offerings from those available (Borgman, Bahli, Heier, & Schewski, 2013; Palmié et al., 2015). To do so, managers need to have a better understanding of cloud-computing operational structures and maintenance. This requires SME managers to thoroughly understand how cloud-computing technology works, along with its support systems and services (Wu, Cegielski, Hazen, & Hall, 2013). SME managers are responsible for selecting the appropriate cloud products for their enterprises. Nonetheless, little research is available on how managers navigate these complexities and responsibilities effectively, which is a gap I intended to address with this study.

### **Disadvantages and Challenges of Cloud Computing in SMEs**

Existing literature indicates that companies not equipped for cloud computing are more likely to face challenges and resulting disadvantages. These difficulties may stem from a lack of knowledge on the part of managers, a lack of resources and/or infrastructure, and a lack of awareness about cloud-computing services (Avram, 2014; Carcary, Doherty, & Conway, 2014; Huang, Li, Yin, & Zhao, 2013; Park & Kim, 2014). This lack of insight could lead to incorrect implementation or adoption of the technology (Avram, 2014; Carcary et al., 2014; Huang et al., 2013; Marinescu, 2013; Oliveira et al.,

2014; Park & Kim, 2014; Shawish & Salama, 2014; Subramanian et al., 2014). The literature also revealed that many SME managers are hesitant to adopt cloud computing due to security and privacy concerns, an area this study was designed to consider (Ahmed & Hossain, 2014; Brender & Markov, 2013; Pearson, 2013; Purohit & Singh, 2013). Problems in cloud-computing adoption may occur if organizations do not properly research their readiness (Carcary et al., 2014; Gangwar, Date, & Ramaswamy, 2015). Issues may also arise from organizations inadequately preparing infrastructure and employees to accept the new technology (Carcary et al., 2014; Gangwar et al., 2015). Researchers have not adequately inquired about how these issues relate to SMEs in the business sector, a gap this study may contribute to filling.

The managers' attitudes toward new technology and/or cloud computing may affect whether SMEs adopt such technologies. Other factors affecting SMEs' adoption of cloud computing have included organizational and societal cultures and managers' past experiences and present abilities regarding new technology (Alshamaila, Papagiannidis, & Li, 2013; Trigueos-Preciado, Pérez-González, & Solana-González, 2013). Researchers have noted that if SMEs fail to implement cloud computing, they have been likely to fall behind their competitors and fail to remain resilient, productive, and relevant in their industry (Conz, Denicolai, & Zuccella, 2017; Sultan, 2013; Yang, Sun, Zhang, & Wang, 2015). Little research exists about SMEs and their managers' perceptions and acceptance of cloud computing, which suggests the need for this study.

Most of the existing literature provided reasons why SMEs adopted or failed to adopt cloud computing, none of the resources addressed manager perceptions in the North East area of USA, nor did they provide adequate solutions for counteracting the lack of SME managers' awareness regarding cloud computing. Few researchers noted how managers' attitudes and experiences could impact employee acceptance and organizational policies surrounding cloud-computing adoption (Lin et al., 2014). To this end, it became clear this current study could fill a gap in the broader literature around cloud computing.

### **Problem Statement**

SME managers attribute the risks and dangers of cloud-computing technologies to privacy, loss of control, and information security issues. These hazards could harm the operations of the enterprise, causing these SMEs to lag behind competitors in client services, administration, communication, and security implementations (Ahmed & Hossain, 2014; Khalil et al., 2014; Ross & Blumenstein, 2015). According to Kumar and Samalia (2016), only 35% of SMEs worldwide consider cloud computing. This demonstrates a severe lag between SMEs and larger enterprises, where the adoption rate is approximately 74% (Columbus, 2015).

The general problem that guided this study was that there is little understanding of how SME managers perceive issues related to cloud computing. The specific problem was that managers working in the North East area of USA have not shared how they perceive and experience cloud computing and the mitigating decisions they make related

to cloud computing. There is a gap in the literature about cloud computing in this context, as few researchers have explored the perceptions of cloud computing from the managers' perspectives. The majority of literature dedicated to cloud computing consists of quantitative or qualitative case studies of cloud-computing adoption and barriers in general (Doherty, Carcary, & Conway, 2015; Kumar & Samalia, 2016).

### **Purpose of the Study**

The purpose of this descriptive phenomenological study was to explore the lived experiences and perceptions of SME managers, which might influence their decisions to adopt cloud computing. By gaining a better understanding about the perceptions that influence SME managers' decisions to adopt cloud-computing technology, this study may be used toward the development of strategies to address mitigating issues like privacy and security concerns. A better understanding of how to address cloud-computing concerns might help more SME managers to accept cloud computing and adopt this technology in the North East area of USA.

### **Research Question**

This research is guided by a single overarching question:

RQ: What are the lived experiences and perceptions of SME managers about cloud computing regarding their decisions that might influence adoption?

### **Conceptual Framework**

The primary conceptual framework that guides this study is Watson's (1973) concept of resistance to change. Supporting information will include Davis, Bagozzi, and

Warshaw's (1989) technology acceptance model. Watson's (1973) resistance to change theory purports that any change occurring on an organizational, social, or individual level will naturally receive resistance. This notion is due to people having adapted to previous changes and not wishing to change their behaviors and procedures to adapt to another. This theory is connected to Davis et al.'s (1989) technology acceptance model (TAM), which considers whether a person's perceptions of technology, their perceived ease of use of the technology, and their perceived usefulness of the tool can predict their usage. These frameworks will be beneficial in studying SME cloud-computing acceptance, as it could allow for insight into current reasons for resistance to this change and making informed decisions about cloud computing. I further explain the frameworks in the following section.

### **Resistance to Change Theory**

People prefer the status quo and do not welcome change. According to the resistance to change theory (Watson, 1973), resistance is expressive in five stages: (a) heavy resistance to change; (b) evaluation of the proposed change and the positives and negatives associated; (c) increased usage by resistant parties, leading to a tipping point toward the change; (d) change persistence; and (e) enforcement of change, making it the new norm (Watson, 1973). Watson (1973) highlighted how various factors might hinder change, including people's complacency or their state of being used to the current norm, which is also related to habit and persistence. Other factors include knowledge frameworks and dependence on current models (Watson, 1973). For this study, SME

managers would need to gain new knowledge and learn about new methods offered through cloud computing to help employees better accept this change. Other hesitations to change may include feelings of insecurity about the change or having a vested interest in maintaining the status quo (Watson, 1973).

Coch and French (1948) provided preliminary data that would come to support Watson's (1973) theory. These researchers studied how resistance to change could reduce efficiency and productivity (Coch & French, 1948). This reduction called for new and improved means of addressing resistance to improve company shares, production, and profit (Coch & French, 1948). As part of the process, they noted that it was crucial to understand why people resist change in the first place. The current study was used to determine how SME managers think about the source of the resistance to incorporate cloud-computing technologies in their businesses.

To provide an alternative perspective, Ford, Ford, and D'Amelio (2008) stated that resistance is not always negative. Ford et al. (2008) supported that change agents could use resistance as a tool because this resistance might be valid, and change agents should not dismiss resisting parties as being irrational (Ford et al., 2008). These people may have valuable information as to their unacceptance. The opposition experienced from people could be the result of the sense-making process, which will lead to change agents' greater ability to promote and understand why a change might be beneficial. Instead of fighting to overcome change resistance, those implementing change could embrace the resistance as part of an ongoing conversation to promote general

advancement (Ford et al., 2008). This conceptual lens provides greater insight into why SME managers are often resistant to incorporating this new technology. Giving those in opposition a voice proves the validity of their argument while highlighting the importance of moving toward cloud-computing solutions. The participant responses can also be compared to the factors and potential means of negating resistance presented in this framework, adding validity to both the study and the framework itself (Denscombe, 2014; DePloy & Gitlin, 2016).

### **Technology Acceptance Model**

TAM considers the reasons that people may or may not accept new technologies. This can be used to further explain a person's justification in refusing to use a computer or related technologies, which includes the ability to foresee a person's computer behaviors by assessing their intentions (Davis et al., 1989). If a person uses a computer solely to play solitaire, for instance, this person might be unfamiliar with cloud computing and unlikely to use it. If technology is not being used consistently or properly, it cannot contribute to business productivity (Davis et al., 1989).

The term *TAM* is used interchangeably with the term *user acceptance theory*. TAM was first coined by Davis in 1986 to foresee and understand technology use and integration (Alomary & Woollard, 2015). In other words, TAM was created as a way to investigate peoples' technology-related behaviors to identify trends across larger populations (Lai, 2017). Years later, TAM was used to understand the characteristics that encourage a person's acceptance or denial of technology by associating technology with



business (Alomary & Woollard, 2015). The theory emerged through research devoted to technology use, as it became more prevalent in the 1970s (Chutter, 2009). In this model, users pay attention to “perceived usefulness” and “perceived ease of use” (Alomary & Woollard, 2015, p. 1). In other words, TAM posits that users choose to adopt technology into their workplace behaviors if technology eases their task performance and appears easy to use. Perceived usefulness refers to whether users perceive technology as being useful to their daily tasks; perceived ease of use refers to whether the user believes the technology is easy to use (Lai, 2017). Ultimately, TAM refers to the notion that a user’s behavioral intention is a predictor of the user’s acceptance of the technology in question (Alharbi & Drew, 2014).

### **Integrating Both Theories in This Study**

Approaching decisions from a place of logic and rationality rather than emotion or fear of the unknown could lower risks, resistance, and complications. Emotions like fear can cloud judgment and prevent decision-makers from choosing at all or from making the best decision in the current context (Watson, 1973). A user’s intentions and attitudes may serve as predictors of technology use (Chutter, 2009). This perspective aligns with the concept of resistance to change that underpins this study. Understanding the logic behind SME managers’ decisions about cloud-computing adoption could help to identify where and how their decision-making processes may need adjustment to make them more open to choosing cloud computing.

These conceptual frameworks may be beneficial in studying SME cloud-computing acceptance, providing insight into reasons for resistance to this change, and supporting informed decisions about employing cloud computing. Combining this framework with the descriptive phenomenological study approach may lead to specific and practical examples of decision-making on cloud computing regarding making rational decisions and resistance to this technology in the business SME context. Such insights could lead to changes in SME policies regarding cloud-computing adoption, making SMEs more competitive (Abdollahzadegan et al., 2013; Carcary et al., 2014; Ross & Blumenstein, 2015).

### **Nature of the Study**

This descriptive phenomenological study was designed to explore the lived experiences and perceptions of SME managers regarding cloud-computing utility and the associated risks. To do so, I rejected quantitative and mixed-methods designs because the intent of this research was not to quantify data related to cloud-computing use. I focused instead on managers' perceptions and lived experiences related to cloud computing and their decisions regarding the adoption of this technology (Bryman, 2016; Lewis, 2015). Views, experiences, and decision reasoning cannot be quantified, but should instead be explained, hence the need for a qualitative approach (Bryman, 2016; Lewis, 2015). Because quantitative data is not useful to this study, a mixed-methods design would have been superfluous. I determined the needed insight and explanations for this study could best be achieved through a qualitative approach (DePloy & Gitlin, 2016). The

information I was looking to collect from this study was purely descriptive and based heavily on the personal experiences of the participants.

I also selected the use of a descriptive phenomenological design for this study. The information collected in this study was anticipated to include reasons that SME managers may or may not consider using cloud-computing services, factors SME managers believe are necessary for implementing this technology, the SME managers' lived experiences using the technology, and the skills and resources SME managers see as necessary for implementation. I chose a descriptive, phenomenological approach for this research because it would facilitate efforts to provide deeper insight into SME managers' decisions regarding cloud computing (DePloy & Gitlin, 2016; Lewis, 2015). Phenomenological studies are concerned with lived experiences, and this research involved data gathered through in-depth interviews to merit information about SME managers' decisions to adopt or not to adopt cloud computing (DePloy & Gitlin, 2016; Young, 2015). This study's results may address the dearth of phenomenological studies about cloud computing (Brender & Markov, 2013; Mohlameane & Ruxwana, 2014).

Other qualitative approaches were deemed less appropriate for this study. For example, case study, grounded theory, and ethnography were rejected as potential research designs (DePloy & Gitlin, 2016; Lewis, 2015; Yin, 2013). This research was based on SME managers' lived experiences instead of the application and results of the phenomena in a specific context, thereby excluding the case study approach (Yin, 2013). Grounded theory and ethnography were also discarded as approaches for this study

because this study was not focused on the development of new theories or the exploration of cultural issues (DePloy & Gitlin, 2016; Lewis, 2015).

To collect data for this study, I interviewed managers of SMEs located in the North East area of USA. According to the Small Business Administration, Maryland was home to 581,712 small businesses in 2018 which employed some 1.1 million workers. Businesses considered eligible for inclusion in this study had fewer than 100 employees; I included small businesses, with 19 employees or less, and medium-sized businesses, with 20 to 99 employees. The sample for this study included 12 male and four female SME managers who work in this region. I arranged to conduct face-to-face interviews with individuals that qualified for this study. I first collected demographic information about the participants, followed by their general perception of cloud-computing technologies and their lived experiences using cloud computing in business. The interview questions were created using an open-ended structure, which encourages participants to provide more thorough responses. The collection process continued until data saturation was reached, which is when no new information appears. I transcribed the participants' responses, and the participants checked the transcription for accuracy and to reduce the potential for bias. Once the transcriptions were approved, I uploaded the participants' responses into NVivo, a software program. The NVivo 12 program was used to process the participants' responses and unveil trends based on diction, sentence similarity, and context. The qualitative information gathered was used to unveil themes as to how the managers of SMEs in the North East area of USA perceive cloud computing

for their businesses. Due to the amount of description required for this study, a qualitative descriptive phenomenological design was the most suitable choice.

### **Definitions**

For clarification purposes, it may be advantageous to provide clear definitions of the following terms and phrases:

*Cloud-computing technology*: Designed to allow on-demand network access to a shared pool of configurable computer services, like networks, servers, and applications, that can be easily accessed with little oversight (Carcary et al., 2014).

*Cloud storage*: Virtual space where users can save data instead of using external hardware (Xue, Ni, Li & Shen, 2017).

*Computer network*: A system of two or more digital devices connected via a network (McMahon, 2003).

*Encryption*: A process using algorithms to alter, or obscure information being transferred between computers to prevent access from unauthorized users (Edwards, 2016).

*Network plan*: A product that indicates all the technologies in the network and the connections between these technologies (McMahon, 2003).

*Security*: Measures used to protect information being saved virtually, including password protection or authenticating user information by receiving a text or e-mail with a code (Cerf, 2017).

*Server*: A computer program that serves to process, transmit, and receive requests from other computing devices recognized as clients (McMahon, 2003).

*Small- to medium-sized enterprise (SME)*: The definition of an SME varies from country to country (Organisation for Economic Co-operation and Development [OECD], 2005). In the United States, SMEs are companies with fewer than 500 employees; small companies are those that employ fewer than 50 workers (OECD, 2005). In the context of this study, however, a small business is distinguished as having 19 employees or fewer, while a medium business has 20 to 99 employees.

*Storage*: Hardware, like external hard drives, used to store information previously saved on another device (Luttgau et al., 2018).

### **Assumptions**

There were several assumptions for this study. First, I assumed the study participants were SME managers in the North East area of USA. I assumed each participant provided honest responses to the interview questions. I assumed that participants would express their questions or concerns if they experienced any confusion during the study. I also assumed throughout this study that cloud computing is beneficial for SMEs in the retail industry.

### **Scope, Limitations, and Delimitations**

Through this qualitative descriptive phenomenological study, I explored the lived experiences and perceptions of SME managers that might influence their decisions to adopt cloud computing into their businesses. The population consisted of 12 male and

four female SME managers in Maryland. Although the findings may translate into greater insight, they only reflect the perceptions of SME managers in this region. According to Leung (2015), most qualitative studies are created to study a specific event or occurrence in an even more specific context. As a result, qualitative studies are not particularly known for being generalizable, which remains the case for the present study. Although some of the information elicited from this study may be relevant to other individuals or groups, the findings will unlikely be identical due to different variables (Leung, 2015). For this reason, the results of the study are not generalizable, but they are transferable. The assumption cannot be made that the perceptions of SMEs in this region indefinitely pertain to all SMEs nationwide, but it may be possible that they apply to some, or even all, of them. I gathered data through in-depth interviews, with the understanding that the interview process may require a substantial amount of time to gather adequate data and to allow for follow-up questions if necessary.

Several limitations exist in this study. Limitations are facets outside of the researcher's control (Rahman, 2016). The information in this study heavily relied on the data presented by the participants. I was unable to control whether participants told the truth or whether their opinions were biased, fabricated, or embellished. This study was not reliant on including information from all demographics, so there was a possibility that the participants would be all the same race. This was also the case for gender, and the participants could have been all women or all men. Participation was limited to people who agreed to be part of the study

Several delimitations existed in this study. Delimitations are facets within the control of a researcher (Rahman, 2016). This included that the participants all live and/or work in Maryland. This study was delimited to the small- and medium-sized companies I chose to participate. The manager of one business may approve of participating in the study, while another manager may not wish to participate. Another delimitation was the period during which the study was conducted. Events occurring during this time could have influenced results. Also delimited were the research question, purpose, design, and interview questions.

### **Significance of the Study**

For this study to be relevant, it must add value to the existing literature and offer value to society in general. This study may be significant theoretically, practically, and socially. Each of these areas is discussed in further detail in the following subsections.

#### **Significance to Theory**

This study may be significant in terms of broader theory by adding information to the existing literature about cloud computing and SME managers' perceptions of its complexity. The study could expand on the understanding of SME managers' perceptions about cloud computing, its complexity, and what influences SME managers' acceptance or rejection of this technology. The study focused specifically on SMEs from a specific area in Maryland that has not been widely studied.

Through this study, I sought to understand what SME managers believe is required in terms of skills, resources, and infrastructure to implement cloud computing



efficiently and to navigate its complexities. All these findings may add to the current literature and assist future researchers in understanding manager perceptions and needs regarding cloud computing (Aharony, 2015; Lin et al., 2014). The findings may also assist researchers in identifying areas of research that have not been addressed in this study or in general.

### **Significance to Practice**

This research may be significant in providing practical applications and means for SMEs to adopt cloud computing. By assessing managers' current perceptions, awareness, and potential fears regarding implementing cloud computing, findings may point to strategies for allaying such fears or identify the reasoning behind the acceptance or rejection of cloud computing (Shawish & Salama, 2014). This information could provide SME managers with better insight into cloud computing, its benefits, and the needs associated with its implementation (Avram, 2014; Park & Kim, 2014; Shawish & Salama, 2014). By providing a better understanding of how managers perceive cloud-computing complexities, this study could merit valuable information for SMEs in navigating such complexities, better addressing manager concerns, and providing managers with better infrastructure, resources, and skill development to ensure positive outcomes and cloud-computing implementation.

### **Significance to Social Change**

This study may provide a means for positive social change because it may provide a stronger understanding of a lesser understood phenomenon about cloud-computing

benefits for SME managers. The purpose of this descriptive phenomenological study was to explore the lived experiences and perceptions of SME managers that might influence their decisions to adopt cloud computing. By gaining a better understanding of the perceptions that influence SME managers' decisions to adopt cloud-computing technology, this study may be used toward the development of strategies to address mitigating issues like privacy and security concerns. A better understanding of addressing cloud-computing concerns might help more SME managers to accept cloud computing and adopt this technology in the study area.

### **Summary**

Cloud-computing services can offer an array of advantages for SMEs, while also challenging SME managers with potential complexities, disadvantages, and complications. Because little is known about the perceptions of SME managers regarding cloud-computing services, I used this qualitative descriptive phenomenological study to gather data regarding the perceptions of a specific group of SME managers. This includes information about cloud-computing technologies and the associated risks, as well as the reasons that participants may decide to use cloud computing. In Chapter 1, I provided an overview of the study background, including background information about cloud computing. Chapter 1 also included a discussion of the problem statement, the purpose of the study, the research question, the conceptual framework of the study, and key definitions. Chapter 1 included information about the assumptions, scope, delimitations,

and limitations of the study, as well as the significance. Chapter 2 will include a comprehensive literature review discussing all avenues of research related to the study.

## Chapter 2: Literature Review

The purpose of this descriptive, phenomenological study was to research the lived experiences and perceptions of SME managers that might influence their decisions to adopt cloud computing into their businesses. By gaining a better understanding of the concerns and perceptions that influence SME managers' decision to adopt cloud-computing technology, this study may be used to improve the development of strategies to address mitigating issues. A better understanding of and suggestions for addressing cloud-computing concerns might help SME managers become more accepting of cloud computing and more willing to adopt this technology.

Chapter 2 will begin with information about the theoretical frameworks that underpin this study. Next, I include an exhaustive investigation of earlier literature about the topic. This study was designed to narrow the gap in knowledge regarding SME managers' perceptions of cloud computing, its impact on SME policies and employee attitudes, and the different levels of cloud implementation available. Chapter 2 ends with a summary and conclusion.

### **Literature Search Strategy**

The literature review comprised of scholarship from Google Scholar, ERIC, Researchgate, EBSCOhost Online Research Database, ProQuest, and Emerald Insight. To locate relevant scholarship, I used the following key search terms: *adoption and diffusion theory, barriers to cloud computing, benefits of cloud computing, cloud computing, cloud technology, innovation, diffusion, cloud computing innovation, SME cloud computing*

*adoption, adoption theory, cloud computing awareness and acceptability, cloud computing complexity, and resistance to change.* I used these keywords individually or in combination to locate relevant studies in the databases. I identified 108 sources for inclusion, 85% of which were published between 2013 and 2018. Table 1 indicates the dates of the sources used. Simultaneous key term searches across all databases and websites were performed up to the point of data saturation, and although many articles were still available, they conveyed similar messages (Fusch & Ness, 2015). Seminal works comprised 10% of sources published before 2013, including material regarding the theoretical framework, the adoption of innovation and resistance theories, and earlier applications of cloud computing.

Table 1

*Dates of Sources Used in the Study*

# sources 2013 to present	# sources 2012 and earlier	Sources without dates
92	16	0

### **Conceptual Framework**

The chief conceptual framework that grounded this study is that people generally prefer the status quo and do not easily welcome change. The phenomenon of interest in this descriptive phenomenological study is set well within Watson's (1973) theory of resistance to change. This theory purported that any changes that occur on organizational, social, or individual levels will naturally meet resistance. The user acceptance theory or TAM suggests that a person's use of technology is influenced by their behaviors and

attitudes and perceived ease of use and perceived usefulness of the technology (Davis et al., 1989). These theories served as the main frameworks for this study.

Two additional frameworks also merit mention. This section provides information regarding the adoption and diffusion of innovation theory, which applies to the period between an innovation's awareness and planning phase and its eventual adoption and implementation (Roger, 1962; Wisdom, Chor, Hoagwood, & Horwitz, 2014). This section also includes the technology-organization-environment (TOE) framework applied by researchers to explore factors influencing companies' decisions about technological innovation (Tornatzky & Fleischer, 1990). The concepts discussed in the literature review are categorized and debated according to the most prominent factors retrieved during the search for literature about the research topic. Although most of the studies included more than one concept, the discussion follows a continuous thread highlighting the most suitable studies relevant to the perceptions of the complexity of cloud computing by SMEs.

### **Theory on Resistance to Change**

Kritsonis (2005) summarized several change theories to show that successful change can be encouraged and facilitated for long-term success. The theories Kritsonis (2005) discussed did not apply to the discussion of resistance to change in the adoption of cloud computing as they either do not consider personal factors that can affect change or they focused on cyclical changes that cannot be applied in the case of the adoption of cloud computing. Watson's (1973) resistance to change seemed to be the most suitable

theory for the discussion of resistance to change to innovation. Resistance often occurs due to a conflict between the desired stability of sameness and the need for advancement through change (Watson, 1973). If change is perceived as too sudden or invasive, resistance is stronger as a means of creating balance or reaffirming stability. Watson (1973) noted that as a method of counteracting resistance, change agents might attempt to remove stressors. That is, instead of forcing change, agents may try to prove how the change can make people's lives easier, offer necessary training, or adapt the environment to accommodate the change.

Watson's (1973) framework provides insight into resistance to the adoption of cloud-computing technology by SMEs and how that resistance could be addressed. Watson (1973) suggested that resistance to change occurs in five stages: (a) great resistance to change; (b) appraisal of proposed change; (c) increased mobilization of resistant parties, leading to a tipping point toward change; (d) change persistence; and (e) enforcement of change until it becomes the new norm. Watson (1973) highlighted how various factors might hinder change, pointing to individuals' complacency (the condition of being used to the current normal), which is also related to habit and persistence and people's change readiness (Rafferty, Jimmieson, & Armenakis, 2013).

Rafferty et al. (2013) explained that people's readiness for change might depend on their beliefs about whether the change is necessary and on their attitudes and intentions regarding their organizations' capacity for change. SME managers, then, would need to gain new insights and learn about new methods offered through cloud

computing to assist people with accepting this change into their companies. Hindrances to change can include feelings of insecurity about the change or having a vested interest in maintaining the status quo (Watson, 1973).

### **Technology Acceptance Model**

TAM, used interchangeably with user acceptance theory, provides a means to address why people accept or reject the use of computers and related technologies, thereby predicting the technology use of groups of users (Davis et al., 1989). TAM serves to identify patterns and unveil trends across user populations (Alomary & Woollard, 2015). TAM enables researchers to understand why people may gravitate to or reject technology, which may provide insight into how to counteract refusal.

One of the key components of user acceptance theory is the idea of perceived usefulness and perceived ease of use (Alomary & Woollard, 2015). *Perceived use* refers to people's perceptions of whether adopting technology will make their jobs easier (Lai, 2017). In the case of work-related tasks, *perceived usefulness* would refer to employees' perceptions of whether the technology will help their task performance. *Perceived ease of use* refers to the degree to which people think that using technology is easy or difficult (Lai, 2017). Perceived usefulness and perceived ease of use collectively influence a person's decision to accept the technology. The person's perceived usefulness and perceived ease of use contribute to the understanding of whether they will accept or reject a technology (Alharbi & Drew, 2014).



It is likely that perceptions about technology influence a person's technology use. According to Kastanakis and Voyer (2014), peoples' perceptions of other people, places, and things are largely influenced by the culture they are raised in. For instance, culture can influence understanding social cues; a thumbs-up indicates approval in American and European countries but is offensive in Asian and Islamic countries (Kastanakis & Voyer, 2014). This dynamic is understood as cultural conditioning, which translates into culturally understood and accepted definitions that govern or influence ideas, customs, traditions, products, and organizations (Kastanakis & Voyer, 2014). Brezavscek, Sparl, and Znidarsic (2016) explored student perceptions of statistical software devices. They found that students were more likely to want to use the statistical software when they were being educated in a setting that highly regarded the devices. The same could be inferred about SME managers' perceptions of cloud-computing technologies. According to TAM, a person who is familiar with and accustomed to using a certain technology may have different motivators for cloud computing than someone inexperienced with technology. This theory serves to communicate a deeper understanding of behaviors attributed to people's perceptions and attitudes that influence their views about technology use (Brezavscek et al., 2016).

### **Adoption and Diffusion of Innovation Theory**

Roger (1962) recognized the terms *technology* and *innovation* as synonymous. According to Roger (1962), *adoption* denotes a choice of full implementation and use of technology as the optimal course of action. Uncertainty is therefore regarded as a

significant obstacle to decision-making and adoption. Roger (1962) referred to *diffusion* as the progression of innovation; it is transferred through individual channels over a period among the individuals who make up a social system. In other words, Roger (1962) used diffusion to describe the process of people becoming familiar with technology, particularly in a workplace setting.

Roger (1962) categorized adopters along an innovation curve according to their readiness to adopt an innovation. The bottom left point of the curve denotes *innovators*, or those willing to experience new ideas. The next point on the curve indicates *early adopters*, or those more likely to hold innovative roles in the social system. These adopters typically act as experts for the diffusion of information. Next comes the *early majority* on the curve, or those who quickly consider the adoption of innovation. The *late majority*, or laggards, are the one-third of individuals or organizations that adopt new technology at a later stage and those who are more skeptical of innovation.

Al-Isma'ili, Li, He, and Shen (2016) applied Roger's (1962) adoption and diffusion of innovation framework to clarify the qualities that influence adoption in an organization. These qualities include relative advantage, or the degree to which cloud computing is adopted in comparison with previous versions of the technology and compatibility, or the extent to which organizations incorporate the new development into current business processes. Complexity, in this case, refers to the effort that cloud computing requires when compared to other technologies. Observability defines the level to which the new development is observable by others, the simplicity with which the

innovation can be tested, and its ability to satisfy the expectations of the population (Al-Isma'ili et al., 2016).

Al-Isma'ili et al. (2016) collected research data from 15 firms, 11 were SMEs and four were cloud service providers. Al-Isma'ili et al.'s (2016) findings supported the hypothesis proposed by Jahanmir and Lages (2016), which was that technological, organizational, and environmental factors could positively influence innovation. Two factors that seemed to have no significant effect on the adoption of cloud computing were complexity and competitive pressure (Al-Isma'ili et al., 2016). Likewise, Stieninger and Nedbal (2014b) applied Roger's (1962) diffusion and innovation theory in their studies on innovation adoption regarding cloud computing. Their findings indicated a positive relationship between innovation adoption and the implementation of cloud computing when compatibility, relative advantage, and complexity were used as independent variables. The application of the diffusion and innovation framework and its innovation essentials are repeated in several studies in the sections below.

### **Technology-Organization-Environment Framework**

Tornatzky and Fleischer (1990) created the TOE model to investigate the factors that may influence a firm to adopt a technology. The researchers based their hypothesis on the idea that the adoption and implementation of most inventions are informed by three elements: the technology context, the organizational context, and the environmental context. These three features represent the opportunities and barriers to the adoption of technology (Tornatzky & Fleischer, 1990).

Perspectives on technology embrace both internal and external technologies, which, in turn, include processes and equipment. The observed characteristics and resources in the organizational context include the firm's size, its managerial structure, human resources, and the relationships among employees. The structure and size of the industry, the competitors and regulatory situations make up the environmental context (Tornatzky & Fleischer, 1990). The TOE model has been used in combination with other models to research the implementation of complex and interactive systems and to define the multi-faceted environment of the adoption (Abdollahzadegan et al., 2013). Gangwar et al. (2015) integrated TAM, or user acceptance model, with the TOE framework to establish the determinants of cloud computing. TAM can also be applied to determine the influence of the design of the system on the person's or organization's acceptance of cloud computing (Abdollahzadegan et al., 2013; Stieninger, Nedbal, Wetzlinger, Wagner, & Erskine, 2014).

Alshamaila et al. (2013) applied the TOE framework as a theoretical foundation for a qualitative study on SME cloud implementation. The researchers assumed if SMEs had access to adaptive technologies, it would be easier for them to deliver goods and services. The results of the study could be used to help remove some of the most important barriers for SMEs. Alshamaila et al. (2013) used semi-structured interviews for data collection from 15 different SMEs and service providers in northeast England, selecting that region as one where SMEs make up most of the area's business presence. Alshamaila et al. (2013) identified core elements that played a part in SME employment

of cloud services, including: relative advantage; uncertainty; geo-restriction; compatibility; trialability, or the ability to test the system; the size of the organization; top management support; prior experience; innovativeness; industry and market scope; supplier efforts; and external support (Alshamaila et al., 2013).

### **The Use of All Theories in Contributing to This Study**

Looking at SME cloud computing through the lens of the resistance to change theory will yield insight into why SME managers resist incorporating this technology. Existing literature revealed the adoption and diffusion of Roger's (1962) innovation model and Tornatzky and Fleischer's (1990) TOE framework in combination with several other models to support research on new technologies and their adoption. Davis et al.'s (1989) TAM offers a framework for understanding the motivators behind a person's acceptance or rejection of technology.

The introduction of information technology (IT) in the early 1950s and the latest cloud-computing innovations have made it possible for organizations to rearrange and decentralize their work. The new developments have encouraged the sharing of work and communication with customers and suppliers that are far removed from one another (Abdelmaboud, Jawawi, Ghani, Elsafi & Kitchenham, 2015). These practical designs place substantial weight on the management and communication processes in business to maximize the benefits of the new virtual structures (Abdelmaboud et al., 2015). Business managers have gradually come to realize that high costs associated with IT service maintenance and the burden of managing these information technologies could be moved

to external cloud service providers (Jula, Sundararajan & Othman, 2014). Business leaders also realized they could meet their needs in a rapidly changing market and remain ahead with their consumers and suppliers (Jula et al., 2014).

### **Purpose of Phenomenological Descriptive Design**

A discussion was provided about the theoretical frameworks that underline the present study. Also of importance is the reasoning behind the decision to use a phenomenological, descriptive design in the present study. According to Giorgi (2009), this type of design requires researchers to only regard the information being provided by participants, and not to preconceive any information about the participants. In other words, all theoretical assumptions should be eliminated from the data collection (Giorgi, 2009). Phenomenology is a type of research that entails exploration into a person's experiences to unveil information that is unbeknownst to them (Matua & Van Der Wal, 2015).

Descriptive phenomenology, on the other hand, is a thorough description offered by participants about something that happened to them. In the present study, it is imperative for me to collect a substantial amount of information from participants to determine whether trends or similarities exist amongst their experiences (Matua & Van Der Wal, 2015). The data collected must be exclusively gathered from the participants, and the participants' descriptions of these accounts are vital to answering the research question. The role of the descriptive quality of the qualitative phenomenological design is that heavy description is used to understand occurrences better and/or situations that are

not thoroughly understood (Matua & Van Der Wal, 2015). In correspondence for this need for a greater description, I must collect demographic information about the participants, including their gender, ethnicity, economic status, vocation, and/or health (Matua & Van Der Wal, 2015). This ever-present emphasis on the participants' experiences is supported by the need for a heavy description, as outlined by the phenomenological, descriptive design.

### **Review of the Literature**

Cloud computing is a relatively new technology, but it was created using traditional concepts. Technology companies wished to provide consumers with more accessible storage solutions that were both sufficient and convenient (Alzahrani, 2016). Cloud computing was officially integrated into the technology world in 2006 when Amazon introduced its elastic compute cloud, known as EC2 clusters, allowing individuals to be charged a fee in exchange for services designed to meet the companies' storage needs (Alzahrani, 2016). At the same time, Amazon also introduced its simple storage service (S3), which enabled consumers to save their information online to a virtual space, known as the cloud (Alzahrani, 2016). After Amazon's cloud breakthrough, all major technology companies followed suit, including Google, Microsoft, and Apple.

Cloud computing provides a data storage medium. This permits companies to save information on a virtual server rather than to their personal computers or hardware systems (Alzahrani, 2016). Businesses have come to rely on this technology as a more convenient and cost-effective storage solution. The structure of cloud computing allows

businesses to provide on-demand customer service to manage their resources better and to salvage funds to devote to other areas of the business (Alzahrani, 2016). Along with the benefits of cloud computing, there are also some challenges. These challenges include security matters, service migration, and Internet connection disruptions, which can hinder cloud access (Alzahrani, 2016).

Prior research has indicated that many SME managers were unaware of or lacked knowledge about how cloud computing works and what it could offer their companies. Due to their lack of knowledge, some managers opted not to adopt the latest technology correctly, causing undesirable effects on their business (Avram, 2014; Carcary, et al., 2014; Oliveira et al., 2014; Park & Kim, 2014). The discussion in this section includes research studies designed to increase managers' awareness and knowledge of cloud computing and of what cloud-computing adoption entails. To learn more about cloud computing, Maresova and Halek (2014) conducted a qualitative, explorative study of 200 SMEs in the Czech Republic. The researchers proposed to identify the benefits and challenges associated with cloud computing in SMEs. The researchers acknowledged the United States is the world's largest market for cloud computing but noted that cloud computing is expected to increase in Europe as well.

Study findings showed that many respondents were unfamiliar with cloud computing, with only 8.17%, indicating that their business is currently using or considering cloud computing (Maresova & Halek, 2014). About a quarter of participants (26%) stated that cloud computing was associated with benefits like scalability and



flexibility, with 25% saying it was associated with online technical support, and 24% with benefits like the ability to work from home (Maresova & Halek, 2014). These SME employees also noted the presence of challenges, which include information security concerns, a dependence on the strength of the Internet connection, a lack of insight about cloud-computing options, the cost of implementing cloud computing and perceptions of the technology as being a low-priority item (Maresova & Halek, 2014).

Mohlameane and Ruxwana (2013) found that most companies were still using conventional information and communications technology (ICT) solutions, according to their qualitative case studies. Participating SMEs listed reasons including awareness of what cloud computing could offer to their businesses and a lack of the IT skills necessary. Study participants perceived conventional technologies as being costly to implement and maintain and proclaimed their need for technology to cut costs and increase computing affordability. Mohlameane and Ruxwana's (2013) collected data from 15 respondents from three SMEs in the Gauteng region of South Africa. Their findings supported their hypothesis, and previous discussions about the contributions cloud computing offers for SMEs, including no software licensing costs, smaller initial ICT investment costs and lower hardware and IT infrastructure costs. Mohlameane and Ruxwana (2013) concluded that cloud computing could serve as a replacement for traditional internal IT solutions for SMEs with the necessary resources.

A study by Price, Stoica, and Boncella (2013) focused on family and non-family businesses and the influence of innovation and knowledge on business performance.

Price et al.'s (2013) findings indicated that innovation was the strongest performance indicator. Price et al. (2013) found that knowledge permits a company to predict its business potential, more accurately make better determinations regarding the application of its human capital, financial investments, and technological capabilities. Innovative features are often business-specific, difficult to imitate, and hard to acquire without the necessary knowledge.

Wisdom et al. (2014) performed a literature review that established how different activities affect implementation. Wisdom et al. (2014) applied a narrative synthesis approach to compare theories on the adoption of inventions. Twenty theoretical frameworks were included in the research and divided into two groups: those with questions about the adoption process and those who showed a likelihood of implementing cloud computing, but still experienced issues (Wisdom et al., 2014). A relationship existed between the start of the implementation process and the awareness of a need for innovation, which was influenced by various factors. Wisdom et al. (2014) found that managers followed different ways to collect knowledge and possible solutions for their needs. The better the adoption process was understood, the better the perspectives in meeting the challenges (Wisdom et al., 2014). Findings indicated that innovation adoption is a process influenced by organizational characteristics, innovative features, individualities, and client characteristics. These characteristics change from the time the organization becomes aware of innovation, to the point where information has been acquired to the point of adoption (Wisdom et al., 2014).

### **Skills Needed for Cloud-Computing Adoption**

In their study of cloud service practices of SMEs, Lacity and Reynolds (2014) postulated that if SMEs had the necessary cloud-computing skills, they would achieve successful economic and business value. Lacity and Reynolds (2014) listed the following advantages of cloud computing as most significant when compared with IT service delivery: avoiding costs, saving costs, rapid technology deployment, scalability, the simplicity of management, and enhanced security and resilience. Lacity and Reynolds (2014) examined the practices applied by SMEs to overcome their challenges in acquiring the IT skills, gathering data from three SME founders and CEOs with technical expertise who had acted as IT managers in their businesses. The participating SMEs did not lack technical or IT management capabilities to drive their organizations. Lacity and Reynolds (2014) found that the other SMEs in their study had lean IT staffs with much less IT knowledge and experience with less acceptance of cloud computing than the SMEs with IT skills in their workforce. Price et al.'s (2013) discussion in the previous section also has relevance here. Price et al. (2013) found that knowledge and innovation, including acquired skills, are all closely related to the competitive advantage of a firm. The size of the company does not make a difference to the knowledge skills when it comes to the implementation of innovation, whether in a small or large business.

The empirical results of a study by Garrison, Wakefield and Kim (2015) supported the concept that both managerial and technical IT capabilities relate to successful cloud implementation and business performance. Managerial capability

encompasses the identification of needed technologies for improving business performance, which is one of the reasons for moving to cloud technology. Lacity and Reynolds (2014) recommended professional SMEs should acquire advanced IT skills to function at the same level as their users, external customers, and suppliers. Lacity and Reynolds (2014) further suggested those SMEs that already implemented technology or were moving to the cloud should emphasize on application of new skills and give less prominence to IT training. Celaya (2015) supported the hypotheses and outcomes stated by Lacity and Reynolds (2014).

### **Perceptions of Cloud-Computing Adoption**

It has taken time for researchers to focus on what SME owners perceive as beneficial or challenging during the implementation of cloud computing. Several studies were conducted about SMEs that did not implement cloud computing. The negative perceptions these SMEs held about cloud computing included a lack of knowledge of the technology, a lack of appropriate IT skills, an overall distrust of the technology, and cost and implementation implications (Lacity & Reynolds, 2014). Positive perceptions the SMEs held included ease of use and improved performance (Chen, Chuang & Nakatani, 2016; Hasan, Zgair, Ngotoye, Hussain & Najmuldeen, 2015).

One of the most significant negative perceptions of SMEs relates to the cloud's trustworthiness and reliability. This dynamic was discussed by Coppola (2013), who attributed the reasoning behind the European Commission's decision to execute "Unleashing the Potential of Cloud Computing in Europe," a strategy to increase the use

of cloud computing across all markets. The commission-based the strategy on SMEs being aware of cloud computing, but unaware of how to locate knowledge or information (Coppola, 2013). In other words, business owners know about the cloud's existence, but they do not know how to use it (Coppola, 2013). These companies are also concerned with the reliability of data protection and security. Often the contracts offered to companies are inflexible, with little room for negotiation (Coppola, 2013). Companies are concerned with whether they can rely on these outsourced means of data storage, especially when considering high-priority files.

Hasan et al. (2015) conducted a quantitative study to identify factors that influence the adoption of cloud computing by SMEs. The researchers used a search engine to trace concepts listed in articles between 2010 and 2015 as affecting the adoption of cloud computing by SMEs. Hasan et al. (2015) identified five factors that seemed essential for SMEs who were considering cloud computing. These factors included perceived ease of use, perceived usefulness, security, compatibility, cost, and top management support. Hasan et al. (2015) explained the perceived ease of use as being the amount of effort SMEs apply during the implementation period and equipment maintenance. Perceived usefulness referred to the SMEs' presumptions about how much technology would increase job performance (Hasan et al., 2015). These terms are aligned with Davis et al.'s (1989) TAM outlined previously.

Chen et al. (2016) used an exploratory study to discover the benefits of cloud computing as perceived by adopters and to examine how contextual factors affected the

relationship between cloud computing and its perceived benefits. Chen et al.'s (2016) findings indicated a relationship between the perceived benefits of cloud computing and variables concerning the type of cloud service, value chain activity, and business size. Chen et al. (2016) observed that businesses use cloud computing mainly for primary activities rather than for support activities. There was no significant difference in compound benefits among software-as-a-service, platform-as-a-service, and infrastructure-as-a-service. A breakdown by the type of cloud computing and firm size suggested that more SMEs used cloud-computing services than larger companies. Another proposition with a positive conclusion was that businesses might benefit more from enhanced business scalability than from cost reduction (Chen et al., 2016).

The literature review included information that IT skills are imperative for future business success. Many of the employees working for smaller companies lacked IT skills because they relied on IT skills provided by a limited number of IT administrators (Lacity & Reynolds, 2014; Shawish & Salama, 2014; Wei et al., 2014). A significant proportion of the employee pool did not share these skills. Possessing sufficient IT skills could support SME efforts to gaining economic and business values including cost savings, rapid deployment, management simplicity, and better security and resilience (Celaya, 2015; Ferry et al.; Lacity & Reynolds, 2014; Mohlameane & Ruxwana, 2013; Shawish & Salama, 2014). For SMEs, the perceived reasons for implementing cloud computing included data security, bandwidth quality, and costs, guaranteed uptime, performance and availability of cloud services, and quality of connectivity and speed (Mohlameane &

Ruxwana, 2013). Other factors included trustworthiness and reliability of the system, ease of use, usefulness, security, compatibility, top management support, and firm size (Chen et al., 2016; Hasan et al., 2015).

### **Benefits and Critical Success Factors of Cloud Computing for SMEs**

An extensive literature review of cloud-computing services indicated that cloud-computing utility could assist SMEs with their organizational, technological, and environmental concerns (Abdollahzadegan et al., 2013; Putnik & Wang, 2017; Stieninger & Nedbal, 2014). Benefits included providing enterprises with the ability to configure their computer resources (Gupta et al., 2013). Other factors included added savings, flexible services, improved customer service, enhanced data security and storage services, increased service delivery and management processes, access to on-demand and pay-per-use business models and better access to new markets (Khalil et al., 2014; Lian, Yen & Wang, 2014; Pearson, 2013). SMEs typically cannot spend large sums on technology investments. Cloud service providers, professional bodies and the government should strategically be involved in the diffusion of knowledge and the broader adoption of cloud computing (Senarathna, Yeoh, Warren & Salzman, 2016).

According to Mohabbattalab, von der Heide, and Mohabbattalab (2014), every SME could use cloud computing. It is simply a matter of the SMEs being provided with the information to use the technology properly. Cloud computing can provide data storage and other solutions that smaller companies, with their limited onsite IT departments, could not access before. Outsourcing to the cloud allows smaller businesses

to benefit from new application developments without spending money and resources (Mohabbattalab et al., 2014; Park & Ryoo, 2013). Cloud computing decreases the time and money needed to maintain and enhance infrastructure compared with onsite data storage (Mohabbattalab et al., 2014). These changes to the operational structure could permit SMEs to become players in local markets and also in the global arena (Ross & Blumenstein, 2015).

Ross and Blumenstein (2015) emphasized the power of computing and storage that cloud computing offers. These technologies provide improved scalability and elasticity, which makes cloud computing a low-cost, greener solution for IT services. Lim, Pua, Teoh, Ng, and Sim (2015) posited the green advantage ascribed to cloud computing includes its green organizational identity. A green environment, legitimacy, innovative green performance, and cost reductions are some of the features that have impacted the adoption of green IT by SMEs across the globe (Lim et al., 2015).

Abebe (2014) studied the adoption of e-commerce, entrepreneurial orientation, and SME performance to establish whether there is a connection between e-commerce adoption and SME performance. Abebe (2014) identified a positive correlation between the adoption of e-commerce and the average sales growth rate. SME adoption of e-commerce supported a positive annual sales growth rate, especially if the SME demonstrated a greater level of entrepreneurial strategy. Abebe (2014) concluded the adoption of e-commerce could have positive implications for business performance, as well as further streamlining operations and efficiency.



Avram (2014) exercised caution in blaming cloud computing for higher maintenance costs in research about cloud computing for business. Avram's (2014) findings indicated a relationship between moving to cloud computing and lowering investment costs needed to afford a business infrastructure. By gaining more experience and shifting more core business functions onto cloud platforms, cloud adoption was more complicated than initially imagined (Avram, 2014). Although cloud computing was gaining interest, many firms were experiencing rising costs since implementing cloud computing. These factors pointed to ignorance and a lack of knowledge of what was required for application and maintenance. Avram (2014) analyzed her findings with the intent to establish what small businesses should consider application and service. The study findings added to existing knowledge about computer analytics benefits SMEs could reap that were previously available only to large corporations. Cloud technology offered smaller firms the opportunity to use new applications and services they had not accessed before and to pay only for what they used.

Anshari, Alas, and Guan (2016) performed research on an online learning platform to learn whether online, educational resources from multiple channels could extend the benefits obtained by traditional learning platforms. The study included interviews with teachers who used online learning resources for instruction. Findings indicated that cloud computing, together with big data and the semantic web and combined with online learning resources, could enhance user experience and acceptance. Anshari et al. (2015) found that mixing these resources enriched the learning experience

of students and lecturers alike and that using these resources improved their entire experience. The integration of cloud computing with other technologies could help upgrade the learning prospects for students and all users.

In a study related to the research of Anshari et al. (2016), Chang and Wills (2013) investigated education as a service. The researchers used the University of Greenwich in a case study that focused on the improvement of business in education. The authors applied an Oracle-based, supply-chain model to the university's learning module to test a hypothesis. Their findings revealed that cloud projects could significantly improve by adding value by integrating the supply-chain software with the learning platform. The university's IT administrators seemed more in control of the learning platform and expressed satisfaction with the cloud-computing module. The students felt more at ease with their enhanced academic performance (Chang & Wills, 2013).

Consistent with the research studies mentioned above, Borgman et al. (2013) supported the adoption of cloud computing. The researchers used current literature and empirical methods to determine which components of an organization influenced the adoption of cloud computing. Borgman et al. (2013) used the TOE framework to assess the process by which a company's acceptance of innovation was influenced by either the company's technical, organizational or environmental contexts. The researchers used structured interviews in a survey of 669 global IT executives and other decision-makers about their cloud-computing adoption. Two clusters of 24 companies each were identified, consisting of SME executives who were using cloud computing and perceived

it as convenient. Findings supported the hypothesis that both technology and organizational context influence the decision-making of SMEs. Borgman et al. (2013) reported that peoples' adoption of cloud-computing technologies was more likely to occur if the people saw the technology as being extremely usefulness, coupled with significant support from management and a high level of competition within the organization.

Scalability and flexibility were emphasized as significant factors that drive the growing use of cloud computing. These systems could offer flexibility to commercial operations by providing on-demand and pay-as-you-go services (Kumar & Samalia, 2016; Young, 2015). Flexible platforms can adjust to the needs of different business owners while simultaneously improving their access to global markets (Ferry et al., 2015; Senarathna et al., 2016; Shawish & Salama, 2014). Studies about the adoption of e-commerce showed positive influences on SMEs' average sales growth rate, while SME e-commerce technology adopters had higher average sales growth than non-adopters and reaped these benefits without having to increase output (Abebe, 2014; Park & Ryoo, 2013). Cloud computing could offer SMEs a greater amount of power with computing and storage and help them to deliver services that were previously unaffordable (Avram, 2014; Mohabbattalab et al., 2014; Ross & Blumenstein, 2015). Combining cloud computing with other online resources could enhance the experience of users and ensure greater competency (Anshari et al., 2015; Chang & Wills, 2013; Borgman et al., 2013).

### **Challenges and Barriers to Cloud Computing for SMEs**

While research has shown the benefits of cloud computing and indicated favorable results, some studies also showed that many SMEs have problems with security and privacy, reliability and availability of the systems (Kumar & Samalia, 2016). SMEs tend to lack dedicated staff or knowledge of new technology (Avram, 2014; Lacity & Reynolds, 2014; Senarathna et al., 2016). The perception of risk and risk management in cloud computing is of concern regarding implementation.

Brender and Markov (2013) elaborated on the major risks of cloud computing in terms of security, regulatory compliance, and disaster recovery. The researchers investigated a sample of five Swiss companies at the Geneva School of Business Administration, with all respondents sufficiently understanding cloud computing. Findings indicated that risks increased when certain types of data were migrated. The findings supported Brender and Markov's (2013) hypothesis that it is necessary for financial companies to perform a risk analysis on all technology taking on such a large mission. Their insight could be extrapolated to any business used as a case study to learn about risk. One company's risk could differ from that of another business in the same range. Brender and Markov (2013) recommended that security, confidentiality, auditability and regulatory compliance risk should be considered before engaging in cloud computing.

Doherty et al. (2015) focused on the availability of cloud-computing services, which poses a potential barrier to implementation. Doherty et al. (2015) examined the

drivers and barriers to cloud-computing adoption by SMEs in Ireland, applying a quantitative research approach to collecting data by way of an online self-completion questionnaire forwarded to 1,500 SMEs in Ireland. Their findings indicated that Irish SMEs perceived the cost-benefit for their firms as one of the key aspects of cloud-computing adoption. Doherty et al. (2015) also discovered respondents' concerns about the continuous availability of the service further delayed the widespread adoption of cloud technology. Participants recommended that policymakers and cloud providers assure their users of the system's sustainability via ongoing investment in high-speed, broadband infrastructure, standardization of services and technology, and service compliance.

Many of the developing and developed economies nationwide consider SMEs to be the backbone and driving force of their markets. Various business managers outsource their IT processes to focus on core business and cut down on substantial IT costs (Li et al., 2013). A large number of SMEs are still reluctant to support the cloud industry, blaming the instability of their businesses on the implementation and maintenance costs of cloud computing (Li et al. 2013; Khan & Al-Yasiri, 2015; Kumar & Samalia, 2016). Osembe and Padayachee (2016) based their research on the argument that although cloud computing is regarded as a virtualization technology that uses the internet and remote servers to offer on-demand resources, SMEs still did not focus on the adoption and usage of cloud computing. The study was designed to focus on the perceptions of 42 managers about the benefits and challenges of cloud computing in the Gauteng region of South

Africa, assessing the scope of implementation and use of cloud-computing services. Findings indicated that 71.4% of respondents were using computing technologies in Gauteng. The challenges perceived by these SMEs ranged from high costs of deploying resources and maintaining hardware to global competition. Most of the SME managers who did not adopt cloud computing made their decisions based on what they thought that other SME managers choose to do in the same business environment. Other concerns focused on the experience of IT, pointing to SME managers who had already adopted the technology but were still experiencing issues with security (Osembe & Padayachee, 2016).

Khan and Al-Yasiri (2015) focused on identifying barriers to cloud-computing adoption caused by incompetence. Computing firms were outsourcing their IT operations to concentrate on their business and customer needs. Khan and Al-Yasiri (2015) observed that SMEs were still struggling to adopt technology as part of their business infrastructure and planning. Their hypothesis stated that challenges to cloud computing such as cloud knowledge, interoperability, security, and contractual consequences were obstructing SMEs from adopting the services. Khan and Al-Yasiri (2015) combined a general literature review with interviews conducted with cloud vendors and SMEs. The purpose was to formulate a stepwise framework for cloud adoption, streamlining the cloud adoption process for SMEs. Khan and Al-Yasiri (2015) confirmed that perceptions of knowledge, interoperability, and security were adversely impacting the cloud industry.

The framework created by Khan and Al-Yasiri (2015) as the outcome of the study could help bridge the gap between cloud vendors and SMEs.

Oliveira et al. (2014) used a more holistic approach to identify the barriers that influence cloud-computing adoption and identify its benefits. The researchers conducted an evaluation of the direct and indirect effects of technical, operational and organizational perspectives, covering concepts including security cost savings, relative advantage, complexity, compatibility, technological readiness, top management support, competitive pressure, and regulatory support. The researchers surveyed 369 firms in Portugal's manufacturing and service industries. The research model integrated the characteristics of cloud computing according to the TOE model and the DOI framework. Oliveira et al. (2014) indicated the five factors serving as barricades against the adoption of cloud computing were relative advantage, complexity, technological readiness, support by top management, and the size of the firm.

Human behavior and the technical environment also served as barriers against accepting cloud computing in the organization. Purohit and Singh (2013) studied how to best comprehend human behavior and gain an understanding of cloud computing and data leakage, working from the hypothesis that cloud is a mixture of many types of applications operating on the same platform and that users face challenges of data theft and loss. Purohit and Singh (2013) assumed that by preventing data from being stolen or lost, users trust the services would improve. Findings indicated a relationship between the prevention of data loss or theft and greater trust of cloud-computing services. Purohit and

Singh's (2013) recommended that data loss and leakage prevention services should be constantly monitored to detect any unwanted attempts to access or delete data from the cloud network. Purohit and Singh (2013) also suggested that security strategies and practices for any organization, domain or environment, whether real or virtual, be implemented using a holistic approach. Such efforts should integrate physical, logical and people factors without sacrificing any processes or rules. A study by Ahmed and Hossain (2014) on the same topic supported that research outcome.

Aamir, Hong, Wagan, Tahir, and Wagan (2014) used a systematic literature review to extract document information in tabulated form according to cloud-computing security challenges. A list of 62 security problems was extracted, of which confidentiality was indicated as the most significant security threat to cloud computing. The researchers identified other perceived risks, including integrity, availability, security, usability, reliability, and accountability. Aamir et al. (2014) pointed to the importance of information security and noted the complex issue of controlling sensitive information. Findings supported the hypothesis that people do not differentiate between private and public information, not because they do not want to, but because of ignorance. Many users do not pay sufficient attention to the information published on the internet. Hackers can exploit the resulting vulnerability. Aamir et al. (2014) recommended that any such issues be addressed before the implementation of cloud computing.



In summary, the literature reviewed in this section did not indicate a definite divide between the barriers preventing SMEs from adopting cloud computing and the challenges experienced once they have implemented cloud services. Most SMEs lack the knowledge and skills needed to work with service providers to ensure sustainability. The research identified barriers to cloud implementation, including risk, security, regulatory compliance and disaster recovery, confidentiality, and audibility (Brender & Markov, 2013; Khan & Al-Yasiri, 2015). Constant availability of the service, costs, and sustainability of services were also identified as barriers (Doherty et al., 2015). Some of the perceived barriers resulted from cloud users' incompetence in maintaining and sustaining the cloud utility, specifically deploying resources, maintaining the systems, and being able to compete globally (Osembe & Padayachee, 2016). The lack of knowledge and skills was identified as the greatest barrier for both users and likely adopters of cloud services, while other barriers included interoperability, security, and contractual requirements (Borgman et al., 2013; Khan & Al-Yasiri, 2015). New adopters also face the challenges of relative advantage, complexity, compatibility, technological readiness, top management support, competitive pressure and organizational support (Oliveira et al., 2014). Data loss and leakage, as well as confidentiality, pose challenges (Aamir et al., 2014; Ahmed & Hossain, 2014; Purohit & Singh, 2013).

### **Complexities Faced by SMEs in the Adoption of Cloud Computing**

Many cloud service providers give SMEs their personal views on the positive and negative aspects of cloud computing, but do not offer them information about the

feasibility of cloud implementation. As a result, SME managers must try to make sense of the offerings from each service provider (Subramanian et al., 2014; Yew & Goh, 2016). Researchers recommended that SME managers gain extensive knowledge before being held responsible for making decisions for their companies (Subramanian et al., 2014; Yew & Goh, 2016).

Another complexity factor is that SMEs must adapt their current operations to suit the requirements of cloud computing. This is a time-consuming and complicated process, especially if SMEs need to shift their operations to multiple cloud platforms and services (Ferry et al., 2014; Wu et al., 2013). Because of operational changes, the coordination and implementation of cloud computing and the need to ensure security through encryption, SME managers are solely responsible for the planning and implementation of the cloud (Borgman et al., 2013; Li et al. 2013; Palmié et al., 2015). The virtualization project, the network structures, and the maintenance of the project require IT SMEs to provide informed input and to accept accountability for the outcome (Borgman et al., 2013; Li et al., 2013; Palmié et al., 2015). Virtualization refers to the creation of virtual versions of an enterprise's servers, storage devices, and operating systems. SME managers must be knowledgeable about the technology and about how cloud services could support their business (Wu et al., 2013).

Raza, Adenola, Nafarieh, and Robertson (2015) explored the slow adoption of cloud computing in the industry and the impact the IT workforce can have on the entire operation. They focused on the perception that most SMEs do not have time for system

and network securities and would rather hand their network computing to the cloud service providers. Cloud vendors know how important data security is to SME businesses and that most SMEs perceive security as the main issue when deciding whether to use it. The vendors promise to deliver quality services when tending to the security and reliability issues of customers' data. This action leaves the IT staff feeling insecure about their positions in the company and their jobs (Raza et al., 2015). Raza et al. (2015) observed that even those participants who were experienced in the application of cloud computing and had extensive knowledge understood that the IT manager's job was put at risk by embracing cloud technology. The study findings supported the hypothesis that a factor behind the slower progress of cloud-computing implementation was the fear of job loss for IT administrators. Raza et al. (2015) concluded that most IT employees need to learn more about cloud computing, arguing that acquaintance with the cloud-computing utility and its processes could boost their confidence in the application of cloud technology and resolve their innovation concerns (Raza et al., 2015).

Jelonek, Stępnia, Turek, and Ziora (2014) explored mental hurdles that may contribute to the complexities perceived by SMEs in Poland and may impact the use of cloud computing. Anticipated mental barriers included lack of trust, incomplete knowledge of cloud computing and beliefs that the changes were not necessary. Jelonek et al. (2014) found a positive relationship between a lack of trust in the cloud utility and its operations and the knowledge of IT administrators. The chief information officers did not perceive insufficient knowledge as a high barrier because they were familiar with

cloud operations. Lack of knowledge was found to be a major barrier for IT administrators at a more tactical level, though. Chief information officers could recognize the advantages of cloud systems and rarely assessed implementation as a complex barrier to adoption. Mental obstacles regarding the complexity of cloud implementation came from IT managers at a certain level, from inflexible system administrators, from the anxiety of undertaking risk, or a lack of interest in new solutions on the part of CEOs or IT managers (Jelonek et al., 2014). These findings were supported by Mohlameane and Ruxwana (2013) and by Purohit and Sing (2013).

Yigitbasioglu (2015) undertook a quantitative study about organizational pressure and top management support to assess the role institutional pressure plays in forcing senior management to adopt cloud computing. The researcher argued that the decision to adopt cloud computing resides with the top management team (TMT). The degree of pressure placed on the institution to adopt new technology would depend on the beliefs of the TMT regarding benefits and psychological readiness rather than on objective data about the new technology. Yigitbasioglu (2015) suggested that TMT support mediates institutional pressure to admit cloud computing as a solution. A TMT uncertainty about the employment of cloud computing might decide to copy the successful efforts of other firms, called mimetic pressure. Yigitbasioglu (2015) found that mimetic pressure positively correlated with TMT beliefs and that coercive pressure could positively be associated with TMT beliefs. Yigitbasioglu (2015) explained coercive pressure as dominant behavior and pressure from external elements like customers or suppliers and

from associations and regulators who believe that the TMT should adopt new technology. Yigitbasioglu's (2015) findings supported his hypotheses about the pressure placed on the TMT by external factors to adopt cloud computing, revealing that the TMT makes decisions and is responsible for the expenses incurred. If the TMT does not have time to acquire sufficient knowledge, it will copy successful IT solutions from other companies. Such decisions predict problems for future maintenance of the system and business sustainability (Yigitbasioglu, 2015).

Gangwar et al. (2015) focused their research on determinants of cloud computing from organizational and human resources levels, integrating the TAM and TOE frameworks into their research and assuming that environmental variables directly impact the complexity of cloud adoption. Gangwar et al.'s (2015) research findings indicated that SME perceptions of ease of use and the cloud utility's usefulness are influenced by SME perceptions of relative advantage, compatibility, perceived complexity, organizational readiness, and top management commitment. Gupta et al. (2013) also focused on the issue of complexity in the adoption of cloud computing by SMEs, aiming to identify new factors and consider existing factors that influence SME approaches to cloud-computing adoption. Findings indicated an insignificant relationship between an SME's perception of cost savings and cost reduction and its perception of the complexity of cloud adoption. Security and privacy of data also seemed essential for the application of new technology (Gupta et al., 2013).

Taking a more technical approach, Garrison et al. (2015) examined the effect of relational, managerial, and technical IT-based capabilities on the successful adoption of cloud computing. Garrison et al. (2015) found a significant relationship between IT capability and the successful implementation of cloud computing. The researchers' assessment of the interrelationships indicated that IT knowledge and aptitude need to be more advanced when public and hybrid cloud delivery models were planned and installed. Also, more flexibility and agility are required from the technical staff to facilitate better performance in the public cloud. The discussions and findings on IT-based capabilities could serve as a guide for the successful application of cloud computing and enhanced performance of the business operations (Garrison et al., 2015).

A summary of the research literature in this section highlighted factors that contribute to complications of cloud adoption faced by SMEs. Researchers identified links between observed complexities and the barriers and challenges discussed in the previous section. A lack of knowledge and anxiety reported by IT employees concerning job loss and operational capabilities seemed to be a major factor behind the slow adoption of cloud computing (Raza et al., 2015; Garrison et al., 2015; Yew & Goh, 2016).

Mental blocks found to impact the complexity of cloud implementation were a lack of trust, a lack of knowledge and the perceived necessity of implementing new technology. Perceived ease of use and perceived usefulness contributed to the complexity of implementation if top management support was not received (Gangwar et al., 2015; Yigitbasioglu, 2015). Relative advantage, compatibility, and organizational readiness all

affected the adoption of cloud computing in complex environments (Gangwar et al., 2015). Other factors that contributed to the complexities faced by SMEs included reliability, sharing and collaboration and data security or privacy (Garrison et al., 2015; Gupta et al., 2013).

### **Summary and Conclusions**

A significant number of studies were designed to research the phenomenon of how SME managers perceive issues related to cloud computing. Many of these studies involved SME managers and owners, indicating perceptions of cloud computing being complex and even dangerous, particularly regarding cybersecurity. Existing literature provided valuable information about the adoption of cloud computing by SMEs, the perceived benefits, the barriers, and the apparent complexity of implementation. Researchers reported a general perception that SMEs need to keep pace with the increasing trend toward cloud computing and that SME managers often are unaware of the counter-measures in place to negate the associated risk. The literature review included information indicating a lack of empirical studies about adoption issues and a lack of data regarding the area of North East USA. Using this qualitative, descriptive, phenomenological study, I explored the lived experiences, perceptions, and mitigating decisions of SME managers regarding the adoption of cloud computing into their enterprises (Brender & Markov, 2013; Pearson, 2013; Purohit & Singh, 2013).

In Chapter 3, I discuss the proposed methodology and study design. Chapter 3 also includes descriptions of my role in the process, the participant selection process, and

study instrumentation. It also outlines procedures for recruitment, the data collection methodology, the data analysis plan and issues of trustworthiness.



### Chapter 3: Research Method

The purpose of this descriptive phenomenological study was to explore the lived experiences and perceptions of SME managers that might influence their decisions to adopt cloud computing into their enterprise. The population consists of managers of SMEs located in Maryland. This chapter contains discussions about the research design and rationale and the role of the researcher. This chapter also includes a discussion of the study methodology, with separate sections addressing instrumentation, the field study, and the data analysis plan. In this chapter, I address the study's trustworthiness, including issues of credibility, dependability, transferability, and confirmability. The chapter also includes information regarding recruitment procedures, participation, data collection, and ethical procedures. The chapter concludes with a summary.

#### **Research Design and Rationale**

The purpose of this descriptive phenomenological study was to explore the lived experiences and perceptions of SME managers that might influence their decisions to adopt cloud computing into their enterprise. A single overarching research question guided the research:

RQ1: What are the lived experiences and perceptions of SME managers regarding cloud-computing decisions that might influence adoption?

I selected a qualitative design for this study. Consequently, quantitative design and a mixed-methods design were rejected. The present study collected information about the perceptions and lived experiences of SME managers and the factors that influenced

their decisions. I rejected quantitative and mixed-method designs because I did not wish to quantify data related to cloud-computing use (Bryman, 2016; Lewis, 2015). Views, experiences, and decision reasoning cannot be quantified, but should be explained, hence the need for a study of this type to be qualitative in approach (Bryman, 2016; Lewis, 2015). Because quantitative data were unnecessary for this study, a mixed-methods design would have been superfluous.

With this study, I gathered and presented participants' responses regarding cloud-computing technologies using a qualitative, phenomenological approach to generate deeper insight into SME managers' decision-making processes regarding cloud computing. Phenomenological studies are concerned with lived experiences gathered through in-depth interviews, an approach well suited to understanding SME managers' decision-making processes regarding the adoption of cloud-computing services (DePloy & Gitlin, 2016; Young, 2015). Little existing literature consists of phenomenological studies about cloud computing (Brender & Markov, 2013; Mohlameane & Ruxwana, 2014). This study contributed to narrowing this particular research gap.

Other qualitative approaches were deemed less appropriate as they did not fit the criteria for the proposed study. For example, case studies, grounded theory, and ethnography were rejected as research designs (DePloy & Gitlin, 2016; Lewis, 2015; Yin, 2013). This study was designed to provide information about managers' personal experiences rather than the results of experiences in a specific case, thereby excluding a case study approach (Yin, 2013). I also rejected grounded theory and ethnography for this

study because I am not focused on the development of new theories or the exploration of cultural issues (DePloy & Gitlin, 2016; Lewis, 2015). Future researchers may wish to conduct such studies and build on the phenomenological findings of this study.

### **Role of the Researcher**

I used a qualitative descriptive phenomenological approach to explore the lived experiences and perceptions of SME managers regarding decisions that might influence their decisions to adopt cloud computing into their enterprises. This study included information about SME managers' perceptions of cloud computing. These managers, who live and/or work in a specific area in Maryland, provided information (Giorgi, 2009). My role in this study was the primary instrument. As such, I administered the questions and collected participants' responses. I conducted interviews in a predetermined setting known only by the participants and me, with options that included participants' workplaces or a private room rented in a library. Through interviews and data analysis, I gained a deeper understanding of the phenomenon by assessing those who are directly involved and by analyzing their responses to unveil trends.

During the data collection and interview process, I strived to circumvent the influence of bias. I did this by transcribing the participants' responses and later asking them to confirm or refute the accuracy of the responses. I did so to avoid misconstruing information from the interviews. To further circumvent bias, I engaged in *epoche*, which is the suspension of judgment (Fusch & Ness, 2015). I administered the interview questions and maintained an objective perspective while listening to the participants,

recording their responses, and when necessary asking additional questions to elicit further detail. I ensured that I did not have a personal relationship with any participants to avoid influencing the interviews. The participants and I did not have any relationships with power dynamics like teacher/student or mentor/mentee.

I took several steps to reduce the potential for bias. First, I maintained a reflective journal of actions related to the study and audio recorded the interviews. I provided participants with opportunities for transcription verification to confirm legitimacy and accuracy. Finally, I used bracketing to eliminate the potential for bias. Bracketing consists of two components, which are my ability to distinguish and set apart my preconceived assumptions and my ability to revisit the data and better understand the material as a result of my growing understanding of the topic (Fisher, 2009).

In this study, I collected data using handwritten notes and audio recordings. Following the interviews, I read the notes to analyze the data further. In the later stages of the study, I transcribed the recorded interviews, providing opportunities to revisit the interviews later in the research. I facilitated a deeper understanding of the subject matter by revisiting the information at a later point in the process when I had acquired a deeper comprehension of the subject matter. Because bracketing entails two separate instances of reviewing the interview responses, this serves as another means to circumvent the potential for bias.

### **Methodology**

Study participants were SME managers in Maryland. According to the Small Business Administration (2018), Maryland was home to 581,712 small businesses in 2018, with those small businesses employing some 1.1 million workers. The Small Business Administration's (2018) listings include a variety of business types in 2015 in the United States, including 167,343 small-business employees working in health care and social assistance (45.6% of statewide employment in this sector); 145,712 professional, scientific, and technical services businesses (53.3% of statewide employment in this sector); 135,909 workers in the accommodation and food services industry (61.5% of statewide employment in this sector); 123,103 construction workers (85.7% of statewide employment in this sector); 98,449 workers listed as services other, excluding public administration (86% of statewide employment in this sector); and 95,066 workers in the retail businesses (32.7% of statewide employment in this sector). At the time of these data, small businesses in Maryland were responsible for 99.5% of statewide employment, along with 50.2% of all Maryland employees (Small Business Administration, 2018). The average income for people who were self-employed by their own private small business was \$53,626 in 2016 (Small Business Administration, 2016). For individuals who were self-employed at their unincorporated businesses, the average annual salary was \$26,691 (Small Business Administration, 2016).

In its annual report on small businesses in the state of Maryland, the Small Business Administration's (2016) report included information about firm sizes. This data

included that 92,411 of small businesses in Maryland had between one and 20 employees; 106,194 of small businesses in Maryland had between one and 499 employees (Small Business Administration, 2016). I excluded from this study the Maryland firms with 100 to 499 employees. Small businesses are defined in this study as those with fewer than 19 employees. A medium-sized businesses are those with between 20 and 99 employees.

### **Participant Selection Log**

According to the U.S. Census Bureau (2016), in 2010 the town of North East portion of USA had a total population of 631 with a projected population of 669 in 2016. A report by the U.S. Census Bureau (2016) indicated a total of 75 active companies based in the town, with business sectors including; retail; real estate; professional services, including scientific and technical services; administrative support, including waste management and remediation services; educational services; health care and social assistance; food services and hospitality; and arts, entertainment and recreation (U.S. Census Bureau, 2010). The sample for this study consists of 20 SME managers in the North East portion of USA. The desired number of participants is 20, but the interview process continues until data saturation has been reached (Fusch & Ness, 2015). Data saturation occurs when new information is no longer being collected, like when participants begin providing repetitive answers (Fusch & Ness, 2015). I selected participants from among the SME managers who live and work in the town of North East portion of USA, with small businesses being those with fewer than 19 employees and

medium-sized businesses being those with between 20 and 99 employees. I expected to need no more than 10 participants to reach data saturation.

I used LinkedIn and Prince George's County Public Library's business database to access names and contact information for area SME managers. I sent e-mail invitations to potential participants to receive an adequate number of responses. In the e-mails, I outlined the research being conducted and ask managers to participate in in-depth interviews. The e-mails also contain an informed consent form highlighting issues involving participant privacy, the study process, and the voluntary nature of participation. I included my contact information in the e-mail and asked recipients to contact me to communicate their willingness to participate in the study.

### **Instrumentation**

In this study, the researcher is the primary instrument. The interview questions were developed to collect information related to the research question (see Appendix A). The questions are divided into two sections, which are initial thoughts and business-related thoughts. Preceding this information is a short demographic questionnaire for the participants to complete (Appendix B). The section addressing business-focused thoughts includes inquiries about participants' lived experiences of cloud computing. The interview questions in this study are structured to formulate a rich, detailed story from the participants' lived experiences about cloud computing in business. As part of the interview protocol, each participant was asked to provide basic demographical

information, like age, race, socioeconomic status, and years of business-related experience.

### **Field Study**

I conducted a field test with two small-business owners and one expert in qualitative phenomenological research to confirm the content validity of the interview questions. Three participants were sufficient for this field study, as field studies involve the opinion of two to three experts in the field concerning the topic or design (Denscombe, 2014; van Teijlingen & Hundley, 2002). Through the field study, I confirmed the interview questions are objective, understandable and valid (Denscombe, 2014; van Teijlingen & Hundley, 2002). Field study participants were asked to comment on their perceptions of the interview questions and the clarity of the questions and provide suggestions for improvements to this data collection tool (Denscombe, 2014; Yin, 2013). I have confirmed the validity, clarity, and simplicity of the survey. My objective was to use the field study to remove any shortcomings or challenges that may obstruct the collection of data in the main study. The test panel was given the script, the problem statement, the purpose statement, and the research questions. They were asked to answer the following questions:

1. Are the questions clear and easy to understand?
2. Will the answers to the questions answer the research questions?
3. Are the questions appropriate given the type of research method and design?
4. Are there any suggested changes, additions or deletions?



Two out of the three participants had experience with the cloud, and these two participants agreed the questions flowed from general to specific. These participants also observed the perception of business owners in this IT field could be influenced by television advertising and programming by the buzz within the community of business owners and by community norms. One of the participants had expert design knowledge about phenomenological design, and this participant observed the questions were appropriate and offered suggestions for streamlining. One of the participants suggested changing the questions to Likert-type survey questions. This would require the study design to be changed to a mixed-method, which would not be appropriate for the present study. This participant's suggestion was overlooked, as it would compromise the design of the study.

### **Procedures for Recruitment, Participation and Data Collection**

Following approval from the Institutional Review Board (IRB), I e-mailed various SME managers located in the North East portion of USA. I acquired potential participants' details, such as names and e-mail addresses, from public sites, including LinkedIn and Prince George's County Public Library's business database, which are both free services. I distributed e-mails to 50 potential participants to receive 10 confirmed responses. If 10 confirmations were not made after e-mailing 50 people, more prospective participants will be contacted until this number is met. This sample size is sufficient for a phenomenological study (DePloy & Gitlin, 2016; Lewis, 2015). Additional participants were solicited as needed until data saturation was reached (Fusch & Ness, 2015). I

explained to participants as well as the voluntary nature of their involvement. Interviews were set for times mutually agreed upon by the participants and I. Interviews may be held at a neutral location, like a local coffee house or public library. One day before the interview, participants were e-mailed with a reminder of the meeting the following day.

Before the start of each interview, I discussed the informed consent with each participant and asked for a signature on the form. I assigned a personal identification number to each participant, using this identifier in tape-recording and in all associated data. Before each interview, I read aloud an introduction to the study. The interview included a list of questions that were consistent among participants (see Appendix A). Interview questions were open-ended to encourage detail and discussion, with clarifying questions added when necessary. Interviews lasted approximately one hour, with the time depending on the length of participant responses. All interviews were audio-recorded. After completing the questions, I asked the participants whether they would like to add further input. I thanked participants for their time and remind them again about confidentiality. I took minimal handwritten notes during each interview and audio record each interview as well, to ensure that all information was gathered accurately (DePloy & Gitlin, 2016; Lewis, 2015).

Following the interview, participants are required to partake in transcription verification to ensure data and interpretation accuracy. To do so, I provided the participants with their completed transcription to check the transcription for validity. Transcription verification is a process that was used to reduce the possibility of

researcher bias by enabling participants to reread their responses and make changes. I transcribed audio recordings and field notes into Microsoft Word. Participants were given one week to make any changes, comments, or edits, with reminder e-mails sent at the end of the week. If a transcript was not returned, I assumed that no changes were needed, and the transcript became part of the data. Data collection did not commence until I receive IRB approval and until participants provided their informed consent (Gray, Cooke, & Tannenbaum, 1978).

### **Data Analysis Plan**

Interviews continued until data saturation occurs. The objective of the interviews was for the researcher to collect enriched material that is saturated in detail. To communicate the value of this information about this study, I organized the information according to the research question. I organized the information collected from the participants by using NVivo 12, a data analysis software program.

With the help of NVivo 12, I organized participants' responses according to the research question. NVivo 12 was used for coding and correlation purposes of identifying emerging themes, topics or similarities among participants' responses (Edhlund & McDougall, 2016). NVivo's features include "character-based coding, rich text capabilities, and multimedia functions," all of which apply to "a range of qualitative research designs and data analysis methods" (Zamawe, 2015, p. 13). After completion of interviews, the written transcriptions, and transcription verification, I uploaded the interview responses into NVivo 12 by manually uploading all transcriptions. I used

NVivo 12 to identify similar response patterns, thereby gaining insight into the similarities among the experiences of SME managers regarding cloud computing. The NVivo 12 tool uses coding and correlates the responses in a way that both organizes the material and unveils trends. After processing the material in NVivo 12, all the similarities and trends were noted. The similarities shared by participants regarding their lived experience were used to elicit larger themes about the experiences of SMEs and cloud-computing technologies.

Along with revealing the larger themes, NVivo 12 was used to detect minor themes. Being minor, these smaller themes may not address the research question as solidly but may provide areas of future research. Certainly, it is essential to consider the procedures for disrepute cases, if such a situation were to arise. I addressed this through the regular procedures of this study, as the interview transcriptions that were uploaded into NVivo 12 were already been verified at this time. If I were to come across any confusion about the participants' responses, it would have already been addressed during this process. Not only will this step be performed to ensure accuracy and reduce the potential for bias, but to ease the data analysis process as well.

### **Issues of Trustworthiness**

For the data to be considered credible, it is imperative that all materials reflect participants' honest, uninfluenced and unbiased perspectives. To ensure honesty, accuracy, and reliability, researcher bias must be avoided. This was accomplished by

asking the participants to partake in transcription verification. Researcher bias was mitigated through bracketing, maintaining an audit trail and keeping a reflexive journal.

### **Credibility**

In qualitative research, credibility depends on the plausibility of the data. There are several steps that researchers can take to ensure credibility: (a) acknowledging researcher bias; (b) maintaining a written account of steps taken in the study, otherwise known as transcription verification; (c) providing thorough accounts of the participants' responses; (d) verifying the study data through member checking; and (e) triangulating data (Noble & Smith, 2015). I maintained a written, reflexive journal to record all the steps taken during the study and to note any biases. These biases were also disclosed previously. Transcription verification enables participants to confirm and/or make changes to their responses in order to reflect their exact statements and avoid ambiguity or confusion. The participants will be asked to only read over the questions to confirm or refute what was stated. I do not encourage the participants to make sweeping changes to their statements, but, rather, to read over their responses to ensure that I interpreted and transcribed their responses correctly. The purpose is to ensure that I transcribed the participants' responses accurately and did not incorrectly interpret any of the information. Because the research relies heavily on participants' responses, responses must be accurately recorded. It was imperative to maintain a paper trail of all steps taken throughout the process of data collection.

**Dependability**

Dependability reflects the reliability of research data. Research data is found to be reliable if the study can be replicated and reproduced (Moon, Brewer, Januchowski-Hartley, Adams, & Blackman, 2016). Although it is possible to reproduce a similar study, it is not possible to replicate data using a phenomenological design. Phenomenology involves specific information that is experienced first-hand by participants, and the experiences of these participants will not be identical to the experiences of others. Even if the subject matter is similar, it will not be exact. To allow other researchers to conduct a similar study in the future, it was necessary to create an audit trail that includes detailed accounts of all steps taken. Such detail contributes to study dependability, giving others the ability to read the reflexive journal and comprehend the intricacies behind the research process.

**Transferability**

Transferability is the extent to which data can apply in another situation or setting, while still maintaining the results from the initial study. To achieve this, I provided a heavy description of the original study (Houghton, Casey, Shaw, & Murphy, 2013). This includes offering heavy descriptions that rely on participants' responses. To create transferability, researchers offered direct quotes from participants in the results section of the study. The transferability of this study was determined by whether the content was "useful to theory, practice and future research" (Moon et al., 2016, p. 17).

**Confirmability**

Confirmability is established when a researcher conveys a clear relationship between the data and the deductions in a manner that can be observed and duplicated. To ensure confirmability, my underlying bias should not impact any of the data collected in any manner whatsoever (Houghton et al. 2013; Moon et al., 2016). To ensure the confirmability of this study, I recorded all data collection throughout the study, including handwritten notes, audio recordings, interview transcriptions, and the final presentation of the study. Others can follow the audit trail to determine how data was collected and analyzed. I maintained a reflexive journal that contains handwritten notes, information about any biases, and recorded data about study processes. I also noted any changes, actions, and procedures taken on any given day. Duplication of a phenomenological study is not possible, but confirmability provided the information needed for researchers looking to conduct a similar study.

**Ethical Procedures**

As there were human participants in this study, it was critical to note the ethical procedures. I obtained IRB approval before the study commences. Once approval was granted, recruitment began. The participants were contacted via e-mail, and I provided the participants with all the pivotal information about the study. This e-mail served as an introduction. To participate in the study, participants were asked to read and virtually sign an informed consent form. The informed consent form outlined the participants' roles and details about how their participation may help to narrow the research gap about

the study. Participants were not permitted to participate in the study if they do not sign or send me a copy of the signed informed consent form.

The informed consent form also includes a shortlist of benefits and risks that are relevant to the potential participants. At this phase, I need to remain as transparent as possible in regard to the study so the participants are aware of all the details. I identified little benefit and little risk to participants involved in this study. Because all names are to remain confidential, there was little risk to participants involved in this study.

All participants were made aware that their involvement in this study is purely voluntary. Participants may also withdraw from this study at any point, for any reason, without consequence. Participants were to do so by contacting me via e-mail or telephone and indicating his or her desire to withdraw. I provided each participant with a unique identifier or PIN assigned at the time of the interview to keep their identities confidential. At this stage, all information related to the participant was removed from the study and permanently destroyed.

All of the data that were collected throughout this study were stored in a locked file cabinet that only I can access. The file cabinet was located in my home office. All computer data was protected by a password that is known only by me. I will keep all of the data about this study for five years following completion, after which all of the paper will be shredded, and files will be permanently deleted from the computer. The external hard drive had another layer of added security with its password-protected access required. After 5 years, this external hard drive will be burned.



### **Summary**

Through this qualitative, descriptive, phenomenological study, I researched the lived experiences and perceptions of SME managers in the North East portion of USA, regarding cloud-computing technologies and the associated risks, as well as the reasons they may consider using cloud computing. Several discussions were presented in this chapter regarding research design and the rationale for choosing a particular design, the role of the researcher, and study methodology. The chapter also included information about instrumentation, recruitment procedures, study participation, and data collection. The chapter also included information about issues of trustworthiness, with the associated questions of credibility, dependability, transferability, and confirmability. The chapter concluded with notes regarding ethical procedures and a summary. In Chapter 4, I present the research results.

## Chapter 4: Results

I present the results of this study in this chapter. The purpose of this descriptive phenomenological study was to explore the lived experiences and perceptions of SME managers that might have influenced their decisions to adopt cloud computing into their enterprises. The data gathered from this research were used to answer the research question regarding the lived experiences and perceptions of SME managers about cloud computing and their related decisions regarding the adoption of cloud computing.

This chapter includes the field test that informed the design of the data collection and interview process for the study. Next, I present an overview of the research setting and the participants, including their demographics. Then, I describe the process for data collection and analysis and the steps and processes conducted for the trustworthiness of the study. Finally, the data analysis, including main themes and minor themes, in response to the research question are detailed. Additionally, a hierarchy diagram will visually represent the data coded into themes. Also, a detailed codebook is provided to complement the hierarchy diagram to identify each theme with a description and indicate the frequency of data coded at each theme. The coded themes are supported by direct quotes from each of the participants in this study as a way to provide thick and rich descriptions of their perspectives on using cloud computing. The chapter concludes with a summary of the findings.

### **Field Study**

A field test was conducted with two small-business owners and one expert in qualitative phenomenological research to confirm the content validity of the interview questions. Three participants were sufficient for this field study, as field studies involve the opinion of two to three experts in the field concerning the topic or design (Denscombe, 2014; van Teijlingen & Hundley, 2002). Through the field study, I confirmed that the interview questions were objective, understandable, and valid (Denscombe, 2014; van Teijlingen & Hundley, 2002). Field study participants were asked to comment on their perceptions of the interview questions and the clarity of the questions and to provide suggestions for improvements to this data collection tool (Denscombe, 2014; Yin, 2013). There was confirmation of the validity, clarity, and simplicity of the survey. The objective was to use the field study to remove any shortcomings or challenges that may obstruct the collection of data in the main study. The test panel was given the script, the problem statement, the purpose statement, and the research question. They were asked to answer the following questions:

1. Are the questions clear and easy to understand?
2. Will the answers to the questions answer the research questions?
3. Are the questions appropriate given the type of research method and design?
4. Are there any suggested changes, additions, or deletions?

Two out of the three participants had experience with the cloud, and these two participants agreed the questions flowed from general to specific. These participants also

observed the perception of business owners in this IT field could be influenced by television advertising and programming by the buzz within the community of business owners and by community norms. One of the participants had expert design knowledge about phenomenological design, and this participant observed that the questions were appropriate and offered suggestions for streamlining. One of the participants suggested changing the questions to Likert-type survey questions. This would require the study design to be changed to a mixed-method, which would not be appropriate for the present research.

### **Research Setting**

To collect data for this study, managers of SMEs who were located in the North East portion of USA were interviewed. Small businesses, with 19 employees or fewer, and medium businesses, with 20 to 99 employees, were the target population. Face-to-face interviews were conducted with individuals who qualified for this study. The interviews were conducted in a predetermined setting known only by the participants and researcher, with options that included participants' workplaces or a private room in a library.

### **Demographics**

The sample for this study included 16 male and female SME managers who worked in this region. Two-letter pseudonym initials identify the participants instead of their names. There was diversity in age, race, and education levels. The participants also held different types of careers, including those who worked in the legal field, child care,

religion, real estate, and other fields. Some had never used cloud computing and others had been using it for years. The participant demographics are detailed in Table 2.

Table 2

*Demographics of Study Participants.*

Participant	Gender	Age	Race	Education level	Years of company being in business	Business type or job role	Used cloud computing	Years using cloud computing
KB	Male	46–55	African American	Master's	1-5	Pastor	Yes	3–5
KF	Female	56+	African American	Master's	11+	Real estate	Yes	5+
VT	Female	56+	African American	Master's	11+	Daycare manager	No	N/A
VA	Male	46–55	Asian	Bachelor's	11+	Accountant	Yes	5+
HM	Male	56+	African American	Master's	11+	Pastor	Yes	5+
DO	Male	46–55	African American	Master's	11+	Attorney	Yes	5+
AG	Male	46–55	African American	Doctoral	11+	Doctor	Yes	5+
ME	Male	56+	African American	Master's	6-10	Real estate	Yes	5+
EM	Male	46–55	African American	Master's	11+	Technical field	Yes	5+
GW	Male	56+	African American	Master's	11+	Accountant	Yes	5+
RO	Female	56+	African American	Master's	11+	Dentist	Yes	< 1
JA	Male	46–55	Hispanic	Master's	11+	Real estate	Yes	5+
BW	Male	56+	African American	Doctoral	11+	Doctor	Yes	5+
CP	Female	46-55	African American	Master's	11+	Sales	Yes	5+
MD	Male	56+	African American	Master's	11+	Business owner	Yes	5+
PM	Male	N/A	African American	Master's	11+	Attorney	Yes	5+

### **Data Collection**

To collect data for this study, managers of SMEs were located in the North East portion of USA. Small businesses, with 19 employees or fewer, and medium businesses, with 20 to 99 employees, were the target population. Sixteen SME managers participated in this study. Face-to-face interviews were conducted with individuals who qualified for this study. I conducted 12 of the interviews at the participants' workplace and four were conducted in a private rented room in a library.

Each interview lasted less than 1 hour. The interviews were recorded and field notes were taken. First, demographic information about the participant was collected, followed by their general perception of cloud-computing technologies and their lived experiences using cloud computing in business. The interview questions were created using an open-ended structure, which encouraged participants to provide more thorough responses. I administered the interview questions and maintained an objective perspective while listening to the participants, recording their responses, and when necessary asking additional questions to elicit further detail. The collection process continued until data saturation was reached. I transcribed the participants' responses and the participants checked the transcription for accuracy and to reduce the potential for bias as a form of transcription verification. Once transcriptions were approved, the participants' responses were uploaded into NVivo 12 by QSR, a software program.

In this study, data were collected using handwritten notes and audio recordings. Following the interviews, I read the notes to analyze the data further. In the later stages of

the study, the transcription of the recorded interviews provided opportunities to revisit the interviews.

There were no variations in data collection from the plan presented in Chapter 3 except that the number of participants was reduced from the goal of 20 to a confirmed 16. Data saturation was accomplished by the 16th interview so no further interviews were required. There were no unusual circumstances encountered in data collection.

### **Instrumentation**

In this study, the research question guided me in administering the interviews. The interview questions in the interview script were developed with the intention of collecting information related to the research question. Questions regarding the experiences of SMEs that led to their decision to use or not use cloud computing were asked. In addition, I included questions regarding their thoughts and feelings regarding cloud computing. Preceding this information was a short demographic questionnaire for the participants to complete. Each participant was asked to provide basic demographic information, such as age, race, and years of business-related experience. The section addressing business-focused thoughts included inquiries about participants' lived experiences of cloud computing. The interview questions in this study were structured to formulate a rich detailed story from the participants' lived experiences about cloud computing in business.



### **Data Analysis**

With the help of NVivo 12 by QSR, the participants' responses were organized according to the research question and interview questions. NVivo was used for coding and correlation purposes to identify emerging themes, topics, or similarities among participant responses (Edhlund & McDougall, 2016). The data analysis process proceeded under a sequence of steps. First, I transcribed interviews into Microsoft Word documents, turning each interview into a written narrative of the verbally expressed content. Second, the transcribed interview data was read and reread. Third, I noted relevant codes referring to the responses from the participants as they connected to the main research question. Fourth, I developed potential themes and subthemes based on different codes. Fifth, I reviewed coded data, themes, and subthemes to refine the themes. This process permitted me to define and name the themes by capturing the essence of what each theme was and what aspects of the data each theme captured. Following data analysis, a unique identifying name was assigned to each code. Finally, after manually coding the interviews, I uploaded the coding files on NVivo 12. The software was crucial in determining the hierarchy of the generated themes and systematically processing and reanalyzing them.

I used NVivo 12 to identify similar response patterns, thereby gaining insight into the similarities among the experiences of SME managers regarding cloud computing. After processing the material in NVivo 12, all the similarities and trends were coded as nodes. The similarities shared by participants regarding their lived experience were used

to elicit larger themes about the experiences of SMEs and cloud-computing technologies. I continuously revisited the literature review throughout coding and analysis to assure the integration of the salient topics, themes, and theoretical frameworks that informed this study and the questions posed to the participants. Along with revealing the larger themes, NVivo 12 was used to detect minor themes. The frequency of the coded themes—identifying them as being main or minor—is included in the codebook. Although minor codes were smaller themes and may not address the research question as solidly, they may provide areas of future research. This research study can also inspire future work because of the evidence in trustworthiness.

The following treemap (Fig. 1) was formulated to show hierarchical data as a set of nested rectangles of varying sizes. The size represents the amount of coding at each node. The size indicates the number of nodes coded or the amount of coding references. The treemap was scaled to where the rectangles (nodes) were considered in relation to each other, rather than as an absolute number. The larger the area, the higher the frequency of code per theme, thus the main theme. The smaller rectangles, minor themes, are relevant to contextualize the results of the interview data in an effort to understand vivid and detailed perspectives. To complement the hierarchy treemap, the codebook (Table 3) was created. The codebook indicates the details of all coded data including the theme, description of data coded at each theme, and frequency of references.

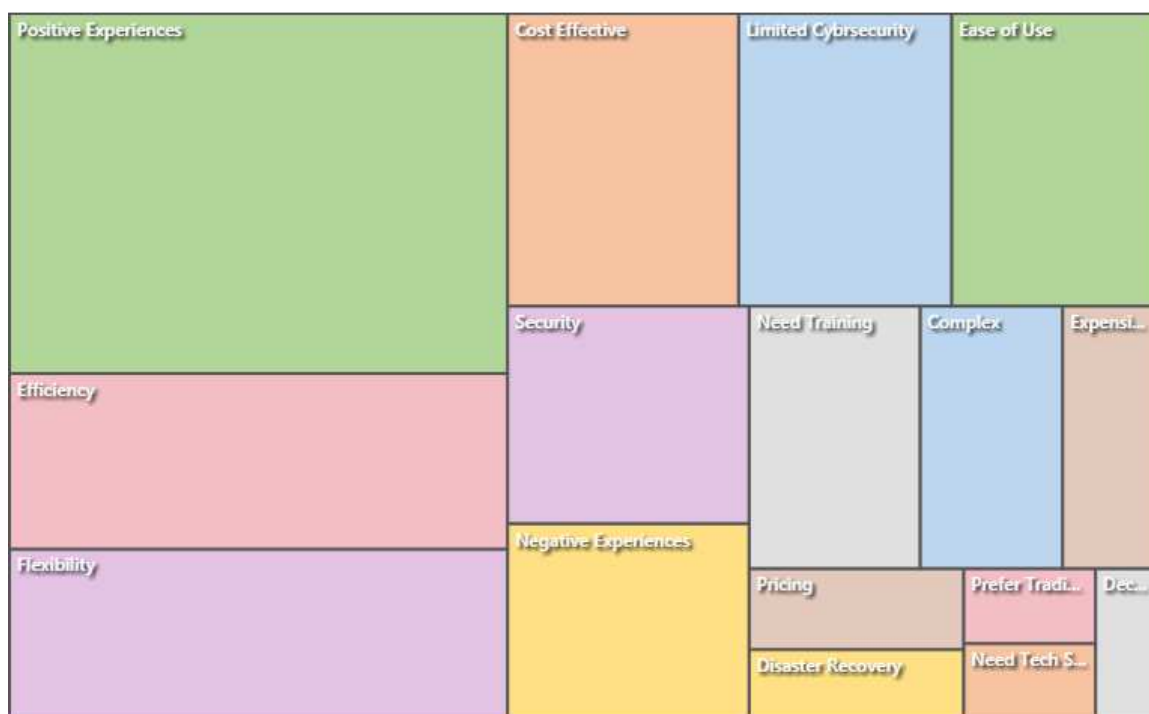


Figure 1. Hierarchy treemap for coded nodes to represent themes.

Table 3

*Codebook*

Coded theme	Description	References
Complex	Cloud computing is complex to use	15
Decreased human error	Integration of technology had eliminated handwritten error	4
Disaster recovery	Recovery of data after disaster or other failure	6
Ease of use	Easy to use cloud-computing system	24
Efficiency	Fast business processes	35
Flexibility	Able to do different aspects of business processes and flexibility in being able to access files from anywhere at any time	34
Limited cybersecurity	Not secure; privacy and information security	25
Need tech support	Professional technical support for cloud-based software	4
Need training	Need training on cloud computing	16
Negative experience	Negative aspects or perceptions	19
Positive perception	Positive aspects or perceptions	72
Prefer traditional methods	Prefer other ways of conducting business instead of the cloud	3
Pricing	Use of cloud impacts business finances, including ability to make money, cost effectiveness, or being too expensive	7
Cost effective	Less overhead, less space needed, less personnel needed	27
Expensive	Expensive software for small and medium businesses	10
Security	Data saved in secured server	21

**Evidence of Trustworthiness****Credibility**

In qualitative research, credibility depends on the plausibility of the data. I took several steps to ensure credibility: (a) acknowledgement of researcher bias; (b)

maintained a written account of steps taken in the study, otherwise known as an *audit trail*; (c) provided thorough accounts of the participants' responses; and (d) verified the study data through transcription verification (Noble & Smith, 2015). I maintained a written reflexive journal to record all the steps taken during the study and to note any biases. These biases were also disclosed previously. Transcription verification enabled participants to confirm and/or make changes to their responses in order to reflect their exact statements and avoid ambiguity or confusion. The participants were asked to read over the questions only to confirm or refute what was stated.

### **Transferability**

Transferability is the extent to which data can apply in another situation or setting while still maintaining the results from the initial study. To achieve this, a heavy description of the original study was provided (Houghton, Casey, Shaw, & Murphy, 2013). This included offering heavy descriptions that relied on participants' responses to support the generated themes from the analysis. Providing a thick, rich description of the results and the participants enables the reader to determine whether the results can be transferred to their specific population.

### **Confirmability**

Confirmability is established when a researcher conveys a clear relationship between the data and the deductions in a manner that can be observed and duplicated. To ensure confirmability, underlying bias should not impact any of the data collected in any manner whatsoever (Houghton et al., 2013; Moon et al., 2016). To ensure confirmability,

all collected data were recorded throughout the study, including handwritten notes, audio recordings, interview transcriptions, and the final presentation of the study. A reflexive journal was maintained that contained handwritten notes, information about any biases, and recorded data about study processes. I noted any changes, actions, and procedures taken on any given day in the reflexive journal and maintained an audit trail.

### **Dependability**

To allow other researchers to conduct a similar study in the future, it was necessary to create an audit trail that included a detailed account of all steps taken. Such detail contributes to study dependability, giving others the ability to read the reflexive journal and comprehend the intricacies behind the research process.

### **Study Results**

The purpose of this descriptive phenomenological study was to explore the lived experiences and perceptions of SME managers that might have influenced their decisions to adopt cloud computing into their enterprise. The single, overarching research question that guided the research was used to explore the lived experiences and perceptions of small- and medium-sized enterprise managers regarding cloud computing and their related decisions, which might influence adoption. The main themes about lived experiences and perceptions regarding cloud computing that arose were largely positive, specifically: (a) availability of training, (b) flexibility, (c) efficiency, (d) cost-effectiveness, (e) ease of use, and (f) assurance that data were safe in the cloud. The themes of the factors that may influence the choice not to use cloud computing were: a)

concern for compromised security of data, b) fear of cybercrime, and c) complexity of software, which would mean that there would have to be time spent learning the software. The themes that were identified about things that might have increased discomfort with using cloud computing were: a) making the software license more expensive and b) making it more complex and requiring too many software updates. The themes about factors that may increase a willingness to use or increase comfort with cloud computing were reported as a) a need for more training to be offered by providers to ease the complexity of working in the cloud, and b) a need for professional support for cloud-based software either by phone or e-mail. Table 4 contains the display of themes addressing the overarching research question.

Table 4

*Themes and Participant Endorsement*

Themes	# participants endorsed	% participants endorsed
Positive experiences		
Availability of training	14	87.5%
Flexibility	7	43.75%
Efficiency	6	37.5%
Cost-effectiveness	5	31.25%
Ease of use	4	25%
Assurance of data security	3	18.75%
Negative experiences		
Fear of cybercrime	9	56.25%
Expensive licenses	8	50%
Software complexity	5	31.25%
Concern for security of data	3	18.75%

### **Positive Experiences**

The majority of the participants discussed their lived experiences, which include positive experiences of using cloud computing in their businesses. There were significantly more references coded for positive aspects and perceptions of using cloud computing than there were negative ones. There were 72 references of data coded for positive aspects or experiences, whereas there were only 19 coded for negative reasons and experiences. The main themes that arose, for positive experiences were: a) more training which makes it possible to enjoy using cloud computing b) the flexibility that cloud computing provides c) the efficiency in business when integrating cloud computing into the work processes, d) the cost-effectiveness of cloud computing for a business, e) the ease of use of cloud computing, and f) assurance that data were safe in the cloud.

In addition to the significantly larger amount of data coded for positive perceptions as compared to negative perceptions, there were also significantly more study participants who reported positive lived experiences with cloud computing. Specifically, there were 87.5% of the study participants who reported positive lived experiences and perceptions of cloud-based systems in their business as compared to the study participants who had negative lived experiences and perceptions of using the cloud and thus do not use it in their work. Although 56.25% of the participants were concerned with cybercrime, the number is reduced with more training on how to combat cybercrime. Some participants view the availability of training in cloud computing to be too



expensive. The majority of the participants expressed the need for more training to help them function well and remain competitive in their business.

The positive aspects are described in more detail next in the ascending order of the number of participants who endorsed it. Because the availability for training using cloud computing had the most endorsed for the reasoning of positive lived experiences and perceptions, it will be described first, as the main theme.

**Availability of training.** Data were also coded to understand more about the factors that would positively influence the lived experiences and perceptions of the study participants and increase their willingness to use cloud computing in their business. The two factors that would increase a willingness to use cloud computing would be to offer more training and to have professional support. Specifically, 14 of the participants reported that the availability of training in cloud computing makes it possible for them to stay versatile with cloud-computing technology. According to EM,

Cloud-computing available training documentation enables you to stay abreast of the knowledge and skills to keep pace with the ever-changing IT technology. I read a lot of security documentation from my cloud services providers such as Microsoft Azure, Verizon cloud, and Amazon Web Services to avail myself of the crucial security information.

There was also one-quarter of the participants who mentioned the desire to have professional technical support on the phone or in e-mails available during all hours and days of the week.

**Flexibility.** For this study, flexibility was identified as a theme in influencing the participants in having a positive experience of using cloud computing; the theme was referenced 34 times, and seven participants endorsed it. Flexibility was defined as the different, wide-ranging working processes that could be done within a cloud-based software. For example, AG described the flexibility of the ways that cloud technology was used when stating:

My positive experience with cloud computing led to my decision to adopt an electronic health record in my medical practice... and to use electronic prescribing. It has a lot of advantages to patients and doctors, especially eliminating handwriting errors/illegibility which helps to reduce the chance of the wrong drug being dispensed by the pharmacist. Also, I can instantly view my patient's medication history and won't have to reconcile medication lists manually.

VA discussed the impact cloud computing positively had on relationship-building with clients. Specifically, VA described:

As an accountant, my feelings about cloud computing is that it offers an opportunity to change and enhance the accountant-client relationship. With permission-based sharing, accounting files can be shared easily with the client. There is transparency with the status of work.

HM described the flexibility of the use of cloud computing as a way to reach a global audience and deal with the financial aspects of the church. HM said:

I am a young pastor and have had substantial lived experience with cloud computing. I could not see myself not employing cloud-based applications in my church administration. Every aspect of my church activity is computerized. My sermon is broadcast on the internet so that my members and nonmember all over the world see and hear my sermon. My premise is that God is not limited in one place or geographical area. I am commissioned to preach the Gospel of our Lord Jesus to the world so cloud computing has given me the tools to project my message across the globe. I am able to keep track of tithes and offerings as well as pledges made. I'm able to quickly generate a positive experience report of any kind in the church. The positive experience I have with cloud-based management software has influenced my decision to use cloud computing in my church. The cloud application made it possible for me to manage and keep track of online giving, text giving, and even send out giving statements to the congregation and any visitor. We stay connected with everyone.

PM mentioned the positive aspects of cloud computing's flexibility in uses:

Based on my positive lived experience with cloud computing, I decided to adopt cloud-based law management software for my law firm. The cloud-based law management software helps my firm to manage client and case records, important documents, appointments and schedules, deadlines, and accounting and billing which is very important in any law firm practice. With this system, my law firm can meet compliance requirements such as document retention policies and the

electronic filing systems of court cases. I like to use cloud-based software because they are more secure than our system.

KB discussed his lived experience based on the flexibility of cloud computing:

I decided to implement cloud-based church management software to help me in my church administration, accounting, and community outreach. It has helped me to keep my congregation and church employees in great communication with each other. Cloud-based software helps to integrate basic record-keeping simplifies how the staff manages information, tracks member involvement, reviews giving trends, enter contribution records and other pertinent information in the church. The software allows me to access information about the church from anywhere that I can have access to the internet. Information about the church is at my fingertips. As a pastor, my thoughts and feelings about cloud computing are positive. When we move into the cloud, we got tools for communication, discipleship, and all the finances are managed in one place. This makes the church administration easy to manage. Creating reports is easy and quick. My church data go with me anywhere I go.

PM described the positive experiences of flexibility:

Based on my positive lived experience with cloud computing, I decided to adopt cloud-based law management software for my law firm. The cloud-based law management software helps my firm to manage client and case records, important documents, appointments and schedules, deadlines, and accounting and billing

was which is very important in any law firm practice. With this system, my law firm is able to meet compliance requirements such as document retention policies and the electronic filing systems of courts. I like to use cloud-based software because they are more secure than our own system.

DO said that his lived experience with cloud computing has been phenomenal:

I only need an internet connection to access my data and applications from any location that I choose to work. Every application and every bit of data is fully available to me wherever I choose to work. My experience with the cloud has been great. Since my data is in the cloud, I can use my laptop to log into the system and continue to do my work uninterrupted from anywhere.

JA stated:

I have had a tremendous experience with cloud computing through my work in the field of real estate. With cloud technology, I am able to store thousands of real estate transaction files which include documents, photos, and other important content that are pertinent to having a successful business. I can work simultaneously on the document with changes saved in real-time with other real estate agents from two or more physical locations.

**Efficiency.** In this study, the theme efficiency was a theme for data that described the improved speed of a work process referenced 35 times and six participants endorsed it. The most important and positive aspect of using cloud computing was that cloud computing improved the efficiency of work processes for the participants in this study.

AG noted the efficiency in remarking, “Cloud-based solution makes it easy to respond to a patient problem in a timely manner. Previously, it would take days, weeks or even months to complete certain blood tests but now the process is quick.” BW discussed the efficiency of cloud computing when stating,

In the past, the filing cabinet has been my source of storing patient records. This system was not efficient because I was faced with a significant risk of data theft or damage. Many times, paper records are easily lost or stolen and could be completely destroyed by flood or fire.

DO stated clearly, “With the cloud, my legal practice runs efficiently.” JA also discussed lived experiences of the efficiency of using cloud computing:

Cloud-computing technology makes it easy for me to store, share, and access data especially when working outside the office. This makes the buying and selling process more efficient and productive. I can do business faster, more productive, and efficiently, while at the same time reducing expenses and costs.

KF described his positive lived experiences, how the efficiency of business processes due to cloud computing impacted productivity and thus provided more revenue when saying:

This takes my real estate business to a higher level. I can take action on the spot and quickly and confidentially close deals. I wouldn’t have been able to become the top performer in my area without a cloud-based application. Cloud computing is the way to go in the real estate business. Services like MailChimp and constant

contact make it quick and simple to not only send out e-mails but also to track who's opening which, what links are being clicked on and other information to help identify prospects. As a real estate agent, the cloud is such a game-changer for me. It changes the outlook of my business. I have a competitive advantage. Conducting my real estate business in the cloud makes a lot of sense considering the huge benefits cloud delivers. I have the advantage of an efficient lead management system which makes it possible for me to interact with other brokers and agents from various cloud-based marketing some participants lacked services that help with capturing, developing, and managing leads. This is huge in real estate.

VA's job duties became more efficient by using cloud computing. VA described her lived experiences:

As an accountant, my job largely involves heavily scanning of documents such as invoices, account statements, client data for tax return filing, purchase order. Internet-based transactions require the electronic format of these documents to replace the printed versions. With cloud computing, I am able to collect these e-format documents with ease and have them available for use. My decision to move to a cloud-based accounting application helped me to integrate different applications such as banking app with accounting software and maintain the document as integrated applications and share various transaction information.

GW talked about how the efficiency of cloud computing impacted several aspects of the business. GW said:

As a CPA, I love to embrace cloud computing because the technology is profitable for my business. There is an ease of scalability, an increase in work efficiency, cost of operating my business is low. Those clients I prepare tax returns can get their refunds quicker. I have less and less paperwork to manage.

**Cost effectiveness.** Another main theme that arose out of the factors that influenced

positive perceptions of using cloud computing was cost-effectiveness; the theme was referenced 27 times and five participants endorsed it. BW noted the positive impact of cloud computing on his work and to the benefit of the patients when sharing, “Clinical data analysis test is done faster and more cost-effective rate than ever before. Patients do not have to wait for too long to get their results back. This is extremely beneficial for patients who require some serious tests.” JA also mentioned the cost-effectiveness of cloud computing when starting,

Some factors that influence me to use cloud computing are reliable storage and security and cost-efficient operating solutions with no overhead. I bought an affordable subscription package with Amazon Web services which makes it possible for me to pay every month instead of putting a lot of money in one lump sum.

ME also described the positive impact and cost-effectiveness:



I decided to adopt cloud-computing technology in my business, otherwise, I wouldn't have been able to stay afloat in the real estate competitive market. The cloud brokerage approach is the only way to go. With the cloud, I get links to resources that provided online services and I am able to carry out my transactions with less office space, lower overhead, and less staff. My clients can access their documents online securely and can append digital signatures when appropriate. Gmail and Zoho are the two online integrated cloud application that offers a number of tools to operate my business completely online and it's very inexpensive. The virtual environment that makes it possible to maintain less office floor space with agents operating remotely, reduce reliance on office staff and being able to server-client by using the latest available technology.

KF shared the ways that cloud computing was cost-effective:

Lower overhead cost...with my business in cloud, I am able to work remotely instead of at the office. It reduces the possibility of a brokerage's overall office space because with cloud storage or documents, I do not need as much storage space for physical files.

GW described:

Cloud technology really speeds up processes and reduces IT overhead and allow my accounting business to overcome the previous limitations and propel my business to greater profitability. The cloud offers more affordable and is easy for handling processes. It eliminates the need for software and hardware of even

additional IT staff. I could see significant cost savings and improved business insight.

CP reported different aspects of cost-effectiveness for using cloud computing. CP said:

I have been in the field of cloud computing for 10 years now and based on my lived experiences with it, I decided to adopt cloud in my business. My decision stems from the limited resources and technical expertise in setting up the required infrastructure needed to compete in the highly competitive market of this day. Most of the vendors are beginning to offer customized options to suit my business needs... and allow me to rent some IT equipment such as servers, disk storage on pay-as-you-go basis which removes the need for me to buy and setup expensive hardware, network components, and operating system application. The cost of operating my business is low. I don't have the need to purchase expensive servers and operating hardware.

MD expressed issues of cost-effectiveness as a reason for the positive perceptions of cloud computing:

All of the applications cost me a little amount to use per monthly basis. My experience with the SaaS application has been positive. I do not need to invest in expensive server infrastructure. The SaaS application that I'm using is easy to license and very easy to get started. It does not require a complex setup to make it work. The cost of operation is far less than if I were to buy the software on my

own. I do not have to employ an expensive IT engineer for setup. It eliminates the capital expense of buying hardware, operating systems cost, the cost of paying for power and cooling.

**Ease of use.** The ease of use of the cloud-based system was the main theme identified in the data analysis; the theme was referenced 24 times and endorsed by four participants. The ease of use meant making the process of the business easier and also that the cloud-based system was easy to operate. BW remarked on his lived experiences of how cloud computing made aspects of business easier. BW stated:

Cloud-based medical records made it easier for me to collaborate or share with other doctors' patient's medical records. Now the use of cloud-based medical records of patient care documentation makes it easier for doctors to share information, see the results of interactions between other physicians and the patient and provide care that wholly considers what the patient has experienced with other doctors.

PM described the benefits and ease of use:

When we move into the cloud, we customize the cloud-based software to adapt to the structure of our firm. Creating reports was easy better than the beefy system we were using before. Before, it would take days to create a report and it was not easy to keep track of all the cases to make sure that key information and deadlines are not missed. We can work with ease, flexible, and secure. I can get access to

my data anywhere and work as if I am in the office. My data go with me anywhere I go.

DO stated, “It is easy to use with excellent customer support.” KF told about the easy processes of using cloud computing in business: “Everyday communication and collaboration become much easier and more efficient than traditional solutions. The cloud-based systems make it possible for me to share customer information and data through the internet and mobile devices.”

**Assurance of data security.** The assurance that data were secured was a key component in the overall positive perception of cloud-based systems and a factor in influencing the choice to use cloud computing; the theme was referenced 21 times during the analysis of the data and endorsed by three participants. PM described the issues of data security:

I am always concerned about protecting my client data in the firm. My firm moved into a cloud-based system in the last 10 years and the experience has been phenomenal. The security information from the documentation gives me confidence in data security. There has not been any incidence of a leak of sensitive data. I am happy to move into the cloud.

DO describe his lived experiences with needing assurance of data security and told that “at first, it was not easy to move to move to the cloud because of the security concerns, but the legal practice management software that I am using is well secured.” EM also discussed assurances of data security based on his lived experiences:

I'm using the public cloud as a complementary network. I'm expanding into the public cloud to basically backup, some of my information... archiving information into their cloud provides me durability and also reliability. I know that if I have my systems or mass data backed up into their cloud, then my data is durable because I don't anticipate the corruption of my data to be reliable... so my data is safe and secure. I'm taking advantage of their security. It is very accurate, and I can't secure it in my environment. I collect people's credit card information, so I find it safer to save that data into the cloud than on-premises because then it's more difficult for a hacker to penetrate.

### **Negative Experiences**

Whereas the majority of the participants had positive lived experiences and feelings about cloud computing, there were 56.25% of the participants who had negative lived experiences and perceptions of using cloud-based systems in their business. There were 19 data coded for negative experiences and that included data of negative aspects even from those participants who have an overall positive view of the using cloud.

RO is one of the participants who had no experience in the cloud-based system in the business. This participant believed that it was too complex or complicated, and the transition cost is vague. RO said:

I am very leery of learning new technology that could enable me to adopt cloud computing. In my opinion, cloud computing is complex, and the way to obtain transition costs is unclear, so I will not use it in my business. I would not want to

delve into expensive transition costs to change to cloud computing. I will continue to use the traditional method. I don't even use online banking. In my business, I deal with cash. I request all my patients pay me in cash. I cater mostly to the older folks, and they are comfortable having to pay cash.

VT also did not use cloud computing because of concerns regarding privacy, security, and disaster recovery. She stated, "I operate a small daycare and have been doing this for 30 years. I don't use cloud computing and would not use it for obvious reasons such as privacy, information security, and disaster recovery."

### **Factors Influencing Choices Not to Use Cloud Computing**

Each of the study participants discussed factors that would influence them in a choice not to use cloud computing. The four factors identified were: a concern for fear of cybercrime endorsed by nine participants, expensive licenses endorsed by eight participants, Software complexity endorsed by five participants, and concern for the complexity of the software endorsed by three participants.

**Fear of cybercrime.** There were nine of the participants who discussed the fear of cybercrime as a factor that influenced a choice not to use cloud computing. For example, VA, and eight other participants reported, "a fear of cybercrime which could be destructive to the business." Although nine of the participants mentioned "a fear of cybercrime which would be destructive to business" as a factor that could detract from using cloud computing, the large majority (9:14) of the participants still found protection from cybercrime in the cloud-based systems that they chose to use in their workplace. For

example, KF discussed security from cybercrime, “The cloud allows me to securely store and share documents and files with my clients and colleagues, so I don’t have to depend as heavily on sending attachments and other cumbersome methods.”

**Expensive licenses.** In response to a question about what factors would increase discomfort with using a cloud-based system in their business, eight of the participants mentioned that they would have an increased discomfort if the licenses became more expensive. EM discussed the importance of free or inexpensive licensing:

I’ve looked at the pricing system and it’s quite amazing. It’s affordable and they will let you use some of their services for free. It is really amazing because then it gives you time to really understand those services and test them and be able to see how valuable they might be to you. All you have to do is use the application, so you can have the practice of setting it up on Amazon with an initial cost. But then later on just using and maintaining that application will be a breeze and you will save a lot of money and then you will not need a paid System admin in the house or some other company or contractor.

**Software complexity.** There were five participants who shared their concern about the complexity of cloud-based software as a reasoning factor for not using the technology. AG and four other participants stated that a “complexity of software is an issue and it may not be easy to spend time to learn the software.” Each of five participants discussed their lived experiences and perceptions on the software complexity factor that would increase discomfort with using cloud computing. The factor that would

deter them from wanting to use cloud computing would be an increased complexity of the software, especially if it meant that there would be frequent software updates.

**Concern for compromised security of data.** Although the majority of participants used cloud computing, three of them shared their concern about security issues of data being compromised. RO stated:

I have computers that I use but not heavily involved in cloud computing. I store all the medical records and patient files in a file cabinet in my office. In my opinion, cloud computing is complex and not secure. I am not using cloud computing and would not use it for some obvious reasons such as privacy, information security, and disaster recovery.

VT shared similar sentiments:

I do not want to use cloud computing in my business rather, I will continue to use the traditional method. I don't even use online banking. In my business, I deal with cash. I request parents of the children to pay me in cash. I don't even use social media. All your secrets will be out there in the world.

Although three of the participants reported concerns for compromised security of data as the primary factor influencing a choice not to use cloud computing, 87.5% of the participants do use cloud computing and have not had issues of compromised security. Indeed, although EM mentioned the concern of compromised data security, EM actually used cloud computing as an extra security measure. EM reported:



I have the cloud as a backup and secondary system. I try to back the important data into the cloud just in case my primary system fails. We can have a natural disaster power outage for a long, extended period. Then my business continues to run.

**Increased complexity and updates.** There were also five of the participants who reported that they would find an increased complexity in cloud-computing processes and an increased amount of software updates a deterrent to using cloud computing. The participants felt uncomfortable always to have to deal with software updates especially if the system has to be temporarily shut down for the updates to take effect. Sometimes there could be a loss of income while the system is down for updates.

### Summary

In this chapter, the researcher described how the research was executed by exploring the lived experiences and perceptions of SME managers that might have influenced their decisions to adopt cloud computing into their enterprise. There was a significant positive response in their perceptions of using cloud-based systems in their businesses. The main themes regarding cloud computing that arose were largely positive, specifically because of: a) Availability of training, b) flexibility, c) efficiency, d) cost-effectiveness, e) ease of use and f) assurance that data were safe in the cloud. The themes of the factors that may influence the choice not to use cloud computing were: a) fear of cybercrime, b) making the software license more expensive, c) making the software more complex and requiring too many software updates, and d) concern for compromised

security of data which would mean that there would have to be time spent learning the software. In the next chapter, the researcher will discuss the implications of these results and how the detailed descriptions of the main and minor themes will influence the ways that the experiences of using cloud-based systems (or not) impact SMEs.

## Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this descriptive phenomenological study was to explore the lived experiences and perceptions of SME managers that might influence their decisions to adopt cloud computing into their enterprises. In the study, I sought to gather and analyze the experiences that influence SME managers' decision to adopt cloud-computing technologies. This study may then be used toward the development of strategies to address mitigating issues, such as privacy and security concerns, in the adoption of cloud computing. An increased understanding of addressing cloud-computing concerns might help present and future SME managers to consider the transition to cloud computing not only Maryland, but in other locations as well. The final chapter contains the interpretation of findings, limitations of the study, recommendations, implications, and conclusion.

### **Interpretation of Findings**

Cloud computing is believed to be a great tool for SMEs to address their growing needs in this continuously evolving society. According to Abdollahzadegan et al. (2013), Brender and Markov (2013), and Khalil et al. (2014), SMEs can benefit from cloud computing in countless ways, including organizational, technological, financial, and environmental functions. However, SME owners and key stakeholders also face difficulties in fully adopting cloud computing due to the possible risks and uncertainties of the transition process. In the literature, barriers to cloud-computing adoption include security issues, costs and resources, and lack of IT knowledge and capacity.

The research question guiding the study was “What are the lived experiences and perceptions of SME managers regarding cloud computing and their related decisions, which might influence adoption? To address this research question, I performed a qualitative phenomenological analysis. I chose this research design because, according to Bryman (2016) and Lewis (2015), participants’ experiences cannot be explored and explained in numbers but should be discussed in an in-depth manner. I conducted interviews with participants to explore their lived experiences in cloud computing. A total of 16 SME managers participated in this study where interviews were audio-recorded and transcribed. I performed a phenomenological analysis of the participants’ responses, focusing on their lived experiences in cloud computing and the factors that might impact their decision to practice cloud computing. The phenomenological approach allowed me to access a deeper insight into SME managers’ decision-making processes regarding cloud computing and present it to a larger audience through this research study. NVivo12 by QSR was also crucial in assisting me in uncovering the most significant lived experiences of the participants. The software aided in the systematic coding and tabulation of the study themes to address the research question.

From the analysis, the experiences can be divided into three categories: (a) positive experiences, (b) negative experiences, and (c) suggestions of the participants based on their experiences concerning the adoption of cloud computing. Under positive experiences, six themes emerged. Another four main themes were generated under negative experiences. Finally, one key theme was formed, reporting the suggestion of the

participants on how SME managers can better accept cloud computing. Specifically, positive experiences received the greatest number of endorsements, which pertained to the following:

- Availability of training needed to keep pace with the ever-changing technology.
- Flexibility and the ability of the company to adjust and pattern their systems to the trends and practices in the global market today and the increased capacity to access business data and files from anywhere at any time.
- Efficiency and the overall expected improvement in a company's business processes or increased speed for business processes.
- Cost effectiveness and the overall reduction in costs or savings of the company as they shift to cloud computing.
- Ease of use and the benefit of accessibility by relying heavily on technology.
- Security and the protection and storage of data.

Meanwhile, the negative experiences had eight underlying themes. The themes pertained to the barriers or issues that SME managers believe are hindering them from fully adopting cloud computing. In addition, these are the overall negative views of the participants with regard to the adoption of cloud computing. The connected themes were:

- Limited cybersecurity, which pertains to concerns on data safety, data privacy, and potential security breaches.
- Expensive/pricing; participants have found that the shift to cloud computing involves expensive licenses and maintenance.

- Complexity; participants have found that cloud computing is difficult to use, thus needing more training to improve the abilities of the users. Participants have a strong perception that more knowledge and skills are needed to successfully integrate cloud computing into their business processes.
- Concerns for data security; the participants have serious concerns about the security of the data placed in the cloud.

Finally, the third category discussed was the suggestion of the participants in improving the willingness of SME managers to accept and consider adopting cloud computing in their companies. Specifically, the key recommendation was to increase the training and support for SME managers and their staff members. This needed training and support is the belief that SME managers need to develop a better understanding of the risks and benefits of adopting cloud computing.

### **Positive Experiences Influencing SME Managers' Decisions**

From the analysis, the majority of the interviewed SME managers (87.5%) had a positive lived experience related to the concept or practice of transitioning to cloud computing. The SME managers shared six key advantages they believe would occur as they shift to cloud computing: (a) training, (b) flexibility, (c) efficiency, (d) cost effectiveness, (e) ease of use, and (f) security. Looking closely at these themes, the positive experiences are interrelated and can be summarized to the SME managers' beliefs on how their companies' overall processes may develop and improve over time.

Others viewed the availability of training, which was considered positive by many participants, as negative because they felt it was too expensive.

The participants' most significant experiences were (a) training, (b) flexibility, (c) efficiency, (d) cost effectiveness, (e) ease of use, and (f) assurance that data were safe in the cloud. These themes all corroborated with the literature and have been discussed extensively by different scholars and researchers. Overall, several researchers have guaranteed not only the ease of use of cloud computing but, more importantly, its effect on the performance of the SMEs (Chen et al., 2016; Hasan et al., 2015). Abebe (2014) discussed how the adoption of cloud computing can result in countless benefits and overall improved business performance in terms of restructuring the operations and efficiency of a company. An example could be the flexibility of the companies as they are able to offer a convenient payment system through different types of pay-as-you-go services (Kumar & Samalia, 2016; Young, 2015). Technological platforms allow companies to be flexible as they improve their strategies and processes, aligning them to the demands and trends of the global market (Ferry et al., 2015; Senarathna et al., 2016; Shawish & Salama, 2014).

With cloud computing's ability to open more opportunities for SMEs, these companies become more empowered. According to Gupta et al. (2013), cloud-computing capacity allows enterprises the ability to regulate their resources more efficiently. Several benefits shared were additional savings, service flexibility, enhanced customer services, data protection, and access to different on-demand business models practiced globally

(Khalil et al., 2014; Lian, Yen & Wang, 2014; Pearson, 2013). Contrary to the perceived high costs of the adoption of cloud computing, the transition to cloud computing does not necessarily relate to spending more money and resources (Mohabbattalab et al., 2014; Park & Ryoo, 2013). Some researchers believe the adoption of cloud computing becomes more advantageous and cost effective over time. Lim et al. (2015) reported how the adoption of cloud computing not only improves overall business performance but can also help promote a green environment. SMEs that employ cloud computing can enjoy positive performance and cost reduction while limiting the use of resources that negatively affect the environment. Table 5 displays the themes in the supporting literature generated from the literature review in Chapter 2.



Table 5

*Positive Themes and Their Corresponding Literature*

Positive themes	Supporting literature
Training	Coppola (2013); Lacity & Reynolds (2014); Shawish & Salama (2014); Watson (1973); Wei et al. (2014)
Flexibility	Khalil et al. (2014); Kumar & Samalia (2016); Ferry et al., (2015); Lian et al. (2014); Pearson (2013); Abebe (2014); Chen et al. (2016); Hasan et al. (2015)
Efficiency	Senarathna et al., (2016); Shawish & Salama, (2014); Young (2015)
Cost effectiveness	Mohabbattalab et al. (2014); Park & Ryoo (2013)
Ease of use	Khalil et al. (2014); Lian et al. (2014); Pearson (2013)
Security	Not discussed, more seen as a barrier or challenge

**Negative Experiences Influencing SME Managers' Decisions**

Under the second category or the negative perceptions that influence the SME managers' decision to adopt cloud computing, several themes were also revealed from the analysis. Specifically, the most significant were the: (a) concern for compromised security of data with their fear of cybercrime, (b) complexity of software and (c) expensive pricing or increased cost of the software. Indeed, the participants shared relevant and pertinent concerns. As seen in the previous category, positive data on the security of cloud computing were not presented. This solidifies the finding that stakeholders are heavily concerned with the data's security once stored on cloud.

Companies usually value confidential information and they have since expressed their fear of their data being compromised by hackers and other attackers. Coppola (2013) supported this perception or experience stating that companies hesitate to adopt cloud computing as they have concerns with the storage of highly-confidential data. Further, Brender and Markov (2013) and Kumar and Samalia (2016) discussed the risks on privacy and security with the cloud-computing systems and the storage of the companies' files and other valuable data.

According to several researchers, the negative experiences of business companies and their stakeholders stem from the lack of knowledge and awareness about the benefits and risks of cloud computing (Lacity & Reynolds, 2014; Shawish & Salama, 2014, Wei et al., 2014. Similarly, participants of the current study discussed how business owners and their employees need more technological knowledge and skills before fully adopting the changes. Coppola (2013) emphasized how the business owners are aware of cloud computing but are unable to maximize the potential results due to their lack of IT knowledge and skills. Similarly, Lacity and Reynolds (2014) echoed negative beliefs highlighted how there is a lack of information about technology and several misconceptions on the security, complexity, and costs Researchers were also well aware that the transition to cloud computing is not easy and could even be a complicated or complex process (Avram, 2014). Again, SMEs and their stakeholders are hesitant to adopt cloud computing due to the instability of businesses and the maintenance cost that they may need eventually (Li et al. 2013; Khan & Al-Yasiri, 2015; Kumar & Samalia,

2016). Ultimately, another relevant barrier is the preference for traditional strategies and management. There are business owners who are impervious towards change, this is then aligned to one of the study's key frameworks or the resistance to change theory by Watson (1973). Based on this theory, there are individuals who would prefer to follow the status quo and are not welcome to the idea of change. Table 5 contains the display of themes, discussing the negative perceptions uncovered from the study and their supporting literature.

Table 6

*Negative Themes and Their Corresponding Literature*

Negative themes	Supporting literature
Limited cybersecurity	Ahmed & Hossain (2014); Brender and Markov (2013); Coppola (2013); Pearson (2013); Purohit & Singh (2013).
Complexity	Avram (2014); Mohabbattalab et al. (2014)
Expensive/pricing concerns Pricing	Khan & Al-Yasiri (2015); Kumar & Samalia (2016); Li et al. (2013); Lacity & Reynolds (2014); Li et al. (2013); Khan & Al-Yasiri, (2015); Kumar & Samalia (2016)
Security	Ahmed & Hossain (2014); Brender & Markov (2013)

### **Limitations of the Study**

With the completion of the current research study, the researcher observed several limitations which future researchers can use as references as they conduct their studies in

the future. As this is a qualitative phenomenological study, the information in the study heavily relied on the data shared and presented by the participants. The researcher is then unable to control or monitor the completeness and honesty of the participants' responses from the interview questions. To minimize this limitation, the researcher warranted that the participants were comfortable and at ease during the interviews. The researcher ensured that the setting was in a peaceful and quiet location in order to avoid unnecessary interruptions. The researcher also constantly reminded the participants that their identities will not be revealed or identified in any way.

Another limitation was the restricted information about some of the demographic information of the participants. This study was not reliant on incorporating the demographic data of the participants, so the possibility may exist for all of the participants of a cohort, such as all Caucasians, all African Americans or all Asians. In addition, the gender of the participants was similar as well, where the participants could be all women or all men. The study was limited to those who voluntarily agreed to take part in the study and to the experiences of SMEs from the North East portion of USA. Further, two participants have never used cloud computing and lacked IT knowledge and experience. Therefore, their lack of knowledge may have limited their ability to fully discuss the overall positive and negative experiences of cloud computing.

### **Recommendations**

Based on the study results, the researcher also formed several recommendations which the future researchers can consider as they complete studies similar to the current

subject or topic. The recommendations were based on the improvement suggestions of the researcher, both in terms of the research study and the practice. The following recommendations were:

SME owners and managers could consider being more open and willing to explore the information that might help them to decide on the adoption of cloud computing. By investigating the advantages and risks of cloud computing, providing information regarding cybersecurity and how cloud computing can be used might increase their willingness to explore these options. SME owners can weigh the potential values of the adoption and have a better understanding as they decide on whether or not they should implement cloud computing in their local businesses. The firsthand perceptions and experiences of the study participants combined with the study themes can assist the business owners in understanding the issue from individuals who have the same roles and positions as theirs.

Another critical finding of the current study was the significance of cloud-computing training. In line with this, Simple and informative training on cloud computing and how it might be beneficial should be made available to SME owners and managers. As shared in the current research study, the interviewed participants were honest in stating that most of the owners and employees have limited IT knowledge and skills. With the availability of training programs and short courses, SME owners could employ their newly acquired knowledge and skills to maximize the potential benefits of cloud computing in their local businesses. The suggestion could also help in reducing the

uncertainties and stressors of the participants with the current shift to cloud computing. Training programs are effective in building knowledge to their target audiences, and this could open more opportunities for the SME owners to explore the background of and other relevant information on the application of cloud computing to the local businesses. The third recommendation is for the SME owners and managers to conduct formal planning and evaluations of their business processes. By performing a comprehensive review of their business processes, they can be informed of their preparedness and capacity to accommodate the cloud-computing changes. Proper planning of the business owners could lead to awareness as their assessment will permit them to create informed decisions about the future of their businesses in terms of transitioning to cloud computing. Another critical component related to the third recommendation is planning through the gathering of feedback from employees and customers, which can assist the owners and managers in their decision on whether or not they should fully adopt the cloud-computing concept. By gathering the feedback of the other business stakeholders, business owners could weigh the positive and negative responses; and again, form decisions that are backed with data from the planning and evaluation sessions to be performed. Future researchers should consider conducting a multi-case study approach, covering both the experiences of SME managers who have transitioned to cloud computing and those who continue to follow their traditional business processes. Again, this was one of the current study's limitations wherein some participants lacked the proper knowledge and experience on the use of cloud computing. The researcher focused

on the overall experiences of all participants and did not further examine the different angles and variations of the two groups' responses. Therefore, by conducting multi-case study research, future researchers can better present the differences and outcomes in terms of the organizational or business performance of the two company structures. The study on the innovative companies versus traditional companies can provide clearer and more solid pieces of evidence on the factors that influence the decisions of the SME managers to adopt or not adopt cloud computing into their respective enterprises.

The third recommendation is for future researchers to consider triangulating the results from the suggested methodology. According to Clark and Creswell (2015), triangulation is a method of "corroborating pieces of evidence from different individuals" (p. 364). Therefore, the trustworthiness of data could be extended with the future researcher's triangulation of the themes from the two groups above the participants. Using these relevant findings, other researchers could focus on the participants' concerns and report data on how SMEs and their stakeholders can be assured that the positive aspects and benefits can outweigh the risks overall. Using the relevant findings of the current study, future researchers could focus on the participants' concerns and report data on how SMEs and their stakeholders can be assured that the positive aspects and benefits can outweigh the risks eventually. Future researchers could conduct a quantitative study that explores the impact of transitioning to cloud computing on the company's financial solvency.

The final recommendation was uncovered from the analysis of the responses of the participants on how the willingness of the SME managers to adopt cloud computing can be improved and the types of training SMEs would need to transition to cloud computing. Also revealed from the analysis, a study about how the fears people have about cloud computing can be alleviated and a comparative study on people who use and don't use cloud computing. The majority of the participants believed that with the proper training and education on the benefits and risks of cloud computing, SME managers could understand the use of cloud computing better. For Celaya (2015), Ferry et al. (2015), Lacity and Reynolds (2014), company stakeholders must take the time and effort to gain adequate IT skills which they can use as they transition to cloud computing. Mohlameane and Ruxwana (2013) and Shawish and Salama (2014) echoed the importance of investing in the skills of the company's stakeholders. With the study's framework by Watson (1973), the resistance of the individuals can be neutralized. Watson suggested for change agents to consider reducing the stressors of the individuals by offering training programs and educating the individuals on how they could successfully adapt to the environment and accommodate the suggested changes.

### **Implications**

The results of this study may have significant implications for social change for SME managers. The firsthand experiences and perceptions of the SME managers provide crucial and valuable information about the current state of cloud computing within the local SME groups. Most SME managers had a positive overall experience and reaction to



the adoption of cloud computing. Operating businesses in cloud-computing technologies come with huge opportunities, which include efficiency, cost savings, and ease of use, among others. Taking advantage of these opportunities could help SMEs to reduce the operational cost and increase revenue streams through improved products and services. From the finding of this study, some of the participants revealed that if they take time to read the security documentation from service providers such as Microsoft Azure, Verizon cloud, and Amazon web services, their concerns about the security issues were eased. They learned that there is a great deal of information about security measures to protect their data. According to some of the participants, spending time to educate themselves and asking questions where necessary will generate confidence and avail them of the resources needed to operate in the cloud. The available learning documentation may help them lessen the software complexity and show them the appropriate ways to handle software security updates. Also, participants felt that SMEs need to perform their due diligence when selecting a cloud provider. They need to select a cloud provider and subscription model that is cost-effective based on their volume of business operation. The choice of a subscription package may allow SMEs to pay affordable monthly fees to use technology resources. Also, the low maintenance cost and reduce installation time needed to launch cloud applications helped SMEs to be more efficient at managing technology costs. This can help SME businesses to thrive by creating cost-effective economic opportunities within the community, including creating jobs and providing reliable sources of income. However, despite these constructive findings, researchers and

practitioners must not overlook the concerns and fears of the SME owners and managers. The current study results could be useful and crucial in extending the literature about cloud computing. The current research study is unique as the researcher employed the firsthand perceptions and experiences of SME managers. According to Brender and Markov (2013) and Mohlameane and Ruxwana (2014), existing literature on phenomenological studies about cloud computing is very limited. Therefore, the results of the current study could be of great value to both the literature and practice; providing new and unique insights on the subject of cloud computing and its effectiveness when applied in SMEs. The current research study can then build the research gap on the firsthand and actual experiences of SME business owners on the adoption of and transition to cloud computing. Overall, the results of the current research study could help in guiding SME owners and managers in deciding whether or not their companies are ready to transition to cloud computing. In cases when companies are deemed to be unprepared for the transition, SME owners could further explore the areas in which they should shift their attention to and work to address their needs to better prepare in terms of their resources and skills. With the current research study, the key decision-makers of the SMEs now have access to the relevant concerns of SME owners and managers and can find more targeted ways on how these issues can be minimized. As a result, the experiences of the SME owners and managers found in the research study could be of valuable use to the SME community who are looking forward to improving their business processes.

Based on the responses of the study participants, cloud computing could indeed be a great advantage to some companies. The majority of the study participants viewed the adoption of cloud computing positively. The participants believed that the benefits outweigh the negative experiences and risks of adoption. However, the key concerns of the SME managers must still be given much attention. The participants' main concern is the need for training, increased security, and data protection. If SMEs availed themselves of the training that is available to them many of their fears would be eliminated. With the available training, SMEs managers will be well informed about the challenges of operating cloud-computing technology and will enable them to stay competitive in the market. Also, there are concerns about information relating to transition costs. The participants' main apprehension centered on the need for training, the need for increased security and data protection and expensive transition costs. Therefore, the current study may influence cloud-computing providers or companies to re-consider the current cloud-computing packages and improve them in such a way that would create a more positive experience for the customers. The cloud-computing providers could provide information on transition costs and create strategies that would warrant the peace of mind and ease of use for the consumers. The results of the current study could also motivate SME owners to seek other methods that could support the advancement and innovation of cloud-computing technology. This is in line with the significant contribution of SMEs to their local communities as well as the economy of the country in general. Given these targeted findings, cloud-computing providers and SME owners will both benefit. The cloud-

computing providers could develop more targeted packages that adhere to the needs and capacities of SMEs. Specifically, there could be packages created to accommodate the business size, capacity, and requirements of SMEs. The SME owners and managers would then have the opportunity to access the software packages which they previously found to be challenging, impractical, and prone to security risks. The results of the study, if and when accessed by the cloud-computing providers, could provide them with significant information or knowledge on the concerns of business owners regarding cloud computing. By accessing the perceptions of the SME owners, cloud-computing companies and their leaders could closely listen to the concerns and work to address them in the future.

The current study could also assist in reducing the resistance of present and future SME owners and managers concerning the adoption of cloud computing by promoting the need for more awareness, education, and training on cloud computing. For Celaya (2015), Ferry et al. (2015), Lacity and Reynolds (2014), company stakeholders must take the time and effort to gain adequate IT skills which they can use as they transition to cloud computing. With the study's framework by Watson (1973), the resistance of the individuals could be neutralized. Watson suggested for change agents to consider reducing the stressors of the individuals by offering training programs and educating the individuals on how they could successfully adapt to the environment and accommodate the suggested changes. Furthermore, with a steady flow of relevant information, especially on the safety and security in using cloud computing in businesses and the cost-

effectiveness of the practice, SME managers and owners may develop more positive perceptions on cloud computing. The results of this study could lead to positive social change by highlighting factors that influence SME managers' decisions regarding cloud computing. Such an understanding could lead to an increased SME cloud-computing adoption. With the implementation of cloud computing and the potential positive changes and improvement that cloud computing could bring to the SME industry, both the future of cloud computing and SMEs are expected to grow.

For the study implications, SME owner's access to and knowledge of cloud computing will allow them to enjoy efficiency and flexibility in their business processes. As a result, SMEs will be empowered by business owners, ones who will be well-equipped and capable of competing even with the large enterprises in their industry. Correct understanding, application, and management of cloud computing in businesses could help owners sustain and even expand their businesses. Cloud computing could provide many benefits, and SME owners could only realize and maximize them once they find the willingness to explore the many opportunities that cloud computing may deliver. Hence, the SME community will continue to grow and improve, helping not only the small communities but the economy of the whole country as they go forward with their contributions and innovations.

### **Conclusions**

In conclusion, the current study reveals there are still relevant concerns that scholars and researchers must address to appease the minds of the SME owners; and

guarantee them that cloud computing is a viable option for their businesses. The current research study provided a better understanding of the perceptions and experiences that influence SME managers' decisions to adopt or not to adopt cloud-computing technology. The results of the current study are critical in finding effective methods and strategies to mitigate and eliminate issues such as privacy and security concerns, promoting the use of cloud computing to other and larger SME groups in the future.

Cloud computing is the way of the future and has definite benefits for the user.

Understanding the experiences of SME managers with cloud computing, as well as their hesitancy to use it can have a positive effect on addressing those concerns and improving the experience. With the proper education on cloud computing, SME managers can have access to more reliable information and be equipped with the skills which they can use to maximize the potential benefits of cloud computing. By doing so, SMEs would have a brighter future ahead, empowering them to stay competitive and at par with the larger corporations who are believed to maximize the benefits of cloud computing.

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## Appendix A: Interview Questions

The interview structure will include two initial thoughts questions and three business related thought questions. This information is disclosed below.

### **Initial Thoughts**

1. What led to your decision to use or refrain from using cloud computing in your business? Can you provide information about all the variables that affected your decision?
2. What is your experience about using cloud computing in business?

### **Business-related Thoughts**

1. Based on your experiences, what do you believe are the pros of using cloud computing in business?
2. Based on your experiences, what do you believe are the cons of using cloud computing in business?
3. Based on your experiences, what do you believe is needed to make more SMEs feel comfortable using cloud computing in their businesses?



## Appendix B: Demographic Questions

Following the interview, participants will be asked to provide demographic information about themselves. They will be provided a sheet of paper with questions and answers, structured as multiple-choice questions. Participants will be asked to select the information that pertains most to them.

1. What is your gender?
  - a. Male
  - b. Female
  - c. I do not wish to answer
  
2. What is your age group?
  - a. 18-25
  - b. 26-35
  - c. 36-45
  - d. 46-55
  - e. 56+
  
3. What is your race?
  - a. Caucasian
  - b. African American
  - c. Asian
  - d. Middle Eastern
  - e. Pacific Islander
  - f. Hispanic
  - g. Multiracial
  
4. What is your level of education?
  - a. High school
  - b. Associate's degree
  - c. Bachelor's degree
  - d. Master's degree
  - e. Doctoral degree
  - f. Specified certificate
  - g. Other
  
5. How long has your company been in business?
  - a. Less than one year
  - b. One to five years
  - c. Six to 10 years
  - d. 11+ years

6. Have you ever used cloud computing?
  - a. Yes
  - b. No
  
7. If you answered “yes” to the previous question, how many years of experience do you have using cloud computing?
  - a. Less than one year (0-1)
  - b. One to three years (1-3)
  - c. Three to five years (3-5)
  - d. More than five years (5+)