2020

Cloud Adoption Decision-making Processes by Small Businesses: A Multiple Case Study

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Walden University
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Abstract

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MS, University Maryland University College, 2007

BA, University of Ghana, 1996

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Management

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Abstract

Cloud services have emerged as a compelling technology with immense benefits, but many companies still have concerns about cloud services adoption because of several failures that have occurred, including mistakes by service providers, exploitation of security flaws by hackers, and immature policies and procedures. The specific problem is how small businesses often lack the understanding of the ramifications of their respective decision-making processes to adopt cloud services. There is little understanding of the decision-making processes managers use in cloud services adoption. The purpose of this qualitative multiple case study was to explore the decision-making processes of 3 small businesses in information technology, legal, and healthcare industries and 3 cloud service providers with a total of 12 participants. The primary question explored the decision-making factors that contribute to the success of companies adopting cloud services. The conceptual framework was based on Mintzberg et al.'s strategic decision-making model, which consists of problem identification, solution development, and selection. Data for the study were collected through semi structured interviews and were analyzed using cross-case analysis. Five prominent themes that emerged were cost savings, cloud information security, competitive advantage, skills availability, and reliability. This research uncovered important factors in the decision-making process, including lack of training and a formal cloud adoption framework. This research may influence positive social change by deepening small businesses' understanding of essential factors in the decision to successfully adopting cloud services.

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Dedication

This dissertation is dedicated to the memory of my parents Faustina Dufie Blay, and Philip K. A. Blay, whose love, upbringing, and support made me who I am today and also to the memory of the venerable Justice R.S. Blay my grandfather. I also want to express my sincere appreciation to my beloved and beautiful wife, Akosua Amoakoaa Blay, for her gracious support and patience throughout the program. Her unwavering belief in me pushed me on in this and so many other areas in my life, and I am very grateful. I also dedicate this to my handsome and beloved sons Francis Hamilton Blay and Augustine Wusu Blay, who put up with the many times I could not play with them because I had to go to the library.

To my precious siblings Dina, Augustine, Elizabeth, Faustina, Philomena, Marthe, Bernard, and Christopher, I say I love you all very much to the entire Blay clan in Ghana, United States and all other parts of the world. I also to acknowledge my brother Kwasi Blay for his support throughout my high school and college education in Ghana as well as the entire Wusu-Ansah family at Tesano, especially my father-in-law Osei Wusu-Ansah and mother-in-law Paulina Wusu-Ansah.

Acknowledgments

First of all, I would like to thank the Lord Jesus Christ for helping me through this program and giving me the courage not to give up. I would like to acknowledge all the saints at my beloved church Message Tabernacle in Washington, D.C., and my beloved pastor, best friend and brother Augustine Blay, whose wise counsel and guidance have been invaluable.

I cannot overstate the outstanding guidance and support of Dr. Karla Phlypo to get me back on track to complete this dissertation. I could not have done it without her. I also want to express my most profound appreciation and gratitude to Dr. Forbes, Dr. David Gould, and Dr. Lisa Barrow for the spectacular work they did to help me through this dissertation.

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Chapter 1: Introduction to the Study

Cloud services enable companies of all sizes to attain their business objectives (Aljabre, 2012; Dhar, 2012). Although cloud services have many benefits, including cost reduction and quick delivery to market (Hobman & Walker, 2015; Yang, Yan, & Nebert, 2013), they have resulted in spectacular failures, including mistakes by service providers, exploitation of security flaws by hackers, and immature policies and procedures (Froehlich, 2015; Rong, Nguyen, & Jaatun, 2013). Managers who decide to adopt cloud services must understand the full ramifications of the decision and its attendant risks and not just leave it to the cloud provider. The burden is on the user to understand the risks associated with cloud adoption instead of accepting the promise of cloud services at face value (Alsanea & Barth, 2014; Ross & Blumenstein, 2013). An effective management decision process that considers all potential risks and plans for them can create a successful outcome (Elena & Johnson, 2015). Chapter 1 covers the background, problem statement, purpose of the study, research questions, and significance of the study (Kshetri, 2013). The chapter includes the research questions and key terms in this study. This chapter also covers an overview of the conceptual framework and methodologies for this qualitative study.

Background of the Study

Researchers need to address gaps in areas regarding management understanding of infrastructure security best practices in software development and simplifying their installations and configurations when it comes to cloud services (Payne, 2014; Vaquero, Rodero-Merino, & Morán, 2011). Cloud services solutions vary but could be a cloud-

hosted application, cloud storage, platform services such as databases and middleware applications, or infrastructure resources such as servers in the cloud. Cloud services users often do not have a full understanding of the ramifications of using the cloud because they lack the expertise and experience (Kshetri, 2013).

The benefits of cloud services are often well understood and advertised. Cloud services fill the void for affordable and reliable technology, but they not a good fit for all businesses. Depending on how companies adapt, cloud services may speed up time to market targets and enhance their competitive advantage (Aljabre, 2012). The value proposition for cloud services is improving efficiencies internally by helping organizations focus on their core competencies and enhancing their business productivity. The cost savings and the optimum use of resources are compelling benefits (Shi, 2013).

To effectively identify and mitigate the risks, management must use a decision-making model to perform a cost-benefit analysis because the cost is the central determinant for decision-making in cloud services (Alsanea & Barth, 2014). One such framework is a mathematical model for the calculation of the total cost of ownership of cloud services to decide whether outsourcing into the cloud is financially attractive or not (Walterbusch, Martens, & Teuteberg, 2013). A critical consideration for cloud services is to ensure that the specific requirements of a business's applications can be satisfied by the cloud providers (Rehman, Hussain, & Hussain, 2014). Cloud services users must use a quality of service history model in selecting the appropriate cloud services provider (Rehman, Hussain, & Hussain). Numerous suggestions from various stakeholders regarding crucial considerations for cloud services can make the issue complex. A

proliferation of theories and fragmented approaches limit the understanding of the ramifications of cloud services (Ray, 2016).

Organizations often focus on the inherent benefits of cloud services without considering discipline, procedural, and operational factors, which has led to disasters (Lawler, Joseph, & Howell-Barber, 2012). Adopting cloud services can also affect staff morale because it can create an atmosphere of job insecurity and affect staff development. The limited literature and research in this area underscores the need for additional research to reduce the gaps (Nkhoma & Dang, 2013; Ross & Blumenstein, 2013). Studies have been done to analyze the differences that exist in cloud services security, and researchers have offered an innovative user behavioral authentication mechanism as a solution to mitigate authentication weaknesses in the cloud to avoid disasters and catastrophic consequences (Dlamini et al., 2016).

A thorough assessment of the ramifications of cloud services must occur before an organization fully embraces it. The decision-making processes should go beyond cost and include business aspects of cloud services, such as sustainability, efficient delivery of services, and strategic competitive advantage. A comprehensive review of the main themes and concepts are essential in cloud services decision-making (Karunakaran, Krishnaswamy, & Sundarraj, 2015).

The divergence between this study and other cloud services studies was the lack of understanding on the part of management regarding the full capabilities and shortcomings of cloud services before deciding to adopt. Cloud services have well-advertised benefits and challenges, but it is essential to understand what drives

management in pursuing cloud services (AbuKhousa, Mohamed, & Al-Jaroodi, 2012). The circumstances of placing intellectual property and confidential data in the hands of another organization with minimal visibility and transparency necessitates a thorough and deliberate decision-making effort.

Most of the earlier studies of cloud services have focused on operational and technical issues, such as virtualization, authentication, and encryption (Alali & Yeh, 2012). Few studies have been conducted to address cloud services from the perspective of the decision-making processes that organizations go through before adopting cloud services (Kshetri, 2013). The literature generally does not address the risks and mitigation strategies associated with the emergence of cloud capabilities, which requires a more in-depth study in emerging technologies affecting accounting and audit practices, especially cloud technologies (Alali & Yeh, 2012).

Problem Statement

Cloud services enable companies of all sizes to achieve their objectives efficiently and cost effectively (Aljabre, 2012; Armbrust et al., 2010; Dhar, 2012). Despite the many benefits, including cost reduction and quick delivery to market, spectacular failures have occurred when companies attempted to embrace cloud services (Kerner, 2016). The failures span multiple domains, including mistakes by service providers, exploitation of security flaws by hackers, and immature policies and procedures (AbuKhousa et al., 2012; Froehlich, 2015).

The failures also vary in size among cloud providers and businesses. Most previous studies of cloud services have focused on operational and technical issues. Few

researchers have sought to address cloud services from the perspective of the decision-making processes that organizations go through before adopting cloud services (Kshetri, 2013).

The general problem highlights that little has been understood about the decision-making processes of managers when they determine whether to implement cloud services (Sinanc & Sagiroglu, 2013). The specific problem is how small businesses often lack the understanding of the ramifications of their respective decision-making processes to adopt cloud services. Turning over data to a third party has significant implications that require a thorough decision-making process by small businesses to fully understand the ramifications and to plan for contingencies and mitigating strategies. There are challenges in meeting the requirements of legislation that regulate data privacy and stricter controls in the public cloud (Alosaimi, Zak, Al-Begain, Alroobaea, & Masud, 2017). These challenges are because of the potential of data dispersal across multiple geographical locations and the loose boundaries around data and who is responsible for it (Ahmad & Janczewski, 2011). Compliance concerns also include the fact that different jurisdictions have different legal requirements (Madi et al., 2016).

Purpose of the Study

The purpose of this qualitative multiple case study was to explore the decision-making processes in cloud adoption of the three small businesses that span three industries: IT, legal, and medical. There is not enough understanding of how management in small businesses makes decisions about adopting cloud services. Leaving proprietary intellectual property and confidential data in the hands of a third party could pose a

problem if appropriate security controls are implemented because of the lack of visibility and transparency regarding the architecture and technology stack that the cloud provider uses. The process of deciding and understanding the ramifications of cloud adoption is essential to avoid any unexpected consequences that might emerge after embracing it.

Research Questions

The overarching research question was: What are the decision-making factors that have contributed to the success of companies adopting cloud services?

Conceptual Framework

The strategic decision process model put forward by Mintzberg, Raisinghani, and Theoret (1976) was the conceptual framework for this research. With this model, Mintzberg et al. asserted that decision-making is a planned activity that requires a thorough assessment of all the variables that go into producing a successful outcome. I explored how management considers the full ramifications of cloud services to avoid unforeseen dire consequences. The decision-making involves understanding risks associated with cloud services and strategic approaches to mitigating those risks. The strategic decision-making model has four variations: (a) managerial autocracy model, (b) systemic bureaucracy model, (c) adaptive planning model, and (d) political expediency (Mintzberg et al., 1976). The differences among the models are in the degree and depth of problem familiarization and solution-building activities (Mintzberg et al., 1976).

All the variations of strategic decision-making share the phases of problem familiarization, solution building, decision implementation, organizational learning, and external influences. I focused on the process of decision-making within the context of

three small businesses to explore decision-making processes to adopt cloud services. The strategic decision-making model was developed from diverse industries, including manufacturing, service, government, and quasi-government agencies, regardless of what the object of the decision-making was. The strategic decision is complex, open-ended, and novel (Mintzberg et al., 1976).

Strategic decisions are either by the stimulus, solution, or the decision itself. In this study, the stimulus is the need for secure cloud services at an affordable cost, lower than internal information technology (IT) services can provide; the solution is the model of cloud services chosen or the process used to make the decision itself. The solution could be nonexistent and has to be developed from scratch or might be ready made or customized to fit the need of the decision maker. The strategic decision process model is the foundation of my conceptual framework, and the key components are identification, development, and selection.

The three high-level phases are underlined by seven main routines: (a) recognition, (b) diagnosis, (c) design, (d) search, (e) screen, (f) evaluation choice, and (g) authorization. The entire decision-making process is dynamic and evolving and continuously affected by internal and external factors, or interrupts (Mintzberg et al., 1976). These interrupts are the factors that often impede or expedite the flow of the decision-making process. The interrupts often vary depending on the industry or the type of organization. I chose to study three small businesses in different sectors to account for the various interrupts and how they affect the decision-making processes to adopt cloud

services. A model of Mintzberg's strategic decision-making process in Figure 1 illustrates the strategic decision-making process.

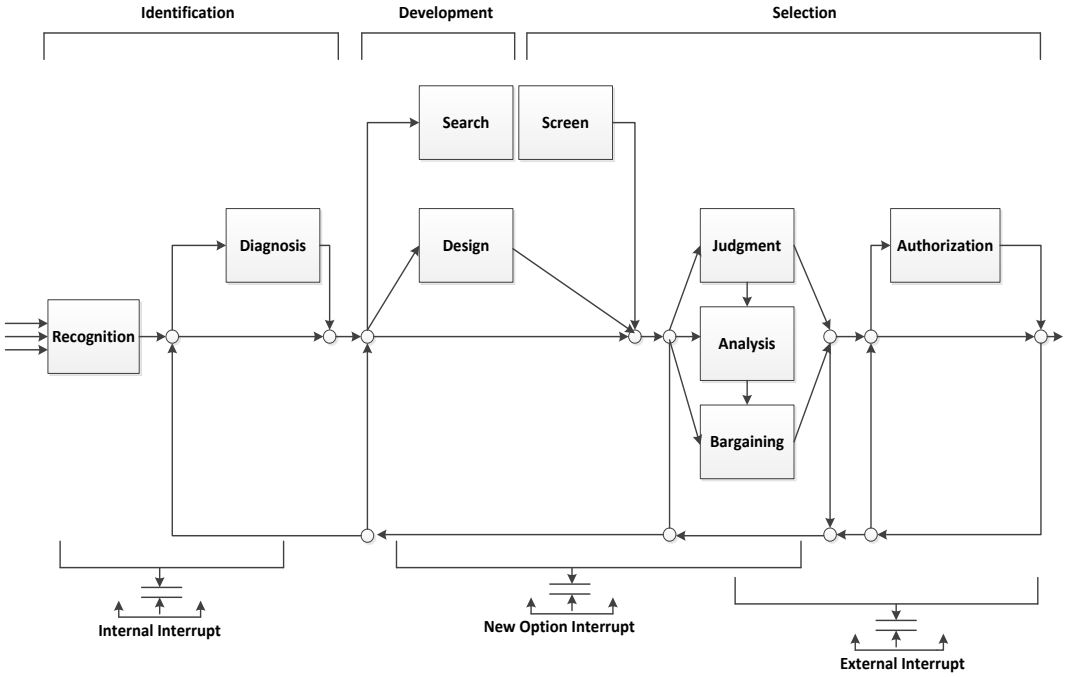

Figure 1. Mintzberg's general model of the strategic decision-making process. Adapted from "The Structure Of Unstructured Decision Processes," by Mintzberg, H., Raisinghani, D., & Theoret, A. 1976., *Administrative Science Quarterly, 21*(2), 246-276. doi: 10.2307/2392045. Reprinted with permission. See Appendix D.

The most critical phase of Mintzberg's strategic decision-making process is the diagnosis, which involves taking the time to thoroughly understand the stimulus for the decision before embarking on a search for solutions. In this case, the stimulus is the need for secure and affordable computing services. Even though the diagnosis is essential, it does not often receive enough attention from researchers (Mintzberg et al., 1976). I focused on exploring all the strategic decision-making processes pursued by management and the interrupts that affect decision-making. The identification phase starts when management recognizes the benefits of cloud services and considers implementing these services. Diagnosis involves seeking to understand the concepts of cloud services and all

the determinants for successful adoption, including the risks. The development phase consists of the consideration of the various cloud models and deployment options by searching for alternatives and screening them at a high level for feasible and ideal options. The selection process involves further analysis and bargaining to come to the final choice and authorize the implementation. The three core components of the strategic decision-making process in my conceptual framework are recognition, development, and selection. The interrupts are in the internal and external factors that affect decision-making.

The recognition stage involves establishing a clear understanding of the benefits of cloud services, as well as the disadvantages, and aligns it with the business strategy. The business problem that it seeks to solve must be identified and understood. Effective mitigation strategies must be developed for each of the identified issues for a feasibility assessment. The development component is selecting the most feasible option, keeping in mind the capacity of the company to absorb the cost and any accompanying risks that come with the chosen model. The last stage is execution of the preferred model for successful cloud services adoption.

Nature of the Study

The nature of the study is qualitative. The design method is a multiple case study, which applies to many disciplines (Patton, 2002; Vissak, 2010; Yin, 2014). The rationale for my choice was that for an in-depth understanding of how management decides on cloud adoption, I needed to employ a triangulation of methods, including a literature review and interviews with managers across multiple sources. Each case was a small

business that has decided to adopt cloud services in its industry. A case study is appropriate in the context of specific research scenarios where the questions of why and how are prominent in studying complex phenomena and incremental processes (Vissak, 2010).

Having a detailed understanding of the complex ramifications helps formulate a practical mitigating strategy for cloud adopters. The three organizations in this study consisted of a legal firm in Maryland, a private medical practice, and an IT company. I interviewed two management executives from each of the organizations as well as two executives from the cloud providers that each organization uses to assess their perspectives as industry experts on what constitutes the essential ramifications of cloud services adoption.

Definitions

Cloud services: Technology that allows organizations to run applications in a third-party location through the Internet without any investment in technology on premise (Cloud Security Alliance, 2013).

Elastic computing: Technology that enables cloud users the ability to increase the utilization of demand without any delays (Cloud Security Alliance, 2013).

Emergent strategy: The final adopted strategy at the organizational level resulting from a set of collaborative processes, initiatives, and activities at the subcommunity level within an organization (Henfridsson & Lind, 2014).

Hybrid cloud: A combination of private and public cloud deployment models; some aspects of the technology are on premise, and a third party hosts some of the computing needs of the organization (Cloud Security Alliance, 2013).

Infrastructure as a service: The cloud model that provides organizations the ability to have servers in the cloud for the installation and configuration of software and applications (Cloud Security Alliance, 2013).

Microstrategizing: The process of breaking decision-making into processes at the subcommunity level for inputs to formulate the broader organizational strategy (Henfridsson & Lind, 2014).

Platform as a service: The model that enables organizations not to have to obtain servers in the cloud but rather to use applications. The end user configures the application for use (Cloud Security Alliance, 2013).

Private cloud: Technologies that enable elastic computing, on demand, and automated deployments, as well as metered use, within the premises of the organization instead of having a third-party provider (Cloud Security Alliance, 2013).

Public cloud: Offloading all the computing needs to a third-party entity and using the service without any footprint of the technology on premise (Cloud Security Alliance, 2013).

Resource pooling: Combining all available resources to be centralized in a pool to avoid resource waste and to maximize optimum use of resources (Cloud Security Alliance, 2013).

Software as a service: The cloud user subscribes to the service without any investment in the servers, application, or software except to pay and use the software (Cloud Security Alliance, 2013).

Virtualization: The foundation technology for cloud services that enables several computers to exist on a single or combined set of hosts (Cloud Security Alliance, 2013).

Assumptions

Researching a relatively new phenomenon has its challenges because certain things, such as the depth and truthfulness of the respondents, are beyond my control. For the research to be relevant, I must state my assumptions. In research, an assumption is a limitation the researcher cannot deliberately control but assumed to be true (Yin, 2014). According to Leedy and Ormrod (2010), a research problem is not in itself possible without an assumption. For my research, I make certain assumptions that are not readily verifiable by me, but I must state them to make my research relevant.

Assumptions include the fact that small business owners and managers may lack a formal decision-making framework for cloud adoption. Alternatively, the decision-making process used may be incomplete for the complexity and risk of considering adopting cloud services. The lack of a formal decision-making framework often leads to unanticipated consequences.

Organizations do not always see the benefits because of the selection of a cloud deployment model that does not fit the profile of the organization. Decision-makers often rely on the hype of the benefits and do not take the time to do the proper analysis. I assumed the decision-makers were truthful in providing me the accurate and truthful

responses to my questions during interviews necessary for the reliability of my research (Patton, 2002). I consulted with available public documentation on the cloud adoption framework of the cloud providers. Relying on documentation in addition to interviews allowed for data triangulation (Baskarada, 2014; Kern, 2016).

Scope and Delimitations

The scope of this research was on decision-making processes and strategies by three small businesses. The decision-making processes of managers when they determine whether to implement a cloud services solution are not often understood (Sinanc & Sagiroglu, 2013). In small businesses in the health, legal, and IT industries, leaders often lack the full understanding of the ramifications of their respective decision-making processes to adopt cloud services. I focused on three companies based in the United States in the health, legal, and IT industries. The three companies from three distinctly different sectors provided a varied perspective in the decision-making process. The three companies were all in the same metropolitan area.

The discussion on the benefits of cloud services and the risks associated with the adoption was within the context of how they relate to the decision-making process. The research boundary covers the processes and activities and not the technical implementation details. I only interviewed executive management and senior technical staff involved in the cloud adoption decision-making process. I interviewed management personnel from three cloud providers to obtain their perspectives on the key considerations for cloud services adoption. A variation could emerge from the cloud provider perspective that could provide deeper insight. The findings of this study may

apply to other industries because the focus is on placing data in the hands of a third party, which can apply to any organization that adopts cloud services.

I interviewed at least two leaders in each of the small businesses directly involved in strategic decision-making and two executives from cloud provider companies. The technical staff who were not involved in the decision-making process were not part of the interviews.

Literature exists on cloud technical implementation as it relates to authentication mechanisms, encryption, service model implementations, and architecture (Lawler et al., 2012). Technical implementation strategies and theories were not part of the scope of this research. The scope was only on the decision-making processes and framework by management to address the specific research problem.

This study does not cover the actual acquisition process and contractual negotiations but only the decision-making that ends at the inception of actual deployment and execution of the chosen strategy. Technical simulators and tools (Ross & Blumenstein, 2013) that provide infrastructure and technical assessment are not part of the decision-making process. Security and privacy concerns are prevalent in any cloud services discussion (Sandhu et al., 2010; Sinanc & Sagiroglu, 2013; Yang & Tate, 2012), and they were relevant to the extent that security considerations were part of decision-making but they were not a comprehensive are of study in this research.

Limitations

A qualitative case study was best suited for this research because qualitative research is used to address *how* and *why* questions (Yin, 2014). A case study has several

limitations, and any confusion in the purpose and implementation of the method can have negative consequences (Baskarada, 2014). A case study provides a rich and in-depth perspective on the subject. The limitation of my study was access to accurate and detailed information to make the study credible. To overcome that, I employed triangulation of sources and methods of data collection. I interviewed two executives from three distinct cloud services user companies and three cloud services providers. I looked beyond the interviews by also reviewing publicly available information to ensure consistency. Interviews and literature reviews from the sources spanned 3 months to ensure saturation of the data.

Another limitation was adequate preparation to understand better the subject matter of cloud services and strategic decision-making. My competence in the subject matter is 20 years of experience in the IT industry and several certifications in cloud services, which have provided me the credibility for research quality and reliability (Patton, 2002). Triangulation of sources and methods to corroborate research findings demonstrate the quality of the study. I disseminated the draft report for the respondents to review for accuracy (Patton, 2002; Yin, 2014).

I clarified my bias from the outset of the research to show understanding of the subject matter and to make conclusions taking into consideration my worldview and perspective. I remained neutral throughout the interviewing process and did not act in any way to affect the respondents' perspectives. I avoided leading questions and did not reveal my position on the subject. Using multiple cases is another method to demonstrate research validity (Yin, 2014).

As this was a qualitative study with few participants in a single geographical area, the study is not transferable. Contrary or contradictory cases enhance the credibility of research without any interpretations (Reynolds et al., 2011). A potential barrier was gaining access to financial data and IT security challenges that the organizations may be facing, in addition to other non-cost factors where access to business data was unavailable. Gaining access to executive management in all the organizations was complicated, but extensive experience in the industry provided me access to executive management among the cloud providers.

Management of most of the small businesses had difficulty understanding the concepts of cloud services as the factors for decision-making were technical. That in itself provided a perspective in the decision-making process regarding how the lack of understanding affects the decision. The availability of management for interviews also proved difficult, but I provided different time slots to make it easier for them to offer me access to the meeting appointments. Specific technical implementations that were specific to each organization or industry were discussed but not as a generic framework for cloud adoption decision-making.

Having practical experience in the field posed a challenge of me inserting myself into the data gathering instead of listening and recording. I overcame this by using tape recorders and taking detailed and copious notes that were validated by the participants to assure readers of neutrality. I captured responses verbatim and avoided leading questions that could have skewed responses.

Significance of the Study

Several models for cloud adoption provide theoretical frameworks for organizations, but they are often challenging to implement in theory because of the difficulty balancing the advertised benefits with the costs of security threat mitigation (Rong et al., 2013; Sinanc & Sagiroglu, 2013). Research in cloud adoption decision-making is paramount (Sandhu et al., 2010). According to Cloud Security Alliance (2013), the top two threats of cloud services are insecure application programming interfaces, which constitute 29% of all threats, and data loss or leakage, which represents 25%. Beyond security threats are many operational, financial, legal, compliance, and other pertinent factors that need to be considered and fully understood by management (Cloud Security Alliance, 2013; Rahimli, 2013; Sandhu et al., 2010; Yang & Tate, 2012).

This research may contribute to an emerging field of study in cloud services and the preconditions for successful cloud adoption. The process of decision-making permeates the entire spectrum of cloud services deployment, whether public, private, or hybrid. The challenges also exist in all cloud services models: infrastructure as a service, platform as a service, and software as a service. Small and startup companies may benefit from the decision-making framework because they invariably do not have the scale of internal infrastructure investment, which makes cloud services more compelling (Walterbusch et al., 2013). The findings of this research may contribute to the cloud services literature by exploring the ramifications in the decision-making process for cloud adoption by cloud users and for cloud providers who seek to understand the needs of management. Positive social change may result in enhancing the success rate of cloud

services adoption even though it could decrease the adoption rate by organizations for which the cloud may be inappropriate and to prevent breaches, outages, negative financial impact, legal and compliance issues among many other ramifications that negatively affect organizations and their customers.

Summary and Transition

Cloud services have many benefits, including cost reduction and quick delivery to market (Aljabre, 2012; Armbrust et al., 2010; Dhar, 2012), but cloud services implementation has also resulted in failures. Such failures include security breaches, an outage to the business, a lack of high availability options, and immature policies and procedures (Froehlich, 2015). These failures can result from problems associated with cloud services not fully understood at the time of deciding to adopt cloud services. A few studies exist to address cloud services from the perspective of the decision-making processes that organizations go through before selecting cloud services (Kshetri, 2013). Little is understood about the decision-making processes of managers when determining whether to implement a cloud services solution (Sinanc & Sagiroglu, 2013).

Chapter 1 covered the background, the purpose of the study, the research questions, the significance of the study, and the gap in research regarding cloud decision-making. The chapter included the research questions, key terms in this research study, the overview of the conceptual framework, and methodologies for this qualitative study. The purpose of this qualitative multiple case study was to explore the decision-making processes in cloud adoption by three small businesses that span three industries: IT, legal, and health. To obtain a better understanding of the concepts of strategic decision-making

related to cloud services by small businesses, Chapter 2 includes a comprehensive literature review of contemporary literature that explains the key concepts. Chapter 2 consists of a literature search strategy, the conceptual framework that forms the foundation for the study, a comprehensive review of contemporary peer-reviewed articles on cloud services concepts and strategic decision-making of cloud services, and an overall analysis of the articles.

Chapter 2: Literature Review

Cloud services provide many benefits to businesses (Hobman & Walker, 2015; Yang et al., 2013); but this sophisticated technology must be well understood before a business decides to embrace it (Fazlollahtabar & Saidi-Mehrabad, 2015; Kshetri, 2013). Small companies often do not have a transparent process in the decision to adopt complex strategic technology such as cloud services (Henfridsson, & Bygstad, 2013). The specific problem is that small businesses often lack the full understanding of the ramifications of their respective decision-making processes to adopt cloud services. The purpose of this qualitative multiple case study was to explore the decision-making processes in cloud adoption by three small businesses that span three industries: IT, legal, and health.

Literature Search Strategy

The purpose of this literature review was to assess the benefits that drive organizations to embrace cloud services, the risks associated with adoption, and the decision-making strategy that businesses employ before selecting the appropriate deployment or service model for cloud services. I used multiple library databases and the Google search engine for the literature review. The databases included ProQuest, Google Scholar, Academic Search Complete, EBSCOhost, ACM Digital Library, CrossRef, IEEE Xplore, Sage Journals, Science Direct, Business Source, Complete, LexisNexis Academic, and books on cloud services. The literature review was on the most recent and relevant peer-reviewed articles accompanied by more specific key search terms. Most of the articles came from the EBSCOhost database with the primary key search terms of *cloud services decision-making*. Many of the articles that were not directly relevant to the

decision-making process were discarded. Once articles on decision-making were exhausted, the cloud services framework search term was used to expand the literature search on the topic. Additional literature came from a combination of crucial search terms that highlight decision-making and strategic choices for cloud services. I used keywords like *cloud services framework, strategic decision-making, cloud decision-making, cloud strategy, cloud services adoption framework, cloud adoption strategy, cloud decision-making matrix, decision-making matrix for cloud services, cloud services, and cloud strategy, strategic cloud framework, cloud services approach, cloud framework,* and *cloud adoption framework*. Of 293 articles found, 252 were directly relevant to the research problem and were used in this literature review. Those eliminated from the literature review were focused on purely technical implementations and jargon with little management relevance.

Conceptual Framework

A strategic decision-making model was the basis for the conceptual framework for this research (Mintzberg et al., 1976). Mintzberg et al.'s model asserts that decision-making is a planned activity that requires a thorough assessment of all the factors that go into producing a successful outcome. In this case study, I explored how management considers the full ramifications of cloud services to avoid unforeseen dire consequences. Strategic decision-making is what differentiates a company from the competition (Li & Sujirapinyokul, 2010). Decision-making includes understanding the problem that cloud services solve and alternatives that exist to address it. The focus was on the process of

decision-making within the context of three small businesses to explore their decision-making processes for cloud services adoption.

Management has often rushed to adopt cloud services because of the advertised benefits (Kim & Kim, 2016) without due diligence and thorough assessments of the ramifications before choosing the appropriate service or deployment model (Armbrust et al., 2010; Wang, Sun, & Chen, 2014). A full grasp of the risks and potential negative consequences of cloud adoption is critical to identify effective mitigating strategies before proceeding to select a solution for implementation (Sohaib & Naderpour, 2017). This theory was directly relevant to my study because not only does it provide a clear roadmap for decision-making, it also identifies external factors, organizational readiness, and management support as critical aspects of the decision-making process (Sohaid & Naderpour).

External factors consist of the legislative and regulatory environment, competition, readiness of the cloud provider, and the economy—all which affect the choice of the cloud services and deployment model. Organizational learning is the conditioning of employees to accept and support cloud services. If the necessary framework exists to train and equip the employees with the requisite skills to embrace cloud services, it is more likely to succeed. However, if employees lack the appropriate forum to either learn or express themselves, limited buy-in can occur.

The strategic decision-making model, as put forward by Mintzberg et al. (1976), asserted that decision-making requires a thorough assessment of all variables that go into producing a successful outcome. I explored how management considers the full

ramifications of cloud services to avoid unforeseen dire consequences. The decision-making process includes understanding risks associated with cloud services and the strategic approach to mitigating them. The four variations of the strategic decision-making model are the (a) managerial autocracy model, (b) systemic bureaucracy model, (c) adaptive planning model, and (d) political expediency. The differences among these models are in the degree and depth of problem familiarization and solution building activities (Mintzberg et al., 1976).

All the variations of strategic decision-making share the phases of problem familiarization, solution building, decision implementation, organizational learning, and external influences. In this study, I focused on the process of decision-making within the context of three small businesses to explore decision-making processes to adopt cloud services. The strategic decision-making model was developed from diverse industries, including manufacturing, service, government, and quasi-government agencies, regardless of what the object of the decision-making was. The strategic decision is often complex, open-ended, and novel (Mintzberg et al., 1976).

Strategic decisions can be categorized by the stimuli, solution, or the decision itself. In this study, the stimulus is cloud services; the solution is the model of cloud services chosen or the process used to make the decision itself. The solution could be nonexistent and has to be developed from scratch or ready-made or customized to fit the need of the decision-maker. The foundation for my conceptual framework is strategic decision-making, and the core components are identification, development, and selection.

The three high-level phases have seven main underlying routines: (a) recognition, (b) diagnosis, (c) design, (d) search, (e) screen, (f) evaluation choice, and (g) authorization. The entire decision-making process is dynamic and evolving and continuously affected by internal and external interrupts. These interrupts are factors that impede or expedite the flow of the decision-making process. The interrupts often vary depending on the industry or the type of organization. Using three small businesses in different industries in this research accounts for the various interrupts and how they affect the decision-making processes to adopt cloud services.

The most critical phase of strategic decision-making is a diagnosis, which involves taking the time to thoroughly understand the trigger for the decision before embarking on a search for the solutions. In this case, the trigger is cloud services. Even though the diagnosis is essential, it does not often receive enough attention from researchers (Mintzberg et al., 1976). I focused on exploring all the strategic decision-making processes pursued by managers and the interrupts that affect decision-making. The recognition phase starts when management recognizes the benefits of cloud services and begins considering it. Diagnosis involves seeking to understand the concepts of cloud services and all the determinants for successful adoption, including the risks. The development phase covers the consideration of the various cloud models and deployment options by searching for alternatives and screening them at a high level for feasible and ideal options. The selection process involves further analysis and bargaining to come to the final choice and authorize the implementation. The three core components of the strategic decision-making process in my conceptual framework are recognition,

development, and selection. The interrupts are in the internal and external factors that affect decision-making.

The recognition stage involves establishing a clear understanding of the benefits of cloud services as well as the disadvantages and align them with business strategy. The business problem that it seeks to solve must be spelled out and understood. Following the articulations of the issues was the development of effective mitigation strategies for a feasibility assessment. The development component was to select the most feasible option keeping in mind the capacity of the company to absorb the cost and any accompanying risks that come with the chosen model. The last stage was to exclude the preferred model for successful cloud service adoption. The Mintzberg strategic decision-making model was used in formulating an understanding of strategic decision-making for information systems (Henfridsson, & Lind, 2014), as shown in Figure 3.

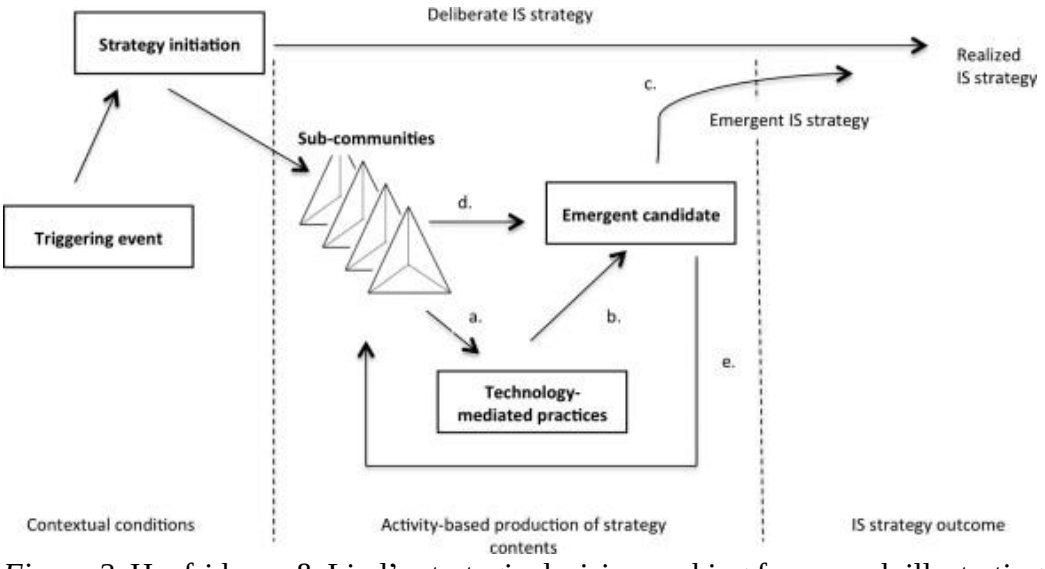

Figure 2. Henfridsson & Lind's strategic decision-making framework illustrating the strategic decision-making process. Adapted from "Information systems strategizing, organizational sub-communities, and the emergence of a sustainability strategy," by Henfridsson, O., & Lind, M. 2014, *Journal of Strategic Information Systems, 23*(1), 11-28. Reprinted with permission. See Appendix E.

The strategic decision-making processes start with a trigger that might be reactive or prospective, but it leads to the formation of subcommittees who study the ramifications and the depth of the issues surrounding the specific information system trend. The activities of the subcommittees often result in the emergence of a strategic direction (Henfridsson, & Lind, 2014). I used the strategic decision-making model of Mintzberg as the conceptual framework for this study, which aligned with the steps that management goes through to formulate a strategic decision (Henfridsson, & Lind, 2014).

Deliberate planning is a critical part of management in formulating strategic directions. The proliferation of information system infrastructures throughout organizations has created a platform for decentralized decision-making of an organization (Henfridsson, & Lind, 2014). Organizations have to break down the strategic decision-making process into micro-processes and practices that spread throughout the organization to align with business interests in forming long-term strategic goals. In the modern world, flexibility and agility are essential in strategic initiatives, and it is a continuous process (which needs detailed feedback and direct contact with the customer hence devolving the strategic decision-making into practices away from central management but making it a broad-based activity ensures proper alignment with customer expectations.

A case study of European automaker, AutoInc, in implementing a strategic direction to meet regulatory, and customer expectations used a variety of sub-communities and actors within an organization as part of the micro-strategizing process using information systems to implement a sustainability strategy (Henfridsson & Lind,

2014). The study looked at how diverse perspectives from the sub-communities ultimately shaped the decision-making process to achieve the information systems strategy. The conceptual framework of their research was Mintzberg's seminal strategy categories. Mintzberg's strategic decision framework is a combination of emergent and deliberate actions. Strategic decision-making practice components are sub-community, organizational community, new information systems strategy, and information system strategizing (Henfridsson, & Lind, 2014). The sub-communities look at how information systems can help them achieve their goals, which in turn affects the entire organizational community to shape the strategic choices of information systems. The case study data collection was through semi-structured interviews, participant observation, and archival data to explore the new strategic choices through sub-communities. In their study, technologies that were targeted at local sub-communities such as powertrain, infotainment, and active safety all eventually resulted in the emergence of a sustainability strategy at the organizational level of green, safe, and connected (GSC). Though senior management created a context, the details were left open-ended to allow for collaborative input from various stakeholders and sub-communities, which eventually became a transformative technological, strategic direction. All the multiple contributions of the sub-communities informed the technology design choices (Henfridsson, & Lind, 2014).

In using the Mintzberg's strategic decision-making model, the starting point is setting the broad contextual goal, and using input from various sub-communities as inputs for evaluation before a final choice. Taking inputs, evaluating them before making

a final decision aligns with the conceptual framework of Mintzberg's strategic decision model, which involves the broad categories of identification, development, and selection.

For decision-making in cloud services, the trigger point is the need to improve efficiency and cost, and the decision-making process involves looking within for the internal pre-conditions and various stakeholder perspectives to develop options out of which a final strategic direction emerged for the appropriate cloud services service and deployment model.

Literature Review

The purpose of this qualitative multi-case study was to explore the decision-making processes in cloud adoption by three small businesses that span three industries: IT, legal, and health. This literature review focused on the general topic of cloud services and the benefits, the risks, the key considerations in cloud services and what decision-making process is used in cloud adoption to inform the audience of the developments in the field and to set the situate the study in the past research context.

Definition of Cloud

The definition of cloud services had been diverse (Keshavarzi, Haghighat, & Bohlouli, 2017; Lehrig, Eikerling, & Becker, 2015). A simplified description is the technology that enables users to access IT service over the internet with little knowledge and visibility into how it works. This definition does not cover the essential characteristics of cloud services (Kenealy, 2012). The widely adopted definition of cloud services is put forward by the National Institute of Science and Technology (Alali, & Yeh, 2012; Mell & Grance, 2011). Their widely accepted definition focused on the

characteristics of cloud services (Al-Musawi, Al-Badi, & Ali, 2015; Meadows, 2011) The critical attributes of cloud services include broad network access, rapid elasticity, measured service, on-demand self-service, and resource pooling (Mell, & Grance, 2011; Wang et al., 2014).

The characteristics of cloud services come together to provide a framework for flexible and elastic computing as a definition of cloud services (Albakri, Shanmugam, Samy, Idris, & Ahmed, 2014). Without a clear understanding of what cloud services is, it is difficult to establish why an organization may want to adopt it because of the complex mix of benefits and challenges (Al-Ruithe, Benkhelifa, & Hameed, 2016; Bounagui, Hafiddi, & Mezrioui, 2016; Henderson, 2013). The core tenets of cloud services must first be well understood before any effort to adopt it (Lehrig et al., 2015). Besides understanding what cloud services means, it is also essential to understand the deployment and service models (Ross & Blumenstein, 2013).

The definition of NIST according to Mell and Grance (2011), offers that cloud services can either be at the infrastructure level (virtual machines, networking, storage, and other physical artifacts) which is referred to as infrastructure as a service (Alkhalil, Sahandi, & John, 2017; Kenealy, 2012) or at the application programming platform level referred to as the platform-as-a-service (Henderson, 2013; Kenealy, 2012) or software-as-a-service (Lehrig et al., 2015; Ross, & Blumenstein, 2013). An organization can benefit from all the different service models, depending on their needs (Lehrig et al.).

The last component of the definition is the deployment model, which principally focuses on the location of the cloud services facility (Mell, & Grance, 2011; Reixa,

Costa, & Aparicio, 2012; Ross, & Blumenstein, 2013). The deployment can be private if the infrastructure is hosted on premises or public and wholly owned and operated by an external organization or a hybrid. Big public cloud providers include Amazon, Google, IBM, Yahoo, eBay, and Microsoft (Aljabre, 2012). Each of the providers offers different functions within their cloud services service (Ross & Blumenstein).

Benefits of Cloud services

The broad adoption and commercialization of internet usage have enabled organizations to reach markets that were previously beyond reach (Chihande, & Van der Poll, 2017; Mell, & Grance, 2011). Cloud services are made possible because of the broad adoption of internet usage (Mell, & Grance, 2011). The cloud services industry is projected to grow from $40.7 billion in 2011 to $159.3 billion in 2020 (Vasiljeva, Shaikhulina, & Kreslins, 2017). The benefits of cloud services vary depending on the deployment model, the size of the company, the service model, adopted, the focus of the adoption as in whether to enhance scalability or cost reduction (Chen, Ta-Tao, & Kazuo, 2016). Cloud services offer an organization the ability to streamline processes, increase agility, faster adoption of new technology, eliminate waste, reduce cost, maximize profit, create and maintain strong competitive advantage must be pursued (Akasiadis et al., 2015; Albakri et al., 2014; Alkhalil et al., 2017; Vasiljeva et al., 2017). Many organizations have long recognized the need for scalability, skilled workforce, agility, and streamlined resources for maximum competitive edge (Chihande, & Van der Poll). Cloud services are changing organizations through the efficient utilization of resources, thereby saving money (Zhang, Zhang, Chen, & Huo, 2010).

In looking deeper to cut costs, efforts have been targeted often at discrete items such as electricity, cooling cost, data center floor space reduction, hardware cost reduction, software licensing cost reduction, staff reduction, and many more (Maresova, & Sobeslav, 2017; Newson, 2015; Vasiljeva et al., 2017). As a technology that enables organizations to offload a significant portion of their capital and operational expenditure and maintain rapid delivery of services, cloud services is a desirable proposition (Fleury, Milian, Spinola, Goncalves, & Fleury, 2015; Pavel, 2016; Subramanian, Abdulrahman, & Zhou, 2014). Information is currently growing exponentially in all organizations at the rate of 30-50% annually, which is fueled by recent legislation for data archiving resulting in exponential storage costs (Tallon, 2010). Corporate-owned data center numbers are projected to fall by 80 percent by 2025, and the savings may be devoted to cloud services, and the data will likely be passed to a cloud provider if the data can be stored securely and reliably in the cloud for easy access. Reducing the floor space of the data center is also a considerable reduction of IT cost (Newson, 2015) because purchasing less hardware means the need to have a massive data center on-premises, which cuts down drastically the IT budget (Chen et al., 2016).

Another benefit is the ability to minimize overprovisioning and under-provisioning (Dhar, 2012; Vasiljeva et al., 2017). Cloud services enable a user to make a choice of computing resources, networking, and other technologies over the internet on a pay-per-use basis (Aljabre, 2012; Knorr, & Gruman, 2012). One of the characteristics of cloud services is resource pooling (Mell, & Grance, 2011), which is made possible through virtualization technologies (Alali, & Yeh, 2012; Choo, 2010; Zhang et al., 2010).

With the consolidation of compute resources and making them available, cloud services have the appearance of infinite computing capacity and resources (Kim & Kim, 2016). What this means is that organizations can provision the exact resources that are needed and also have the flexibility to reduce the usage of allocated resources (Knorr & Gruman, 2012). This flexibility of helping organizations avoid over-provisioning and under-provisioning is a considerable cost saving mechanism as well (Mell, & Grance, 2011).

In addition to the reduction of capital expenses, organizations have the insatiable appetite to meet demands with quick to market products and services (Baltatescu, 2014; Kim, & Kim, 2016; Vasiljeva et al., 2017). In the traditional sense, the internal bureaucracy of hardware acquisition can often be a huge bottleneck to provide the infrastructure and platform for development activities to begin. Cloud services offer the ready platform for organizations to deliver to meet the growing and often time-sensitive seasonal demands (Baltatescu, 2014). Compute resources can be made readily available to an organization for developers to quickly develop software to meet business needs without having to suffer the internal bureaucracies for hardware and software acquisition and configuration (Kim & Kim).

Though security often has the primary challenge of cloud services (Abdellaoui, Khamlichi, & Chaoui, 2016; Baltatescu, 2014; Dhar, 2012). Information security is also a key benefit depending on the size of the organization (Nedelcu, Stefanet, Tamasescu, Tintoiu, & Vezeanu, 2015). For small and medium-sized companies, security is a significant advantage (Kim, & Kim, 2016) of cloud services because it provides centralization of data, security patches, multi-factor authentication, the economy of scale,

compliance, and certification, physical security, reduced cost of security testing, leveraging the skills of the cloud provider (Aljabre, 2012; Gupta, Seetharaman, & Raj, 2013; Nedelcu et al., 2015).

Adoption of Cloud services by Small Businesses

Cloud services are a better fit for small to medium size companies (Carcary, Doherty, Conway, & McLaughlin, 2014; Sonfield, & Lussier, 2014; Tehrani, & Shirazi, 2014). When large organizations have already immensely invested in a large footprint of infrastructure in their data centers, it does not make sense to throw all of that away to adopt cloud technology when they already possess the capacity to implement private cloud (Tehrani, & Shirazi). The large economies of scale of big organizations enable them to harness the infrastructure investments to quickly satisfy business demands (Armbrust et al., 2010; Kim, & Kim, 2016).

Small organizations, especially startup companies, to medium organizations stand to benefit greatly from cloud services because the capital expenditure necessary to implement elastic and on-demand computing is often too big for them to take on (Kim, & Kim, 2016; Vasiljeva et al., 2017). Especially in the cases where they have not invested a lot of financial resources in on-premise infrastructure, it makes sense to leverage the cloud at a cost that is relatively cheaper than having to implement from the ground up (Aljabre, 2012).

Because of the unique circumstances of small to medium-sized companies that make cloud services compelling, they must develop the capacity to make the right strategic decisions in the pursuit of cloud services (Quittner, 2011; Reach, 2017). The

right cloud service selection requires an understanding of the concepts of cloud services and the factors to consider in the choice of that platform (Ng, 2018; Sohaib, & Naderpour, 2017).

The analysis based on the quantitative and qualitative research by the authors was narrowly focused on the economies of scale by the large organizations as a reason not to adopt cloud services. The reasoning behind moving a critical and new application to the cloud was good and described a way to slowly embrace cloud services to decrease the current cost of data center expansion and overtime increase cloud adoption (Loebbecke, Thomas, & Ulrich, 2012). While it might be true that small companies do not have to spend vast sums of money on building infrastructure when they adopt cloud services, and therefore best positioned for cloud services (Ng, 2018), it is also true that large organizations can begin to enjoy the benefits as well.

Decision-Making Process by Small Business to Adopt Cloud Services

Strategic long-term goals and the tactical means of attaining them are fraught with uncertainties because it is difficult to understand and predict all the potential negative and positive outcomes. Small businesses face challenges in strategic decision-making (Myšková & Doupalová, 2015; Oliveira, Thomas, & Espadanal, 2014) because of the uncertainty and the difficulty to account for all the risks associated with the decision-making and attempts to manage risks are unsystematic and ad-hoc (Myšková & Doupalová, 2015). Strategic decision-making is fraught with trial and error approaches by small to medium-sized companies (Teirlinck, & Spithoven, 2013). Alkhalil et al. (2017) discussed the benefits of cloud services but also acknowledged the fact that it

requires a complex decision-making process. They argued for the need for a coherent approach to supporting the cloud decision-making model. A hybrid approach is prevalent because not all applications can go to the cloud. The decision to go to the cloud is often more difficult for established companies with running applications as opposed to companies that start from nothing (Alkhalil et al., 2017).

The definition of a long-term strategic goal is complicated because of the uncertain circumstances surrounding the risks. The risks and uncertainties could either be uncontrollable, partially controllable, or controllable (Myšková & Doupalová, 2015). The study of Myšková and Doupalová (2015) was to identify risks that could impact small to medium-sized enterprises. Their qualitative case study was to look at a small business and how the company made decisions and the impact of political, legislative, economic, social, and technological risks. Small companies often perceive their environment as uncertain (Eijdenberg, Paas, & Masurel, 2017). The quantitative study of Eijdenberg et al. was to investigate the effects of decision-making on small businesses in an uncertain environment based on an interview of 154 small business owners. The finding suggested that though uncertainty impacts decision-making, other factors such as business owner arbitrariness can also affect the outcome of decision-making. One model for organizational decision-making is intelligence, design, and decision. Intelligence is to look at the gathering of information about the company, the environment, and competition. Design is evaluating options, and the decision is selecting one of the solutions proposed. The decision is multidimensional, including technical, social, technical, and organizational considerations (Alkhalil et al., 2017).

The planning of cloud adoption requires a comprehensive assessment of multiple layers of the cloud infrastructure to determine the appropriate service provider, the security of the information assets, and the successful implementation. (Lotfi, Belahbib, & Bouhorma, 2015). The understanding of cloud services allowed management to identify opportunities, capabilities, potential risks, offering models, suitable configurations, level of support, risks, pricing models, potential providers, and the expertise required to manage applications in the cloud environment. Risk assessment, rigorous assessment of options, and projection of outcomes are essential to achieving set targets (Fazlollahtabar & Saidi-Mehrabad, 2015). Cloud services are a disruptive technology, and careful analysis must be part of the decision-making process to assess the impact of the radical changes to business operations. (Battilana & Casciaro, 2012). In cloud services decision-making, the adopters have to choose from the myriad of options among the cloud providers. There are over 100 cloud providers. Amazon alone has over 16k different configurations (Alkhalil et al., 2017).

Small business managers lack the knowledge about the internal and external business environment and related factors that are pertinent to their strategic decision support in a dynamic and rapidly evolving world (Khatun, & Miah, 2017). Realizing the environmental impacts at the early stages of a decision-making process is essential to avoid the confusion about the complex linkage exists between innovations that emerge internally and the external strengths and opportunities that affect the small businesses (Teirlinck, & Spithoven, 2013). Even though cloud services have several advantages, the critical concern has often been around security (Alali, & Yeh, 2012; Choo, 2010;

Grossman, 2009; Nedelcu et al., 2015; Zhang et al., 2010). Placing that information in the hands of a third party can have several implications (Kim, & Kim, 2016; Ng, 2018) which brings into focus the importance of decision-making the by small businesses and what they have to take into account for cloud services (Sohaib, & Naderpour, 2017). Decision-making has to focus on goals, expected returns, competitive analyses, and tapping into pre-existing knowledge, and predicting uncertain outcomes (Eijdenberg et al., 2017).

Understanding the Concepts of Cloud Services

Despite the well-advertised benefits of cloud services, managers who pursue cloud services should do so with a great deal of understanding of the factors in the decision-making as well as the strengths and weaknesses of the various cloud deployment and service models (Grobauer, Walloschek, & Stocker, 2011; Sohaib, & Naderpour, 2017). Successful cloud migration would require a clear understanding of the cloud environment, careful planning, system analysis, and execution to ensure the cloud solution's compatibility with organizational requirements while maintaining the availability and integrity of the organization's IT systems (Alkhalil et al., 2017). The scrutiny of the modes of the acquisition may encourage decision-makers in cloud adoption (Van Roekel, 2012). The board of directors and management must understand cloud services to set the tone for governance (Al-Ruithe et al., 2016). Managers and decision-makers must adopt a multicriteria decision-making (MCDM) technique because many uncertainties and nuances could lead to dire consequences. (Sohaib, & Naderpour, 2017).

Effective decision-making is often a function of data analytics that large companies have access to and can analyze. However, small businesses do not have the luxury of large datasets to use in decision-making. Many in management do not see any benefit and do not even plan to adopt cloud services because of infrastructure and security concerns, which in no small measure is because of lack of understanding (Akande & Van Belle, 2014). Limited literature exists to adequately align the strategic business targets with the knowledge of small business managers regarding the adoption of cloud services (AbuKhousa et al., 2012; Alshamaila, Papagiannidis, & Li, 2013; Nkhoma, & Dang, 2013). The lack of understanding necessitates a framework to guide the decision-making process.

Decision-Making Framework

Frameworks for decision-making are ubiquitous, and many can serve as a guide to managers in the decision-making of cloud services adoption (Sohaib, & Naderpour, 2017). Management often lacks a coherent approach to support cloud decision-making (Alkhalil et al., 2017). A vital framework is the technology-organization-environment (TOE) to explore the holistic and impactful factors (Sohaib, & Naderpour). Regardless of the immense benefits of cloud services, the decision-making process must go through the lens of the technology, organization, and environment (TOE) theory (Lian, Yen, & Wang, 2014; Low, Chen, & Wu, 2011). The technological endowment of an organization with its attendant dynamics of complexity, compatibility, and relative advantage are the key drivers for cloud adoption. Organizational considerations are top management support, firm size, and technology readiness. Environmental factors are competitive

pressure and trading partner pressure (Alemeye, & Getahun, 2015; Alkhater, Wills, & Walters, 2014; Low et al., 2011).

Another framework for cloud readiness assessment is the technology acceptance model (TAM), which looks at the perceived usefulness, perceived ease of use, and relative advantage (Alemeye, & Getahun, 2015). Diffusion of innovation is also a framework that consists of trial-ability and the observable result (TO), compatibility with current practices (Alemeye, & Getahun; Alkhater et al., 2014). All the frameworks can also be combined by pulling all the relevant considerations for decision-making (Alkhater et al.). These frameworks often focused on technological factors with limited attention to security (Alkhater et al., 2014)

The decision-making process in cloud services adoption can also look at the three angular metrics, i.e., project metrics, product metrics, and organization metrics. Having metrics of the projects, products, and the entire organization is a necessary condition in the decision-making process (Zhao, Nian, Jin, Yang, & Zhu, 2017). Without adequate projection based on the metrics to support performance and resource allocation, the adoption of cloud services could yield mediocre results. For high-quality software, it is essential to have accurate metrics. Cloud services are complex and require a multi-faceted approach in decision-making (Al-Ruithe et al., 2016). More than one theoretical framework is needed to tackle something as complex as cloud services. Technology, organization, and environment (TOE) and the strategic triangle, which emphasizes the triangle of business, organization, and information and Human, organization, and technology-fit (HOT-fit; Alharbi, Atkins, & Stanier, 2016).

Another framework based on the TOE, is becoming cloud services ready (BCCR) framework, which is based on empirical data and literature to guide the readiness of organizations and the roadmap to adopt cloud services fully (Akande & Van Belle, 2014) proposed. The readiness assessment of an organization is an essential ingredient in the decision for cloud services to minimize chances of failure in the implementation. Readiness assessment includes regulatory constraints and data ownership. TOE framework is the basis for BBCR. Technology and infrastructure of the existing organization and the scale may determine whether to stay private or go public (Akande, & Van Belle, 2014). The first step is why the change, the second step is considering the optimal speed of the change by assessing readiness through the TOE framework, and depending on the outcome, proceed to stage three, which is to adopt methods to manage resistance and implement cloud services. Several key considerations emerge from all the frameworks.

Critical Considerations in Cloud Adoption Decision-Making

Regardless of the framework, there are pertinent factors to consider in cloud adoption (Alkhater et al., 2014).

Cost. One of the most important factors in deciding to adopt cloud services (Koo, & Kim, 2015; Maresova, & Sobeslav, 2017; Newson, 2015; Vasiljeva et al., 2017). The cost savings are in the initial investment and operational benefit, in addition to accompanying expense to ensure secure data management (Alkhater et al., 2014; Koo, & Kim, 2015). The cost savings are not only in the capital expenditure but also in energy savings (Albakri et al., 2014). In looking deeper to cut costs, efforts have been targeted

often at discrete items such as electricity, cooling cost, floor space reduction, hardware cost reduction, software licensing cost reduction, staff reduction, and many more. The cost savings through offloading a significant portion of capital and operational expenditure leads to rapid delivery of services.

The cost savings must also be juxtaposed with the cost of risk management (Martens & Teuteberg, 2012). The cost savings from infrastructure and application platforms can put in bolstering security strategies. The traditional on-premise information systems are expensive regarding capital, and operational expenses, which means small to medium scale organizations with minuscule budgets may have to consider cloud services as a compelling alternative (Alharbi et al., 2016). Cloud services is appealing because it reduces the upfront cost and does not require having resident experts and instead focuses on the primary mission of the organization.

Security. The critical elements of information security are confidentiality, integrity, and availability (Koo, & Kim, 2015). Specific security issues include privileged user access, regulatory compliance, data location, data segregation, recovery, investigative support and long-term viability (Albakri et al., 2014; Rong et al., 2013). Lack of trust and transparency are among the main reasons hindering the adoption of cloud services. A complete security assurance framework that ensures an independent assessment of the systems after testing, monitoring and signing off is limited (Anisetti, Ardagna, Gaudenzi, & Damiani, 2016). Specific security controls around virtualization, data transmission with cloud services; service level agreement, denial of service attacks,

and identity management may address the challenge of ensuring data confidentiality, integrity, and availability (Abdel-Maksoud, Elbanna, Mahama, & Pollanen, 2015).

Putting the security controls in place can be enormous within the boundaries of an organization, but that challenge becomes magnified when that data is handed over to an external entity (Anjum, 2017; Martens, & Teuteberg, 2012). An organization must address the effects of data breaches, such as unauthorized information becoming available to the public or the threat of a malicious insider in the cloud organization compromising information (Anjum, 2017; Rong et al., 2013). In the event of a breach, the legal implications can be very complicated when the chain of custody includes a third party (Al-Musawi et al., 2015).

Every care must be taken to put in place processes and technologies to adequately protect the data in the cloud (Sandhu et al., 2010). Because of a very high potential for a data breach, additional mechanisms must be in place to minimize the damage that can ensue (Anjum, 2017). Such protection mechanisms include encryption and ensuring that the private key is kept by the organization who owns the data (Al-Jaberi, & Zainal, 2014), and also for organizations to develop a standard risk matrix to identify what mitigation steps can be adapted to minimize the opportunities for data breaches. (Anjum, 2017; Dhar, 2012). The security risks are not just limited to trusting a third party organization to protect precious organizational data but also multi-tenancy situation has security risks associated with it. Having to share the same physical infrastructure with others can often lead to accidental and malicious data leakage (Al-Jaberi, & Zainal, 2014; Shahbazi, Brinkley, Karahroudy, & Tabrizi, 2013).

Furthermore, issues of how to report security breaches and when disruption must be in the contractual agreements and the data must also be classified and valued before adopting cloud services (Ashford, 2012). Malicious insiders in the cloud provider's organization is also a critical consideration for cloud users (Grossman, 2009; Rong et al., 2013). The limited knowledge on cloud security concerns creates the need for additional research into cloud security (Choo, 2010). In spite of the security breaches if organizations can have a robust risk mitigation strategy, the benefits of cloud can outweigh the security concerns associated with it (Anjum, 2017).

Research on crucial security topics related to the cloud is therefore paramount (Rong et al., 2013; Sandhu et al., 2010). Striking a healthy balance between security and elastic cloud services is a challenge facing many organizations. The failure to appreciate security as a critical component of cloud services can expose an organization to severe risks with dire consequences including legal, financial and reputational losses that can at times result in significant loss of business and in some cases the collapse of the organization itself (Aditya, Premkumar, Anitha, & Mukherjee, 2014). Incident mangement in the cloud is different from when it is solely under the control of the company. The incident logs are not often available or visible to the cloud users which makes conducting forensics difficult. Such discussions are essential during the cloud adoption process and discussions (Alex, & Kishore, 2017; R. Samani, Honan, & Reavis, 2015).

Organizations can adopt cloud services to support infrastructure and systems software, but one thing that they may have to be mindful of is a robust security outfit that

can look at the different ways to protect the organization. Cloud users should adopt cloud providers who have credibility through certifications like ISO 27001(Albakri et al., 2014). Many of the existing traditional risk assessment frameworks assume on-premise deployments but does not focus on a framework for cloud risk assessment (Albakri et al., 2014). Risk management can help in avoiding, transferring, mitigating or minimizing the risks associated with being on the cloud (Al-Musawi et al., 2015).

Audit and compliance. Organizations invariably have to conform to various laws and regulation and compliance requirements (Albakri et al., 2014). They face new challenges in the context of cloud services because of the migration from on-premise to off-premise locations (Abdel-Maksoud et al., 2015). Several legislations like SOX, GLBA that regulate data privacy and stricter controls. The nature of public cloud makes it possible to meet these regulations (Alosaimi et al., 2017) because of the potential of data dispersal across multiple geographical locations and the loose boundaries around what is considered an information asset and who is responsible for it (Ahmad, & Janczewski, 2011). Different jurisdictions have different legal requirements (Madi et al., 2016). Some are as a result of federal or state laws; others are because the organization handles credit card or health data.

The legal department must be fully engaged in the arrangements around incident response planning. The cloud provider must have adequate tools to handle the incident especially for forensics (Samani et al., 2015). The challenges for forensics are because it is difficult to capture the cloud because it is across different geographical and jurisdictional boundaries (Ahmad, & Janczewski, 2011; Alex, & Kishore, 2017). Such

data brings with it specific stringent compliance and legal requirements that organizations must obey. Some regulations may compel organizations to have data reside in a particular geographical location because of jurisdictional limitations (Grossman, 2009). Even though cloud promises compute resources across different geographic areas because of the distributed and virtualized nature, it generates compliance concerns (Ahmad & Janczewski, 2011; Gupta et al., 2013).

In some jurisdictions, the restrictions around data may be too lax while it may also be very stringent in others. The legal and compliance requirements must always be addressed to ensure that the organization's data does not leave the appropriate jurisdiction (Choo, 2010; Samani et al., 2015). The flip side is that organizations who have been very worried about having to handle the compliance standards and processes can offload those to a cloud provider approved by the mandated audit outfit. Putting the right strategy to mitigate any compliance violations is a challenge all cloud adopters must pursue (Grossman, 2009).

Organizations can be able to enter new markets that they could not before as a result of stringent compliance requirements that they could not afford. If the cloud provider has implemented the required standards, processes and requirements then leveraging them makes sense (Cloud Security Alliance, 2013). To better deal with the security and compliance issues, a formal risk framework such as the Committee of sponsoring organizations (COSO) framework is necessary for analyzing risks associated with emerging technologies (Alali & Yeh, 2012).

Availability and reliability. A key concept in information management is reliability and availability (Alali & Yeh, 2012). All organizations exist to provide goods and service, and therefore anything that positively or negatively impacts these twin goals must be taken seriously (Armbrust et al., 2010). Deciding to place corporate assets under the control of another party has the potential to incur the negative consequences of availability and reliability of the systems (Sandhu et al., 2010).

If the cloud provider does not have the necessary redundancies and high availability built into their offerings, customers can often be disappointed resulting in the potential loss of business. The concept of service accessibility is critical in all cloud adoption discussions (Armbrust et al., 2010). Such concerns are usually in the contracts between the cloud adopters and providers in the service level agreements section similar to what traditional outsourcing entails (Dhar, 2012).

The centralization of computing resources often could mean a single point of failure. Organizations must spread out their workload across two or more peer-to-peer cloud services. The split of cloud services across multiple providers presents the challenge of authentication between the peering services (Poh et al., 2013). The authors looked at existing models of peer to peer networks and the various technologies such as distributed hash tables (DHT) and the different authentication models to enable the dispersal of the workloads. Availability of the computers and the internet access must be taken just as seriously as security because the two go hand in hand (Sandhu et al., 2010). Though the cloud offers several benefits such as affordability and extendibility, the critical concepts of reliability and availability are part of the character of cloud services

(Zhang et al., 2010). Organizations may have to invest a bit more in their internet service connectivity with sufficient redundancy, and high reliability (Armbrust et al., 2010).

Size and profile of company. Key factors create an enabling environment for cloud adoption but one theme that emerged from the various authors is the fact that all organizations whether it be legal, health, information technology companies, for-profit and non-profit organizations such as governments can all benefit immensely from cloud adoption (Aljabre, 2012; Armbrust et al., 2010; Choo, 2010; Dhar, 2012). The elasticity of computing resources and the overall cost reduction opportunities are attractive to all manner of organizations. The size of organizations determines the general adoption or the extent of cloud services adoption (Aljabre, 2012). When large organizations have already invested in a large footprint of infrastructure components in their data centers, it does not make sense to throw all of that away to adopt cloud technology when they already possess the capacity to implement private cloud (Armbrust et al., 2010).

The large economies of scale of prominent organizations have embedded within it all the necessary components that can be harnessed to quickly satisfy business demands (Armbrust et al., 2010). In small companies, cloud services provide an alternative to expensive implementation of information systems on-premise to store data. Cloud is easily accessible because anyone with a device with internet access and a browser can get to it. The benefits are a virtual presence, scalability, extendable and inexpensive, multi-tenancy, price per consumption and privacy (Dhar, 2012). Small to medium companies with scarce resources prefer cloud services because of the enormous upfront capital expense related to building and maintaining data centers on premises (Aljabre, 2012).

Other organization considerations are top management support, requisite skills availability, high criticality of work that cannot take an outage at all (Akande, & Van Belle, 2014).

Capital expenditure necessary to implement elastic and on-demand computing is often too big for them to take on. Especially in the cases where they have not invested a lot of financial resources in on-premise infrastructure, it makes sense to leverage what the cloud provider is already providing at a cost that is relatively cheaper than having to implement from the ground up. In the light of the above, Aljabre (2012), offered that cloud services are more appealing to small and medium organizations and not necessarily a good option for a large organization (Aljabre, 2012).

When the information systems do not already exist, then the decision to go to the cloud is more straightforward. Many barriers exist to impact the successful implementation of information systems by small to medium companies such as, lack of expertise, and weak infrastructure systems to support, financial constraints, and poor leadership which makes cloud services a compelling proposition (Albakri et al., 2014). The size and nature of the organization, and sensitive nature of the data and the utilization pattern whether it consumes large amounts of data across the wire (Akande, & Van Belle, 2014).

Management support. Low et al. (2011) argued that top management support is critical to the success of cloud services adoption. They discussed the importance of cloud services as a cornerstone of the strategy of IT companies to gain and maintain a competitive advantage. Management support is part of the Technology, Organization, and

Environment (TOE) framework. Without a firm commitment from top leadership regarding strategic direction, budgetary allocation and organizational drive, the challenges inherent in cloud services adoption cannot be overcome (Low et al., 2011). There are several aspects such as dynamic management of security policies and develop a framework to analyze tradeoffs between security and availability versus performance and scalability with top management commitment (El-gazzar, 2014; Sandhu et al., 2010). Senior management must exercise due diligence when dealing with cloud providers and ensure that there are robust service level agreements to protect their interests (Choo, 2010; Dhar, 2012). Management commitment must be clear, and firm for the successful adoption of cloud services.

Environmental factors. As organizations strategize to establish and maintain a competitive advantage in their respective industries, there are also times when organizations respond to changes in the environment in which they exist to shape the direction of the organization. Environmental factors are competitive pressure and trading partner pressure (Low et al., 2011). The need to outwit the competition necessitates quick to market targets. As the competing companies embrace technologies that shorten their delivery timelines, it creates momentum for others also to pursue same (Dhar, 2012). Cloud services is driving a lot of companies to greater heights, so companies seek it to stay competitive (Alkhalil et al., 2017)

Contract agreement and service level agreements. A record of the rights and obligations of service providers and their customers is in the service level agreements (Lu et al., 2016). The legal department must be fully engaged in the arrangements service

level agreements and issues around incident response planning, key personnel must be on the side of the cloud services user, and the cloud services provider and secure communication lines must be used to disseminate information in the event of a breach (Ahmad & Janczewski, 2011). Cloud services Level Agreements are essential to maintain continuity of service and improve trust (Hani, Paputungan, & Hassan, 2015). The service provider must also guarantee the availability of the service to avoid unexpected disruptions to the business (Ranaldo & Zimeo, 2016) as part of the service level agreement during the negotiations and discussions leading to the cloud services adoption (Ahmad & Janczewski, 2011; Wieder, 2011).

Adequate information must be supplied by the cloud services provider to the cloud services user to enable both parties to have a full appreciation of the capabilities and capacity of the cloud provider to make sure they are in the service level agreement (Ranaldo & Zimeo, 2016). The contract should also include monitoring by a third party wherever possible to gather event logs and other means of gathering evidence. Third party monitoring may guarantee the quality of service and satisfaction levels for the business. (El-Awadi & Abu-Rizka, 2015). The terms of the service agreement should not be ambiguous, and the penalties for violations must be spelled out in the service level agreement (El-Awadi & Abu-Rizka, 2015).

Future Research

Cloud services like all new and emerging technologies requires extensive research to address several issues such as security, availability, compliance and jurisdictional limitations and pertinent areas (Alali & Yeh, 2012). This study focused on the decision-

making process that small businesses go through in adopting cloud services. The concepts covered focused on what cloud services means, the benefits of cloud services, the risks associated with it, why it is a better fit for small businesses and the decision-making considerations in cloud services adoption. All of these are pertinent topics and have been discussed extensively in the various literature. What is lacking is a more in-depth analysis of what small businesses go through in their decision-making before adopting cloud services. There is little literature on a concise prescription of what small businesses should consider in cloud services adoption. Also, a vacuum exists in the area of security that needs to be filled (Choo, 2010). Strategies to achieve effective cybersecurity include developing a heterogeneous experimental cloud services; implement instrumentation to monitor the cloud; analyze performance and vulnerability threats; create new protocols to mitigate denial of service; build security enforcement mechanisms; enhance efficient implementation of virtualization; dynamic management of security policies and create a framework to analyze tradeoffs between security and availability versus performance and scalability (Sandhu et al., 2010).

Areas of additional research can be identified by effectively looking at recent market trends and how organizations are embracing them in addition to the different deployment models (Yu, Wang, Rashid, & Chuang, 2011). Some of the opportunities for future research include analytics, cloud reliability, social issues in cloud services and cloud workflow management (Yu et al., 2011).

Another area that needs in-depth research is virtualization since that is at the core of cloud services in general. Security, as it relates to virtualization, is a focus that future

researchers can pursue (Zhang et al., 2010). Additional research into the influences of environmental and organizational conditions on cloud services adoption across different industries is essential. (Low et al., 2011).

Overall Cloud Services Synthesis

Common themes of cloud services such as cost savings, elastic compute demands, avoidance of under and over-provisioning of resources, the use of virtualization as the foundation for cloud services, and the fact the certain conditions must exist for the adoption of cloud services by organizations is prevalent. Mell and Grance (2011) definition of cloud services is the most acceptable definition of cloud services, which is an affirmation of the universal adoption of the NIST definition of cloud services (Alali, & Yeh, 2012; Armbrust et al., 2010; Choo, 2010; Mell & Grance, 2011). In the face of the pervasive adoption of cloud, organizations must look at the security and privacy concerns of placing their vital information in the cloud (Armbrust et al., 2010; Choo, 2010; Grossman, 2009; Sandhu et al., 2010).

Organizations that seek to adopt cloud services must undoubtedly look at the internal structures to ensure that they can support the exigencies of cloud services. The strategic adoption of cloud services can change the structure of the organization in a significant way. In some cases, it can lead to the total elimination or significant reduction in the IT department which is a classic manifestation of how strategy can affect the structure of an organization. When the majority of the work is being done by an external entity at a lower cost, it invalidates the necessity of having a fully staffed IT department (Aljabre, 2012; Dhar, 2012; Grossman, 2009; Low et al., 2011)

Despite the three service models of cloud services (Mell, & Grance, 2011), the public cloud is predominant (Alali & Yeh, 2012; Aljabre, 2012; Choo, 2010; Dhar, 2012; Knorr & Gruman, 2012). Public cloud by definition means the elastic compute platform is hosted off premises and managed by a third party (Mell & Grance, 2011). The classic definition of cloud services does not categorize public cloud exclusively as what consists of cloud services but rather encompasses various activities that come together to form cloud services. Those essential characteristics include on-demand self-service, broad network access, resource pooling, rapid elasticity and measured service (Mell, & Grance, 2011). All of these crucial elements are possible when the technology is on premises.

The core of the cloud services argument is the need to offload the cost of capital expenses to an external party which typically is the driving factor for cloud adoption which is usually a plausible proposition for small to medium organizations (Aljabre, 2012; Armbrust et al., 2010). However, in large organizations, the data center provides a considerable economy of scale concerning infrastructure deployment, layering on the few technologies to create a self-service, on-demand, and elastic computing is becoming an easier target (Aljabre, 2012). The fact remains that cloud services should not be discussed purely from the public cloud perspective because those essential characteristics are possible internally. The references to cloud services should be in the context of a deployment model of cloud services. The other deployment models are private, hybrid and community (Mell & Grance, 2011).

The authors did not touch on an essential precursor to cloud services which is data classification (Paquette, Jaeger, & Wilson, 2010). Much as security and privacy concerns

are paramount, it becomes a less relevant topic for discussion when the sensitivity of data in the cloud is not significant. The benefits of cloud services are attractive hence the need to pursue cloud services. The strategy should be a deliberate collaboration among internal stakeholders such as internal audit, security, and legal departments to agree on what constitutes sensitive data. Intellectual property, customer data, employee data among other classes of data that the organization deems confidential and sensitive must all times be guarded with utmost diligence. For such data and the systems that contain them, it could be established as a policy to keep those on internal networks. All the other applications and data that the organization deems not too sensitive can be placed in the public cloud regardless of the size of the organization.

A large organization could still find value in using the public cloud when the cost of maintaining nonconfidential systems internally far exceed what the price would be if it is in the cloud. At the same token small to medium-sized organizations have to assess if the secret source of their existence is fit to be in the public cloud. Most large organizations started small but eventually emerged as titans in their respective fields because of the competitive advantage they built over the years which they protect from their competitors. Small to medium organizations cannot just place their systems in the cloud without due regard to data classification (Paquette et al., 2010).

There was a limited discussion on how internal departments and functional units are currently realigning to support cloud initiatives. The studies tended to purely focus on the enabling technologies and features of cloud services without looking at the organizational structures to help that paradigm shift. As cloud services emerges and

becomes an integral part of IT strategies, there have to be the internal organizational structures and dynamics that operate to manage the interrelationships and partnerships.

There are legal and compliance issues as well as managing various cloud services provider accounts. Related to the restructuring of IT departments is the reality of downsizing internal IT staff. That has a significant effect on many organizations. Businesses of all shapes and sizes have in the past 25 years or more grappled with maintaining a large IT staff. Cloud services is currently challenging that posture. Businesses now have the luxury of potentially offloading the headache to an external team to figure out the technologies that may best support their businesses especially in an era where most transactions are online (Dhar, 2012). The downside of that thinking is that IT should be an integral part of business strategies and organizations cannot afford to have external entities shape their business strategies as they fiercely look for ways to maintain competitive advantages.

Greater focus is on the cloud provider and cloud services as a technology but not nearly enough attention to the need for a formal framework for cloud adoption. Though Alali and Yeh (2012) discussed the COSO framework, it was done in the narrow context of audits and identifying critical areas for businesses that opt for cloud services. Beyond audits, there are various business, social, financial, economic, and legal frameworks that must be developed for all organizations to use in deciding whether to go the cloud. The considerations for companies may include what to place in the cloud, what controls to have in the cloud and what the impacts may be to the business regarding cost, social reputation and legal as well as jurisdictional implications.

Frameworks such as the Jericho model and other models including models that they categorized as service provider and service orientation; support and services contracts; internal private clouds; all in one enterprise cloud, one-stop resources and services; government funding; venture capitals and entertainment and social networking exist for cloud services (Chang, Bacigalupo, Wills, & De Roure, 2010). Though Chang et al. (2010) identified the weaknesses of all the cloud models, they offered some recommendations for staying viable and sustainable. The models they provided are for deployments and implementation. For organizations looking to enter cloud services as providers or customers, the models are beneficial but what they do not provide is a standard framework for all organizations who want to pursue cloud services to consult as a matrix of decision-making to guide adoption. The lack of standards and compliance restrictions is an area that needs to be looked at (Dhar, 2012).

Another area that received little attention is the legal dimension of cloud adoption by organizations. There are myriad of legal issues that come into play when organizations decide to place their data in the cloud. Countries throughout the world organizations are required to meet the strict requirements of various laws and regulations that cover the privacy of personal data and the overall security of computer systems. Such privacy laws often come with stringent penalties that could affect the very survival or organizations. Local laws, regional laws, national laws impact organizations that exist in a particular jurisdiction, and (at times depending on the nature of the organizational alliances) specific international regulations also may apply. The challenge arises when local laws contradict the laws of the jurisdiction that the cloud provider is operating within. The

privacy laws of the United States and Europe differ in certain areas for example, and therefore organizations have to be mindful of that when placing data in the cloud.

According to the Cloud Security Alliance (2013), contracts have to be in a clear and concise language, and the issues of discovery, a chain of custody, preservation, and forensics are critical in cloud adoption. Public cloud services must also not be spoken of in absolute and permanent terms because technology is transient and though it may hold a lot of promise now, many organizations are still not sure of how far they should take it. Cloud services could very well become utility computing (Knorr & Gruman, 2012) but it could also become something that is used by a niche market as organizations find better ways to streamline their internal IT processes to respond to the business.

Public cloud services could lose some momentum as internal IT departments take on the challenge to stay relevant and compete aggressively with public cloud providers. The literature on the potential for organizations for the next wave of internal IT readjustments as a direct reaction to the public cloud is limited. Companies employing the right mix of technologies such as virtualization and self-service portals, to serve internal business units with agreed chargeback is a path many organizations could pursue as a less threatening paradigm shift (Low et al., 2011).

Research Methods

The methods of research were predominantly case studies, with some literature reviews, surveys, interviews, and real work experience. The case studies were about financial institutions (Akande & Van Belle, 2014), small to medium-sized companies (Alshamaila et al., 2013), public organizations (Abdel-Maksoud et al., 2015) health

organizations (Alharbi et al., 2016). Some of the authors leveraged their experience in the IT industry to shed light on critical areas of their expertise (Choo, 2010; Dhar, 2012; Grossman, 2009). The experience in the field enriches the perspectives. The use of real-world industry data such as using research material from Lexis Nexis on SEC filings and financial accounting information is a source of information that goes beyond the traditional review of existing literature (Alali & Yeh, 2012). Some of the articles also reviewed existing literature that covers Amazon cloud services (Aljabre, 2012; Grossman, 2009; Zhang et al., 2010). That approach provides useful information since they are the leaders in cloud services however it could ignore some very innovative practices that are currently adopted by lesser-known cloud services providers.

The use of surveys, interviews with practitioners, as well as using existing use cases as a research method highlighted the current trends of cloud services as a supplement to the review of literature which may not be contemporary (Chang et al., 2010; Knorr & Gruman, 2012; Mell & Grance, 2011). Literature review for an ever-changing technology such as cloud services could be limiting hence the practical experience on the subject is necessary as well as case studies, surveys, and interviews. The downside of the using practical experience to write about cloud services has a danger of bias because the authors may choose to present their viewpoints which may not necessarily be what applies in all situations for all organizations. Regardless of the research method, the focus was identifying decision-making processes, frameworks used by cloud services adopters, strategic decision-making by small companies, and how cloud services influence small companies and to an extent large companies as a whole.

Conclusions

As discussed earlier, organizations evolve from simple to complex, single administrative structures to multi-departmental, and even become global titans while at the same time others who do not take advantage of prevailing conditions sometimes fail and cease to exist. Against that background, one of the well-documented vehicles for organizational transformations is technology.

From the industrial age to the current electronic technologies, organizations have successfully adapted to stay competitive and successful. Cloud service has emerged as a revolutionary technology that can shape the structure of organizations as well as the overall business and IT strategy. The challenge with cloud services just like every technology lies in how to mitigate the risks associated with them effectively.

The discussion in this document covered the benefits of the cloud, the challenges, and the future research opportunities. Organizations that can assess their current states, identify gaps and effectively leverage cloud services may create a substantial competitive advantages and position themselves for future technological advancements that build on what cloud services offers. However, a reckless adoption with no regard to the risks could lead to potentially disastrous consequences for those who adopt them. While identifying the benefits of cloud services, one thing that organizations must effectively grapple with is security which is an area that I seek to pursue in future research. There is extensive literature on cloud services benefits, cloud adoption frameworks, strategic decision-making by small businesses, and risks associated with cloud services however what is not prevalent in the peer-reviewed articles is the deliberate process adopted by small

businesses as they pursue cloud services. The literature focuses more on the high-level frameworks but not necessarily regarding the specific unique situations of small business and the exact framework that they must follow. The studies do not highlight if any of the problems in cloud services by small companies can be linked to the cloud adoption decision-making process.

Chapter 3: Research Method

The purpose of this qualitative multiple case study was to explore the decision-making processes in cloud adoption by three small businesses that span three industries: IT, legal, and health. Little is understood about how managers and leaders make decisions about adopting cloud services (Froehlich, 2015; Kshetri, 2013). The process of deciding and understanding the full ramifications of cloud adoption is essential to avoid any unexpected consequences that might emerge after embracing the technology (Lawler et al., 2012; Ross & Blumenstein, 2013; Shi, 2013; Sinanc & Sagiroglu, 2013).

Although cloud services have emerged as a driver for many organizations to do business faster and cheaper (Hobman & Walker, 2015; Yang et al., 2013), some companies have experienced spectacular failures when they have attempted to embrace it (Froehlich, 2015). In this study, I sought to identify factors that ensure successful cloud adoption (Caytiles, Lee, & Park, 2012). In most earlier studies of cloud services, researchers focused on operational and technical issues (Zhang, Waldman, Han, & Li, 2015). Few studies have been done that address cloud services from the perspective of the decision-making processes that organizations go through before adopting cloud services (Fazlollahtabar & Saidi-Mehrabad, 2015; Kshetri, 2013). The purpose of this qualitative multiple case study was to explore the decision-making processes in cloud adoption by three small businesses across three industries: IT, legal, and health. This chapter covers discussion about the research design and rationale, the role of the researcher, the multiple case study methodology, participant logic selection, field test, instrumentation, and issues of trustworthiness.

Research Design and Rationale

The overarching research question was: What decision-making factors have contributed to the success of companies adopting cloud services? I used a qualitative multiple case study to explore the process of decision-making. Qualitative research can be used for implementation evaluations (Yin, 2014). In studies where it is essential to know that a program achieved its application targets and to ascertain the level of commitment of the people to the implementation or the understanding of the goals of the implementation, a case study is appropriate (Erl, Mahmood, & Puttini, 2013; Patton, 2002).

This qualitative multiple case study was an exploration of the decision-making processes used by companies for effective cloud adoption (Baskarada, 2014). The information was extracted from interviews with management of the unit cases and the cloud providers and analysis of documentation and qualitatively coding the information (Krippendorff, 2013). The data were used to explore how effective the decision-making process was considering all the critical ramifications of cloud adoption including security controls and privacy concerns (Fazlollahtabar & Saidi-Mehrabad, 2015). This qualitative multiple case study included interviews, exploratory document reviews, and theme generation.

Qualitative research provides a detailed perspective on the subject study (Patton, 2002). I chose qualitative research to delve deep into the decision-making processes by small business managers as well as cloud services providers. The use of surveys for quantitative analysis can limit the opportunities to understand the reasons for decisions

(Patton, 2002). Qualitative research designs, such as grounded theory, phenomenological, narrative, and ethnography, were not applicable to this study because of the contemporary nature of the topic (Yin, 2014). A case study provided me the ability to work directly with three small businesses that have adopted cloud services to explore the decision-making processes for cloud adoption. I used a multiple case study to organize collected data from each of the three small businesses for in-depth review and comparison. The choice of the case study as the preferred method among others was because it applies to situations where the central research questions are *why* and *how*, where the researcher has no control over the events, and where the focus is contemporary (Baskarada, 2014; Krippendorff, 2013; Yin, 2014).

I sought to understand the phenomenon of cloud services in the real world as experienced by three specific cases: a small IT company, a small law firm, and a small healthcare provider. The unit cases selected are three successful small companies that have adopted cloud services as a cornerstone of the business and IT strategy. These three units of analysis were used because of their similarity in size, operations, and financial capacity. Having a focus on three distinct industries also provided a varied perspective that could provide unique insights as well as generalities (Yin, 2014).

The focus was on how and why these businesses decided to begin using cloud services, and the contemporary nature of the phenomenon makes a case study an appropriate choice (Yin, 2014). Through in-depth study, I sought to explain the strategic decision-making process these companies used over time in their unique contexts. The focus was a comprehensive gathering of detailed information about decision-making

(Fazlollahtabar & Saidi-Mehrabad, 2015; Patton, 2002), the process, and the operational activities surrounding cloud services for these organizations (Baskarada, 2014).

Having three cases as opposed to one helped to identify commonalities, patterns, and differences. The framework guiding the research was the case study protocol (Yin, 2014). The choice of the case study as the preferred method among others was because it applies to situations where the central research questions are why and how questions and where the researcher has no control over the events. Additionally, the focus was contemporary (Yin, 2014). For example, if a researcher wants to know how the closure of the largest employer in a community affected them, a case study is more appropriate to provide the researcher the opportunity to follow up to unearth more details (Yin, 2014). The case study was used because I sought to understand the phenomenon of cloud services in the real world as experienced by the unit cases. The cases selected were three small companies that have adopted cloud services.

A case study was an appropriate method for gathering data about organizations that have embarked on cloud services to explore their effectiveness (Hammer, 2011; Lawler et al., 2012). Literature review and interviews are sources to explore the cloud adoption strategy from the decision-making phase through full adoption. The quantitative study was not appropriate for this research because it does not lend itself for a detailed and in-depth exploration of the subject of study (Patton, 2002). Large samples are appropriate when a generalization is possible. Using a multiple case study design provided triangulation of sources for a more in-depth understanding to identify unique patterns and generalized themes (Yin, 2014).

Role of the Researcher

A qualitative researcher's role spans several stages consisting of thematizing, designing, interviewing, transcribing, analyzing, verifying, and reporting (Fink, 2010). My role in this study consisted of thematizing what was going to be studied, designing the research methodology, conducting and transcribing the interviews, analyzing and verifying the data, and reporting it. In addition to the interviews, I reviewed the literature, memo, and other internal sources of documentation related to the decision-making process of the three small businesses (Frankfort-Nachmias & Nachmias, 2007; Janesick, 2011).

I have over 20 years of experience in the IT field, which has provided me an extensive network of companies and industry practitioners that I have done business with in various capacities as management, supplier, or consumer. I also currently serve as a member of the University of Maryland University College cybersecurity advisory council, which provides me an opportunity to shape the curriculum of the cybersecurity program that includes cloud services.

My relationships with the three respective companies in the legal, health, and IT industries assisted me in conducting the study. My relationship with the management of the health organization was through an introduction by a friend and was formal without any personal ties. I have no supervisory or subordinate relationship with the participants. My relationship with the legal firm was a professional one as a client 10 years ago without any personal ties or positions of power. I have no relationship with the last small

business, which was an IT firm. Acquaintance with the president of the company was through a friend, and no supervisory or power relationship exists between us.

The interview process involved asking good and pertinent questions, being a good listener, remain adaptive throughout, develop proficiency in the subject matter of cloud services, and avoid confirmatory biases by acknowledging contrary evidence (Frankfort-Nachmias & Nachmias, 2007; Yin, 2014). Research results that were contrary to my research study were also acceptable research outcomes and further enriched the knowledge base as well as provided opportunities for future research. Because of that, I recorded and published verbatim what the participants said for member checking. The data collection portion of the case study protocol establishes the processes of gaining access to participants and gathering the necessary logistics for the data collection such as a personal computer, stationery, a location for writing, storage devices, and recording machines (Janesick, 2011; Patton, 2002; Yin, 2014). Key informants received the schedule for data collection. I used the services of a transcription service as well as ensuring easy access to printers and copiers (Janesick, 2011).

Sources of information included documentation, literature, and interviews. The documentation consists of business plans, internal memos, progress/status reports, contracts, internal study reports, and annual and quarterly earnings reports, articles appearing in mass media, and journal articles (Frankfort-Nachmias & Nachmias, 2007).

Informed consent from the appropriate levels of management of the companies that constitute the units of analysis ensured access to the relevant information with the assurance of the sanitization of the gathered data and ensuring confidentiality. A routine

data backup strategy prevented unexpected data by backing up the data to an external storage device (Janesick, 2011).

Methodology

The population for the multi-case study was three small businesses in the legal, health, and IT industries and three cloud services providers, making a total of six companies in general. I interviewed two executives from each company, making a total of 12 participants. Defining the unit of analysis in a case study was an important step. The case in this study was two executives in each company who have direct involvement in the strategic direction of the company as well as two executives from three cloud provider companies. In my study, I have decided to use a multi-case study to cover three different cases to draw a single set of cross-case conclusions about the cloud decision framework (Baskarada, 2014; Patton, 2002; Yin, 2014). I did not choose a single case study because it was more appropriate when the case was an extreme or unusual circumstance or a typical situation (Yin). The use of cloud services was prevalent in several industries, and it enhances because of the inherent benefits (Koo, & Kim, 2015; Maresova, & Sobeslav, 2017). In the three chosen sectors, health, legal, and IT, cloud services offer an opportunity to achieve efficiency and save cost. Most organizations prefer to focus on their core competence instead of taking on the implementation and maintenance of large-scale IT deployments. The three industries are different regarding their core focus, and therefore understanding the decision-making processes of three distinct companies in various sectors may yield additional insights that might not be present for a single sector. The choice of healthcare was because cloud services provide

the platform to store patients' data in cloud servers for the advantage of easy retrieval at any time (Elsayed & Azer, 2018). Healthcare providers can focus their energies on their competence in healthcare delivery. That makes cloud services compelling, especially for the small healthcare provider with a limited budget for technology.

In the legal sector, lawyers have also embraced cloud services for e-mails using Gmail, for research using LexisNexis, and preparing briefs using Microsoft Office 365. Cloud services have many benefits for the lawyers but also has shortcomings (Elm, & Broderick, 2015). Lawyers would instead focus on the volumes of information in their cases and not have to invest the implementation and management of IT infrastructure, by embracing cloud storage services like Dropbox and Box.com which are more affordable than technology implementation and the attendant technical staff required to maintain. (Elm & Broderick, 2015). Technology companies, span the entire gamut of systems and software engineering in either writing code, developing hardware, or performing systems integration. For technology companies, cloud services offer a compelling proposition because they all have their foci in either writing code, building hardware, or performing systems integration.

Their foci may preferably be on their core competencies and outsource the implementation of the infrastructure and management to someone else. Information technology companies, by their nature, thrive on innovation, and cloud services was a platform that helps companies to achieve quicker results (Cui, Ye, Teo, & Li, 2015). A Case study was a popular approach among qualitative researchers because it provides the flexibility to delve deeper into complex subjects in real life (Hyett, Kenny, & Dickson-

Swift, 2014; Taylor, & Thomas-Gregory, 2015), case study allows for the incorporation of different study designs and methods (Hyett et al.). A case study has the disadvantage of lacking the ability to produce generalizations and not applicable in situations for the testing of particular treatments (Hyett et al., 2014; Taylor & Thomas-Gregory, 2015).

Cloud services adoption was a complex activity (Alharbi et al., 2016; Aljabre, 2012). A look at multiple cases results in a broader view of the decision-making process in cloud adoption, and to identify patterns and emerging trends (Vohra, 2014). The development of an accurate decision-making model was affected by several parameters and their correlations and further compounded by uncertain market conditions (Ball, 2011). To study a contemporary topic such as technology, the study must encompass multiple cases (Yin, 2014).

The evidence from multiple sources was often more compelling and robust even though it can be more time consuming and expensive (Fusch & Ness, 2015; Patton, 2002; Yin, 2014). The rationale for the choice of multi-case study was to use heterogeneous participant groups to confirm, dis-confirm, and compare and contrast the various views on cloud services decision-making. The multi-case study can often create sufficient credibility for the study (Yin, 2014). Decision-making practices about cloud services were a contemporary phenomenon that lends itself to a case study research design (Hammer, 2011; Ross, & Blumenstein, 2013).

The structure of the case study protocol had four sections. The first section was a high-level overview of the study that shows the goals of the study, issues, and a list of literature on cloud services. The second section shall consist of the procedures for

collecting data, defining the possible sources of evidence, procedures for maintaining the confidentiality and for the protection of subjects, the showing of credentials, and reminders about appropriate logistical requirements (Janesick, 2011). The third shall focus on the research questions that guided the data collection. The fourth section guided the case study report for the outline, format presentation media, and bibliographical data.

A case study was an appropriate form of gathering data about organizations that have embarked on cloud services to explore their effectiveness (Hammer, 2011; Lawler et al., 2012). The exploration was through literature review and interviews to understand the cloud adoption strategy from the decision-making phase through full adoption.

Participant Selection Logic

Several industries have emerged as directly relevant to cloud services, namely; health, IT, legal, manufacturing, education, and public organizations. Because of limited resources and time, I selected three industries that are not related but do use cloud services in legal, health, and IT sectors. In a qualitative study, the focus was on an in-depth understanding based on relatively small samples instead of large sample sizes to draw empirical generalizations (Patton, 2002). Identifying and describing the main themes from multiple sources highlighted the variation that exists (Chakhar, Ishizaka, Labib, & Saad, 2016). The use of multiple-case studies enables both a realist and a relativist perspective (Patton, 2002). With that in mind, the choice of the three distinct cases both in context and time from different industries was critical to deriving a set of cross-case conclusions (Vohra, 2014).

Attention to variations in the strategy and unique perspectives by the principal actors in each organization, as well as identifying pre-existing conditions that may have affected the strategic choices, was essential (Yin, 2014). Selecting a small company in each of the industries that have adopted cloud services provides a reasonable variation in the study of their decision processes and accompanying reasons for the decisions (Vohra, 2014).

There was a total of six companies comprising three cloud services providers and three cloud services user companies. Having access to senior executives in any company can be difficult; thus, I have limited the number to two executives per company to get a diversified perspective and insight into the decision-making process. Concerning the respondents, there was a total of 12 business executives—six from the cloud services user companies and six from the cloud provider companies. From the user perspective, the focus was on the decision-making process and from the perspective of the providers, their expectations as it relates to what cloud users consider before adoption enable them to improve (Ada & Ghaffarzadeh, 2015). The key criterion was a company that has adopted cloud services as a strategic business decision either as a provider of cloud services or a user of the cloud services service. The demonstration of how a company meets the criterion was the use of cloud services as part of their core business function. The choice of two executives from each company as participants was because strategic decision-making was a management activity, so the focus was on those who are involved in the decision-making process. The rationale for having executives from three companies in entirely different industries was to provide a varied perspective, which was also further

enriched by interviewing executives from cloud services providers. Each of the companies was contacted directly through corporate affairs to identify two executives that can be interviewed. Each was contacted directly through an email requesting multiple interview schedules.

The contextual considerations involved locale and general economic conditions at the time of cloud adoption. The boundary of the research was around activities that were related to the decision-making process. Last but not least, was comparing the unit cases to what other researchers have previously done and consult a vast array of literature to examine how the unit cases were selected to validate the choices. Multi-case studies are in-depth studies that delve into great detail and was often based on two or more unit cases to enable the researcher to do a detailed cross-case analysis. Selecting more than one-unit case allows the researcher to identify commonalities and differences. For this research, three separate companies are in different industries to offer varied perspectives (Yin, 2014). With 12 different interviews about the same topic, there was adequate coverage to provide enough data to do pattern matching and descriptive analysis to attain saturation in this study.

Instrumentation

The use of audio recorders, Microsoft Word, Microsoft Excel, Microsoft PowerPoint, Microsoft OneDrive, and RefWorks, captured all the relevant information and forms of data for the research. Microsoft Excel and Microsoft Word were used to take notes during the interview, and the recording of the interview was done with an iPhone 6 using the voice memo app with the prior consent of the participants. The use of

an external drive to back up the research data ensured recoverability in the event of a data loss (Janesick, 2011). A consent form was also on the list of items stored in a folder for distribution to all the respondents.

The research question was based on the literature covering considerations in decision-making for cloud adoption (Artikis, 2014; Guo Z., Wong, & Guo, C., 2014; Sun, 2015) as it relates to the strategic direction of the organization (Baskarada, 2014; Cai, Wang, & Huang, 2014; Echols, 2015). Computer-aided qualitative data analysis (CAQDAS) was used for the data analysis and to gauge the saturation of data (Fusch & Ness, 2015). The selected CAQDAS tool was Atlas.ti which was a workbench tool for analyzing text, images, and audio files (Friese, 2014).

Procedures for Recruitment, Participation, and Data Collection

Most of the research data was from interviewing executives of the cloud services users and cloud services providers. The interview was an effective way to ensure data gathering through structured questions to multiple participants (Fusch & Ness, 2015). The data collection portion of the case study protocol establishes the processes of gaining access to respondents and gathering the necessary logistics for the data collection such as a laptop, stationery, location for writing, storage devices, Microsoft Office package, and audio recording machines (Harper & Cole, 2012). See Appendix C for a step-by-step procedure for the data collection.

Documentation of publicly published federal compliance of cloud services based on the Federal Risk and Authorization Management Program FedRAMP guidelines on Cloud adoption and the core of NIST standards was a critical source of data (Morse,

Lowery, & Steury, 2014; Wijen, 2014). The primary method of data collection in this multi-case study was to interview key people (Harper & Cole, 2012; Yin, 2014). The nature of the interview was open-ended to provide greater flexibility for the participants to provide all relevant information. The significant elements of the data collection included securing access to the organizations and the respondents, having adequate data gathering logistics including writing and recording materials, establishing a clear schedule of dates and times for the interviews, and accounting for unanticipated events that might arise on my part and that of the respondents (Yin, 2014).

The interview questions consisted of specific questions for respondents, specific questions for the unique organizations, questions that were related to patterns and emerging trends; general questions related to cloud services decision-making; and finally, general open-ended questions regarding recommendations and policy guidance (Yin, 2014). See Appendix A for the interview guide of cloud services consumers and Appendix B for the interview guide for cloud services providers. Transcription services and easy access to printers and copiers was part of the preparation. Scheduled meetings with each small business to review any decision-making framework literature that was consulted by the small businesses and scheduled meetings with an executive from each of the cloud services providers to generate detailed notes accompanied by the recording.

All hard copy documentation was scanned and stored in an external storage device and Microsoft OneDrive cloud storage. All interviews and access to information were preceded with informed consent from the appropriate levels of management of the

companies that constitute the units of analysis to ensure access to the relevant information. All privacy data in was removed and anonymized and kept confidential.

A routine data back strategy to back up and store the data to cloud storage to make it accessible from anywhere was necessary to mitigate unexpected data loss. A formal IRB approval was secured before embarking on the data collection. The case study protocol included a detailed guide for the interview.

Interview. I used an interview guide with semistructured questions. Each interview session was 1 hour. The combined interview strategy provided the opportunity to probe further to enhance the depth and breadth of the topic. Using a consistent set of semistructured questions ensured consistency in eliciting cross-case patterns (Janesick, 2011; Patton, 2002). Concerning the interview guide, the questions were presented to the participants ahead of time to guide the interviews. The interview guide ensured consistency (Onwuegbuzie, Leech, & Collins, 2010).

The meetings were scheduled for 1 hour and covered questions about the organization, the management structure, overall decision-making approach, the structure of management, and the background of the decision-makers to establish a foundation knowledge about the organization and the decision-makers (Ada & Ghaffarzadeh, 2015). Follow up interview meetings were not needed because all the information was gathered during the first meeting for the respondents (Kallio, Pietila, Johnson, & Kangasniemi, 2016).

Appendix A included the questions in the interview guide and the questions in the standardized open-ended interview. Interviews were useful in gathering data to explore

the decision-making process that goes into cloud adoption (Cegielski, Jones-Farmer, Wu, & Hazen, 2012; Liu, Tan, & Qiaolin, 2012). I established an atmosphere of equity to ensure an open and candid interaction without influence to gather accurate data by stating that position upfront in all the interviews (Qu & Dumay, 2012).

Participants were made comfortable by explaining the purpose of the research and its benefits and seeking their consent to elicit the correct information. These principles helped to motivate the cooperation of the respondents (Kallio et al., 2016). I used all the proper logistics, such as audio recorders, microphones, and notepads, to capture all the relevant information and forms of data during the research. A consent form was also on the list of items stored in a folder for distribution to all the respondents (Harper & Cole, 2012).

The location of the interviews was identified, and the case units for the interviews were two members of executive leadership in each of the cloud services user and cloud services provider organizations to elicit varied perspectives on the subject of the cloud services decision-making process. The schedules were published ahead of time to give respondents ample time to prepare for the interviews (Harper & Cole, 2012).

Post interview. Quality assurance of the data gathered was performed by checking recordings and writings immediately after the interview (Harper & Cole, 2012; Patton, 2002) and pursue clarification for all ambiguities. There was one scheduled interview with all the participants. After the transcription of the recorded interviews, the participants reviewed the report for consistency and clarity taking into consideration the meaning of slangs as a prelude of the actual data analysis in addition to reviewing the

literature to see how the findings compare with what other researchers have reported regarding determinants of successful cloud adoption (Lawler et al., 2012). After the interview, the participants were fully briefed on the study and to solicit any immediate feedback. After the analysis and the research report, participants received the research analysis and findings for member checking, and for them to also have the opportunity to provide any feedback on the interview process and to discuss recommendations.

Data analysis. The focus was on context-sensitive and holistic strategic themes for data analysis for an effective cross-study of the unit cases (Patton, 2002). The two analytic techniques for this qualitative multi-case study were pattern matching and cross-case synthesis (Yin, 2014). Pattern matching helped me match research questions with an empirically based pattern in the collected data (Trochim, 1989). However, negative findings were analyzed as they emerged from the received data. Because this was a qualitative multi-case study, I used cross-case synthesis to identify commonalities and differences from the different perspectives either as a cloud provider or cloud user; or as a cloud user in various industries. Identifying patterns from the data collection and analysis procedures can lead to future inductive theories (Yin, 2014).

The decision to use pattern analysis was to provide me the laxity to pursue further leads that might not have been initially apparent, but later emerge to be germane to the study (Seidman, 2013). There might be factors that appear as accidental triggers that were not deliberate strategic choices, but in those cases, as the pattern emerges, were further pursued to formulate substantive theories for future studies. The presentation did also cover negative factors (Mahoney & Goertz, 2004).

Using pattern matching and cross-case synthesis techniques helped me in the analytic generalization as well as a thematic synthesis for case-case analysis (Ring, Jepson, & Ritchie, 2011). Pattern matching helped to find common themes throughout the data (Seidman, 2013). The technique of enhancing transparency in reporting qualitative research (ENTREQ) was used throughout the analysis phase as a framework (Tong, Flemming, McInnes, Oliver, & Craig, 2012).

For a framework or guidance for the data analysis, the first focus was on the research questions to identify the answers and further create a category of themes ahead of time (Yin, 2014) and also identify rival explanations and as alternative theoretical propositions. The data analysis consisted of pattern matching, critical analysis, and cross-case synthesis to determine the themes and the chronological progression of the cloud adoption framework by the unit cases (Yin, 2014). I reviewed all the evidence and account for all rival explanations; the most significant aspect of the study was analyzed and not marginalized and leveraged my industry knowledge to demonstrate awareness of the contemporary direction of cloud services (Yin, 2014). The data gathered from the analysis was subsequently formatted for presentation and reporting.

Case study report. After the data analysis, the thematic and cross-case synthetic findings were put together for a presentation in both textual and non-textual forms, both as a case study report and a PowerPoint presentation. The use of PowerPoint and RefWorks as qualitative research tools made it easier to manage the presentation of the data and the bibliography (Atchison, & Palys, 2012; Onwuegbuzie et al., 2010) and tables

and charts. Negative cases were reported in addition to different themes that emerge from the data analysis similarly (Patton, 2002; Yin, 2014).

The format was a multiple-case study. Each unit case was presented with the themes and findings illustrating the organization, history, the description of the research method, the literature sources, the data collection method, the strategies for data analysis, and the research findings. The report includes the decision-making process to adopt cloud services, the process of embracing cloud services, and the factors that impacted business performance negatively or positively.The themes were subsections under negative and positive factors. In addition to each case, the full report also covered the cross-case analysis and results (Yin, 2014). The overall structure was a detailed linear-analytic report intended to keep interpretation to a minimum (Patton, 2002, p. 503).

Discussion. The discussion covered the research process, including the experience that led to the gathering of the data, the caveats and an explanation of the unique situational experiences in each company, and analyze their peculiar economic circumstances that might have influenced the outcome of their decisions. The discussion included problems I encountered, my observations, and existing work on the cloud adoption framework in the study (Shi, 2013).

The discussion was not an interpretation of the data but a detailed account of the findings and the personal insights and perspective developed during the research experience. Additional information that I gathered but not part of the original intent as well as contrary and alternative theoretical explanations was in the discussion. Unique perspectives from different groups in the interviews were analyzed as well. My personal

experience with cloud services was shared to provide a background of my reflexive insight into the topic.

Issues of Trustworthiness

Credibility

The three main components of a qualitative inquiry, are rigorous methods, the credibility of the researcher, and a fundamental appreciation of qualitative inquiry by the researcher (Patton, 2002). Conducting a member check enhanced the credibility of the study. The responses were reviewed after each interview, with the interviewee for feedback and accuracy. The interview transcripts and answers were shared with the interviewees for accuracy (Harper & Cole, 2012).

The interview was a neutral inquiry by avoiding leading questions and probe further to establish a more in-depth understanding. Furthermore, the gathering of the data from different industries, different companies, and different individuals within each organization as a triangulation of sources of data provided a broad forum to find alternative views and perspectives. Contrary or contradictory cases were reported to enhance the credibility of the research without any interpretations (Kern, 2016; Reynolds et al., 2011).The triangulation was not only regarding interviewing three cloud services users and three cloud services providers but also reviewing publicly available information about the cloud providers to ensure consistency. Interviews and literature reviews from the sources spanned three months to provide the data.

My competence in the subject matter regarding 20 years of experience in the IT industry and several certifications in cloud services provided me the credibility that was

required in establishing research quality and reliability (Patton, 2002, p. 552). I have over 20 years of experience in the IT industry, with half of that time in management positions. I have led an enterprise project to implement cloud services in a Fortune 500 company successfully. Triangulation of sources and methods to corroborate research findings were shown to demonstrate the quality of the study in addition to the dissemination of the draft report for the respondents to review for accuracy and make sure that the report was an accurate description and also looked from the perspective of the reader (Frankfort-Nachmias & Nachmias, 2007; Krippendorff, 2013; Yin, 2014).

I clarified my bias from the outset of the research to show understanding of the subject matter to enable them to form their conclusion taking into consideration my worldview and perspective and remain neutral throughout the interviewing process and not act in any way to affect the respondents' outlook one way or the other (Hardin, Robitschek, Flores, Navarro, & Ashton, 2014). The avoidance of leading questions and concealing my position on the subjects enhanced credibility. Using multiple cases was another to demonstrate research validity (Yin, 2014).

Transferability

Given the fact that cloud services providers can support multiple industries, their offerings are standardized and not contextual to each sector. The mix of technologies and deployment models may vary from health, legal, and IT companies. However, the decision-making framework in general for cloud adoption mostly revolves around placing data in the hands of a third party. The research findings and processes may be

transferable to other industries and companies regarding the decision-making process (Stanciu & Petrusel, 2012).

Dependability

To produce a dependable study, I kept an audit trail of the activities during the study with regards to where, who, when, and what was studied. I kept an audit trail of all the meetings, recorded the interviews for subsequent transcription, took copious notes as a backup in the event the recording had problems. An audit trail was vital to minimize bias and enhance accuracy and impartiality. An audit trail was also an effective way to reduce bias when the entire process was transparently documented. Having a triangulation of sources and methods provided consistent and more in-depth coverage of the subject matter (Kern, 2016; Patton, 2002).

Confirmability

The report on the research data was a detailed descriptive manner without any personal interpretation that could give it a different meaning. The essence of a descriptive manner was to ensure that if another researcher came behind me, the results would be the same. The confirmability also required a clear and concise coding method based on themes that enabled me to understand the data. The case study protocol detailing all the data collection methods and analysis were prepared for an independent, objective assessment.

Ethical Procedures

To ensure ethical research study and garner agreements to gain access to participants or data, I sought permission from the Institutional Review Board (IRB) and

the consent of the participants before interviewing them using informed consent. The interviewees were under no duress to talk to me and had the flexibility to pick the time and place that suited their schedules for the interviews. They were free to stop the interview at any time or call me back for additional information at their discretion. Interviewees had ample lead time for all scheduled meetings to enable them to prepare for the meeting. In the event of a conflict of appointments, they had the opportunity to reschedule. If any of the businesses are unable to participate and decided to pull out, another company with a similar size and profile was to be used as a substitute.

All the artifacts, including informed consent, were stored on an external drive in an encrypted volume and only to ensure confidentiality, availability, and integrity of the data. If the participants opted for anonymity, their names and addresses were sanitized, but all the actual data stayed intact without providing obvious clues for the reader to make direct correlations.

The primary repository of the research data was an external drive for periodic back up of the data to Microsoft OneDrive through an encrypted volume to serve as a backup in the event the primary data store becomes unavailable either through damage, theft, or corruption. The data was in an encrypted drive that is accessible only by me to ensure confidentiality. All proprietary privacy data was removed and shared with only the participants who shared them and no other entity. For dissemination, the information was sent via email to verified email addresses from me. After the completion of the research, confidential data on the encrypted drive was deleted.

All research work was conducted on my own time and not at the expense of my current employer. All studies were before or after work and on weekends. There were no incentives for the participants. However, thank you letters or cards were sent to the participants after the research. All data in paper form gathered during the research will be shredded after 5 years. Electronic forms of the data have been stored in an encrypted secured disk for secure storage.

Summary

The purpose of this qualitative multi-case study was to explore the decision-making processes in cloud adoption by three small businesses that span three industries: IT, legal, and health. Having a deliberate decision-making process that accounts for all the necessary considerations was vital to success (Aljabre, 2012). The conceptual framework for this study was based on the strategic decision-making model (Mintzberg et al., 1976). Though the model has four variations, the universal theme of the model was to understand the problem, break it down in alternative solutions, decide on a final solution, implement it with a focus on external factors, management support and organizational learning environment (Kavis, 2014). I used for the foundation a modified version which had four main components with three influencing factors. The four main components are decipher, define, decide and deploy. The influencing factors are the support of management, prevailing positive external factors and organizational learning.

The multi-case study was on three separate small businesses that have all adopted cloud services to better understanding their decision-making processes before embarking on the cloud journey, and three cloud providers to seek their perspectives as well. The

primary source of data gathering was interviews. The participants were the executive leaders of these companies who have direct involvement in the decision-making process. The perspective of the cloud providers themselves were looked at by interviewing two management resources in three cloud provider companies.

Instrumentation consisted of voice recorders, Microsoft Office, laptop, notepad and pen, and RefWorks to organize the data. The participants were free to participate at their own flexible, available time. All gathered data was secured in an encrypted volume to protect it from breach of confidentiality, and integrity. The data was also backed up to Microsoft OneDrive in an encrypted disk as a means to provide recoverability in the event of data loss or corruption. The study followed case study protocol and methodology for subsequent data analysis, and a discussion of the findings for a final report that was published. After the collection of the data, the focal point of the research was the analysis and presentation of the research report. All the work in the current and chapters above was to lay the foundation for the research findings. The results produced by the analysis was presented in Chapter 4. These findings were used to provide the basis for the conclusions and implications in Chapter 5.

Chapter 4: Results

The purpose of this qualitative multiple case study was to explore the decision-making processes in cloud adoption by three small businesses that span three industries: IT, legal, and medical. The strategic decision-making model was the conceptual framework for this research as put forward by Mintzberg et al. (1976). This model asserts that decision-making is a planned act that requires a thorough assessment of all the factors that go into producing a successful outcome. In this case study, I explored how management considers the full ramifications of cloud services to avoid unforeseen dire consequences. Strategic decision-making is what differentiates a company from the competition (Li & Sujirapinyokul, 2010). The decision-making covered understanding the problem that cloud services solves and the alternatives that exist to address it. The focus was on the process of decision-making within the context of three small businesses to explore their decision-making styles for cloud services adoption.

The main research question was: What decision-making factors have contributed to the success of companies adopting cloud services? The supporting research questions in the study align with the decision-making and the general understanding and preparedness of the small companies in making the decision. The identification of the gap in the literature and the research study findings resulted in providing answers to the research questions, providing a future research opportunity for further exploration of the research problem.

Four main areas of the supporting questions focused on the profile of the organization, management understanding of cloud services, decision-making strategy of

cloud services, outcomes of cloud services. The questions for the profile of the organization included the following:

1. What is the industry of your organization?

2. What is the primary service or function of your organization?

3. How does your organization use cloud services?

4. Which department performs your internal information technology functions?

5. What is the highest decision-making department in your organization?

The questions that explored management's understanding of cloud services were:

6. Explain what cloud services is.

7. What are the benefits of cloud based applications to your organization?

8. How does your organization use cloud services?

9. What challenges or drawbacks have you experienced with using cloud-based applications?

10. How does cloud services enhance your competitive advantage?

11. What makes you comfortable to store your data in the cloud?

12. What training did you receive to gain a greater understanding of cloud services?

The third category of questions explored the decision process of organization. The questions were:

13. What were the primary considerations in the decision to go the cloud?

14. What was your role in the decision to go to the cloud?

15. Describe the formal framework you consulted in the decision-making process?

16. What obstacles did you face in the decision to adopt cloud technology?

And the last set of questions focused on the outcomes of cloud adoption:

17. What were the unforeseen factors the emerged during the decision-making process that was not known before?

18. What has been the positive outcome of cloud adoption?

19. What has been the adverse outcome of cloud adoption?

20. What has been the effects of cloud services on the internal IT staff?

Chapter 4 covers the discussion on my research setting, demographics, data collection and analysis procedures, and trustworthiness. Trustworthiness evidence are in consideration of credibility, transferability, dependability, and confirmability. Later, in Chapter 4, I show important study results and conclude the chapter.

Research Setting

The screening of participants focused on respective roles in participating in the decision-making processes to adopt cloud services in their various organizations. As individuals who were directly involved in decision making or in positions relevant to cloud adoption or aiding in the decision-making processes, they were selected because they are in ideal positions to provide firsthand information from their own perspectives. The screening process led to identifying the appropriate and willing participants. The selected participants were in various levels of management positions, some who had made decisions in cloud adoption either for the organization or for a client organization,

or senior-level technical experts who were also in position to test and recommend technologies, or client executives who provided guidance to cloud user companies regarding the appropriate cloud service offering. The participants also included leaders in cloud user organizations who were either in managerial or senior technical positions to achieve expected outcomes. Each prospective participant responded to a request through an email to participate. I selected participants who could offer direct and relevant perspectives related to cloud service adoption and outcomes. My respondents were two groups: cloud providers and cloud users. Each group represented the three distinct companies with each having two respondents. For each category, I chose six interviewees, making 12 total interviewees.

After receiving confirmation from each of the participants, I discussed convenient times and places for the interview suitable to their respective schedules. Given the busy schedules of the respondents involved, this proved rather difficult and took much longer than originally anticipated. It spanned over 3 months before I was able to interview all the participants. Work demands and conflicting schedules resulted in difficulties in getting the interviews scheduled and completed. This resulted in last minute cancellations and rescheduling of interviews. I had to be flexible and patient to complete the interviews for all the respondents given the varied industries, backgrounds, and seniority of the positions they held in their respective organizations. Ten of the 12 respondents chose their offices as venues for the interview, while two other interviews occurred at a quiet restaurant.

I used my iPhone to record the interviews. One hour was allocated for each interview, and in each case, participants were made to understand that if needed, there would be a follow-up interview of 30 minutes. Given the difficulty of securing the meeting times, I was fortunate to be able to cover all the interviews in the one hour originally allocated with sufficient and adequate information, and the follow-up 30 minutes were no longer needed. All participants were asked the same questions; however, I asked different follow-up questions to seek further clarification of the responses. The respondents were given ample time to answer questions without any interruptions or pressure of time, and all questions were exhaustively answered in each case.

The 12 interviews occurred over 4 months because of numerous cancellations that at times involved travel to the agreed location only for cancellations to occur at the last minute. In some cases, I had to interrupt various travel to ensure I did not miss scheduled meetings so I could complete the interviews. The audio recordings were transcribed through a paid transcription service and transcripts were shared with the respondents to ensure the responses in the transcript were consistent with their original responses (Janesick, 2011; Lawler et al., 2012). I used the Atlas.ti CASDAQ software to organize and review all the transcripts and prepare them for analysis (Bazeley & Jackson, 2013).

Demographics

This multiple case study involved 12 respondents: two women and 10 men. The two female participants were in the cloud user category in the health sector and the remaining 10 male participants cut across the cloud provider category and the legal and technology companies. The profile of the respondents were all senior management level

or architects who were instrumental in strategic decision-making either as direct decision-makers or contributors to decision-making through recommendations or technology testing and validation. Their unique position as leaders or senior members of their respective organization related to the use of cloud services incorporated difficulty in setting interviews with them.

The three cloud providers are recognizable industry leaders and technology giants and three small companies are cloud users who are in the legal, health and technology industries. The diverse industries and the combination of cloud users and providers is to provide for varied and unique perspectives (Joshi & Knight, 2015). The respondents held different positions, which meant they all had different angles of relating to the cloud adoption decision-making process. There are Executive level management respondents in all the three small businesses, while the cloud providers have senior level technology leaders who are solution architects and leaders in directing technology adoption. Table 1 and 2 contains the demographics of the respondents. This study uses pseudonyms to describe the respondents.

Table 1

Cloud Service Provider Demographics

Name	Gender	Title	Industry
CP1-1	M	Solutions architect–technical delivery manager	Technology
CP1-2	M	Cloud consultant	Technology
CP2-1	M	Cloud security solutions architect	Technology
CP2-1	M	Client executive sales and service	Technology
CP3-1	M	Security infrastructure consultant	Technology
CP3-2	M	Architect	Technology

The cloud provider respondents were invariably technology and solutions architects who test solutions, recommend solutions, help identify the line of business the clients pursued, directly help develop the cloud solutions and features for the cloud users and also help the cloud users to determine what solution best fits their needs. They tended to be more technology practical understanding and understood cloud services much more than the cloud user respondents. Their responses were deep in technology and demonstrated competence in explaining cloud concepts. The cloud users on the other hand were mostly non-technical and even though they appreciated the benefits of cloud computing did not quite understand the vast complexities of cloud computing except for the appreciation of what they used. The cloud users in the technology industry however had deep insight into cloud services and explained it in greater depth than the cloud users in the legal and health industry.

Table 2

Cloud Service User Demographics

Participant	Gender	Title	Industry
HCU-1	F	Administrator	Health
HCU-2	F	Patient services manager	Health
TCU-1	M	CTO and cloud solutions architect	Technology
TCU-2	M	Systems solutions architect	Technology
LCU-1	M	Senior partner	Legal
LCU-2	M	Partner	Legal

The enthusiasm with which the cloud users in the technology industry spoke about cloud services and the depth of knowledge was much more than the non-technology related industries. The respondents in the cloud user category tended to be in the highest echelons of decision-making because they are small companies while the

cloud providers were not at the highest level of decision-making. Long-term strategic decision-making often resides with the C-level executives and the board in the cloud provider organizations while the leadership in the small business cloud users were much more accessible. Thought they all had different levels of relationship with cloud adoption decision-making they all had unique perspectives to share on the subject that deepened the research study.

It was much easier to get interview time with the cloud provider respondents than it was to get with the cloud user respondents. Four out of the six cloud provider respondents were able to meet the first time while it took about two and three times respectively to be able to get interview time with the other two. Two of the cloud provider respondents met at a restaurant while the others met in the office. All the cloud user respondents chose their offices as the venue for the interviews.

Data Collection

The selection process for participants took two months to settle on the twelve participants across the cloud User and cloud provider categories. Through professional relationships and acquaintances, I identified contacts for the partner organizations. A sample letter of cooperation was sent to each of the contacts of the partner organizations, which they used as a template to agree to participate in the research study. The representatives of the partner organizations who signed letters of cooperation sent a request to prospective respondents to contact me if they were interested to send me their letters of consent to participate in the research study. The request to participate in the research contained three sample questions that included: What industry does your

organization belong? What is the primary service or function of your organization? What cloud service does your organization use? I received the letters of consent from the respondents expressing their willingness to participate voluntarily. In all cases, I received the consent forms through email. Some of them shared phone numbers that I could use to contact them.

It took a total of four months to get all twelve respondents to sit down for the interviews. Cloud provider One (CP1) respondents committed to an early schedule and met at their respective offices and conducted the interviews within two weeks of sending their confirmation for the interview. Cloud provider Two (CP2) respondents had travel commitments. However, I was able to meet with one in the office and the other at a restaurant where we met during a quiet time with no interruptions and noise and conducted the interview. Cloud provider Three (CP3) took the longest to arrange the interviews.

It took two and a half months to get both to meet after multiple cancellations, but we finally got the interview with one at a restaurant and the other at the office. In total, two of the interviews occurred at a restaurant, and four of the cloud provider interviews were in the offices. The cloud provider respondents came very prepared and answered the questions in great depth. They all answered the same questions from different angles, but each explained clearly, what their definition of cloud services is how their respective companies use the cloud.

The cloud user category took the longest to arrange the interviews. The technology company was the first to commit to a schedule, and I was able to meet the

solutions architect first, but the Chief Information Officer (CIO) took much longer. Travel commitments and conferences got in the way until I finally sat down with him close to about four months of starting the data collection. They both met me at their offices at different times.

The respondents from the health industry were much less technical and provided what they understood to be cloud services but gave unique perspectives regarding the benefits of cloud computing the rationale for adoption. Similarly, the respondents from the law firm were also less technical but also provided a perspective unique to their specific usage of cloud service. In all the cases, the 1-hour interview provided adequate, all follow-up questions were covered within the same interview, and so there was no need for a follow up 30-minute interview. Table 3 provides a snapshot of when and the duration of the 12 interviews.

Table 3

Interview Dates and Duration

Participant	Date of interview	Duration of interview
CP1-1	7/18/19	45 minutes
CP1-2	7/19/19	50 minutes
CP2-1	7/23/19	40 minutes
CP2-2	7/29/19	54 minutes
CP3-1	9/03/19	1 hour
CP3-2	9/12/19	50 minutes
HCU-1	7/30/19	35 minutes
HCU-2	7/30/19	40 minutes
TCU-1	9/20/19	1 hour
TCU-2	9/24/19	1 hour
LCU-1	8/05/19	40 minutes
LCU-2	8/05/19	42 minutes

The diverse organization types in the study across three specific industries for the cloud users provided unique insights and perspectives that would have been lost by only dealing with one specific industry. The cloud providers also had several use cases and explanations of how they consume cloud services.

All respondents were accorded the same protocol standards and asked the same questions. An iPhone sound recording application was the device for recording and storing voice recordings on an encrypted external drive. Each recording had a different name for ease of identification. The audio recordings were transcribed through an online paid transcription service to produce the transcripts that were edited to remove automatic insertions of time stamps and pauses while maintaining the originality of the responses. The transcripts were shared with respondents for member checking through emails, and each acknowledged the consistency of the transcripts.

All participants explained their understanding of cloud services, the considerations for cloud adoption, the benefits and challenges, the decision-making process as well as if any cloud adoption framework was used in the cloud adoption decision-making process. The cloud providers all alluded to the existence of their respective cloud adoption framework. Each participant assented to the use of the digital recorder to capture the interview, assured of utmost confidentiality and member checking, and briefed on received a summary of the research results.

Data Analysis

Data analysis involved the review, identification of themes, and interpretation of the responses of the twelve participants to the research questions. The questions covered

the profile of the organization, the understanding of cloud services, the decision-making process, and the outcomes of cloud computing. Respondents articulated what they considered the benefits and challenges of cloud computing while at the same time offering their explanations of cloud services. I used an online transcription service to generate the transcripts of the interview, which was analyzed using Atlas ti CASDAQ software was of enormous help in the analysis of the interviews. The respondents received transcripts to ensure member checking before the analysis for consistency.

The audio recordings, interview notes, and transcriptions were stored in an encrypted external drive to protect the data against breach of confidentiality, integrity, and availability. All the transcripts were imported into the CASDAQ for analysis. Codes were created for various elements that were projected in the responses, which were later on categorized under broad themes. Overall there were 402 that were generated across the 12 transcripts. The codes were later on categorized into 25 code groups. The analysis of the transcriptions using the CASDAQ software produced several themes that included Cost Savings, Cloud Security, Competitive Advantage, Skills Availability, Reliability, Efficiency, Regulatory Requirements, Agility, Innovation, Speed to Market, Large Economies of Scale, Ease of Use, Improved Customer Service. The thirteen themes emerged from the data analysis from the CASDAQ software.

The method of analysis for this research is cross-case analysis to identify the unique aspects of each respondent and each organization. The common areas across individuals within an organization, as well as across organizations, were identified. I also identified unique areas within cloud providers and the cloud User categories. The first

analysis was on the transcripts from the cloud providers. My strategy was to read each response first and highlight items I considered interesting. I returned to each of the transcripts and reread them this time, looking for distinct and unique elements from each of the participants, and later on within each cloud provider organization and later on looked for common areas within the respondents in an organization and coded the interesting elements respectively. I repeated the same by looking at distinct themes within an organization, then I looked for commonalities within the same cloud provider and across cloud providers. I repeated the same approach for the cloud Users and looked for distinct elements for each respondent and within an organization and across the cloud user organizations.

Using Atlas ti, CASDAQ, I created the list of the codes and the code groups and exported them into an excel spreadsheet, which was used to pull out the distinct and common elements for the analysis. The codes were both open coding and coding In vivo. The categories in the spreadsheet listed all the codes that fit a particular theme and which made for more straightforward analysis. I consulted the literature review to identify where literature matched the themes and any negative cases.

The dataset that emerged from the export from the CASDAQ codes and code groups provided the foundation for the patterns, trends, and common elements across the cases based on the from spreadsheet data. All these were based on the responses to the twenty questions that were posed to the respondents (Bazeley & Jackson, 2013).

The analysis of the data resulted in the identification of fifteen themes. The synthesis of the themes was done with the decision-making process of cloud adoption in

mind. Items that emerged as interesting but not related to the cloud adoption decision-making were also identified and pointed out as opportunities for future research, which is pointed out in Chapter 5.

Content analysis resulted in the structured arrangement of the themes and patterns (Krippendorff, 2013). Reading through the literature review and the responses revealed saturation of the topics to cover. Many of the topics covered in the literature review emerged from the data. Similar theme groupings also aligned with the conceptual framework and general themes of the literature review (Krippendorff, 2013; Yin, 2014).

Exploring responses and the themes and related inferences led to the emergence of the empirical evidence in the case study. Overall, a positive view of the cloud as a competitive advantage emerged among several other considerations (Aljabre, 2012; Atchison & Palys, 2012).

Participants from each of the cloud provider and cloud user organizations provided their perspectives on the decision-making process of cloud adoption. The criteria for selection of the six respondents was seniority of their positions and the relevance of their position to cloud adoption in their respective organizations. A total of six from the cloud providers and six from the cloud user category.

The analysis in the CAQDAS incorporated the significant themes in the literature review (Humble, 2015). In the analysis, the responses, the literature review, and the conceptual framework are all reviewed as triangulation for ensuring that the research questions are addressed (Krippendorff, 2013).

Strategic decision-making is the conceptual framework of this study. This model asserted that decision-making is a planned activity that requires a thorough assessment of all the variables that go into producing a successful outcome. The strategic decision-making model has four variations, namely managerial autocracy model, systemic bureaucracy model, adaptive planning model, and political expediency. The differences among the models are in the degree and depth of problem familiarization and solution building activities. (Mintzberg et al., 1976).

All the variations of strategic decision-making share the phases of problem familiarization, solution building, decision implementation, organizational learning, and external influences. In this study, I focused on the process of decision-making within the context of three small businesses to explore decision-making processes to adopt cloud services. The analysis of the conceptual approach of a framework was based on identifying successful approaches, understanding, and the outcomes of the cloud adoption and decision-making of the small companies as well as the cloud provider perspectives.

This data analysis involved the development of codes that were used to explore the decision-making processes. The decision-making processes of the small businesses broadly do not align with the exact detailed processes of strategic decision-making as captured in the conceptual framework. The strategic decision-making process is the conceptual framework for the exploration of this research. The research findings add to the body of knowledge for the future decision-making process in cloud adoption by small businesses. The validation of the responses through member checking ensured the

accurateness and intent of the respondents. The participants confirmed the transcripts as accurate responses. Six respondents from cloud users and six from cloud providers.

The participants were coded according to their respective categories – cloud user or cloud provider and their number as a respondent. The codes for analysis were: 1) Cloud provider 1 participant 1 (CP1-1); Cloud provider 1 participant 2 (CP1-2); Cloud provider 2 participant 1 (CP2-1); Cloud provider 2 participant 2 (CP2-2); Cloud provider 3 participant 1 (CP3-1); and Cloud provider 3 participant 2 (CP3-2) for the Cloud providers. For the Cloud Users, the codes were Healthcare Cloud User participant 1 (HCU-1); Healthcare Cloud User participant 2 (HCU-2); Technology Cloud User participant 1 (TCU-1); Technology Cloud User participant 2 (TCU-2); Legal Cloud User participant 1 (LCU-1); and Legal Cloud User participant 2 (LCU-2). All these respondents either in position to affect cloud adoption decision-making users or as people in senior positions in the cloud provider organizations.

Each coding for the industry types, as referred above, are (H) for Healthcare, (L) Legal, and (T) for Technology. Each organization type provides a unique perspective regarding what they use the cloud for, the process of deciding how to use the cloud, the depth of technical appreciation of the features of cloud computing, and how they perceive the value of cloud computing as a competitive advantage. Each cloud user organization had a unique set of requirements and challenges that cloud computing may address. Table 3 contains the decision-making framework of cloud providers and cloud users. Below Table 4 contains the primary usage of cloud computing as opposed to cloud users.

The 13 themes include: a) Cost Savings; b) Security; c) Competitive Advantage; d) Skills Availability; e) Reliability; f) Efficiency; g) Regulatory Requirements; h) Agility; i) Innovation; j) Speed to Market; k) Large Economies of Scale; l)Ease of Use; m) Improved Customer Service. Appendix D contains the summarization of the interviews.

The exploration and synthesis of the strategic decision-making model is the basis of the conceptual framework. This model asserts that decision-making is a planned activity that requires a thorough assessment of all the factors that go into producing a successful outcome. In this case study, I explored how the decision-making process is covering the primary considerations for cloud service adoption, the preparation that goes into the decision to adopt cloud service, the understanding of the service models, the benefits they seek to achieve, and the challenges they plan to mitigate. The decision-makers must understand the full ramifications of cloud services to avoid unforeseen dire consequences. Strategic decision-making is what differentiates a company from the competition (Li & Sujirapinyokul, 2010). The decision-making covered understanding the problem that cloud services solve and the alternatives that exist to address it. The focus was on the process of decision-making within the context of the cloud providers and cloud users. I used purposive selection for the interviewees for this qualitative case study (Yin, 2014) for a thorough exploration of the themes (Atchison & Palys, 2012). The interviews explored the decision-making strategies and the challenges that have to be mitigated. The interview covered the cloud service models that were selected and the competitive advantage they seek to achieve.

The selection of participants was as a result of their relationship with the decision-making process of cloud computing through an invitation that they consented to by filling consent forms. Prospective participants received a form requesting interest in the study. The form contained three sample questions from the research questions, including a) What is the industry does your organization belong? b) What is the primary service or function of your organization?; and c) What cloud service does your organization use? These questions gave a general indication of the interview questions and used to solicit interest to participate.

The conceptual framework was used to guide the selection of the participants by explaining the rationale for choosing the participants, which resulted in the validity of the study. The conceptual framework dealt with the essential components of decision-making, such as understanding the problem, the variables to address the problem, the ramifications of the decision, and the process to make the decision. The conceptual framework formed the basis for the research questions for the interview. The interview transcripts were coded and analyzed to identify the themes from multiple angles, including different industries, different companies, different cloud providers and cloud users to generated triangulated data and for more in-depth analysis into the cloud service adoption decision-making process.

Results from the Overarching Research Question

The overarching research question is, what are the decision-making factors that have contributed to the success of companies adopting cloud services? The analysis of the responses participants in the semi-structured interview revealed emerging themes.

The percentages of the emerging themes that came from the respondents are shown below in

Table 4

Emerging Themes Gathered from the Overarching Research Question

Theme	Referenced
Cost	100%
Security	75%
Competitive advantage	75%
Skills availability	75%
High availability and reliability	75%
Efficiency	75%
Regulatory requirements	58%
Agility	41%
Innovation	41%
Increased speed to market	33%
Large economies of scale	33%
Ease of use	25%
Improved customer service	18%

The factors that affect the successful adoption of cloud services that emerged from the responses cost, security, competitive advantage, skills availability, reliability, efficiency, regulatory requirements, agility, and innovation, increase speed to market, significant economies of scale, ease of use, and improved customer service.

Several factors that affect the success of cloud services emerged from the cloud users and providers. However, cost savings was one of the most mentioned benefits which are already discussed in the literature review. The cost savings are in the initial investment and operational benefit (Alkhater et al., 2014; Koo, & Kim, 2015). Every respondent mentioned cost savings as the primary driver of cloud service adoption.

Participant CP1-1 stated, “Cloud enables IT service to be delivered at lower latency and a better experience for your customers at a minimal cost.” Participant CP1-2 stated, “Generally, there is the lower cost for cloud services versus traditional on-premises.” Participant CP2-1 stated, “There is a departure from the hardware platforms to software-defined services that offer more flexibility and cost savings.” Participant CP2-2 stated, “Cost reduction is also a benefit especially for small to medium size companies.” Participant CP3-1 stated, “Cloud has empowered the business to be innovated and experimenting solutions at scale and a reasonable cost. Cloud provides cost savings.” Participant CP3-2 stated, “Cloud computing reduces the capital expense of buying software and hardware setting up and running on-site datacenters- the racks of servers, the round-the-clock electricity for power and cooling, and the IT experts for managing the infrastructure. It adds up fast.” Participant HCU-1 stated, “Cloud service is cost-efficient.” Participant HCU-2 stated, “Benefit of cloud service is to reduce cost and improve customer service.” Participant TCU-1 stated, “Hosting an application in the cloud removes the extraneous burden of investing in dedicated servers, security systems, backup, and storage hardware. Cloud service reduces the overall setup cost of the application. Deploying an app in the cloud is faster and reduces the overhead on the IT operations department.” Participant TCU-2 stated, “Cloud solves costly infrastructure problems, helps to reduce the size of the IT department, and ability to save on utilities.” Participant LCU-1 stated, “Cost savings since we do not have to install the servers here at the firm.” Participant LCU-2 stated, “We store our documents in the cloud so as not to incur the cost of having a large storage device that we carry around.”

Security was identified by 92% of the respondents as an essential factor for the success of cloud service adoption. Though Security often has the primary challenge of cloud services (Abdellaoui et al., 2016; Baltatescu, 2014; Dhar, 2012). Information security is also a key benefit depending on the size of the organization (Nedelcu et al., 2015). For small and medium-sized companies, security is a significant advantage (Kim & Kim, 2016). Participant CP1-1 started, “Our whole infrastructure is built to satisfy the security requirements for military, global banks, and other high sensitivity organizations. It makes it easier to store data.” Participant CP1-2 stated, “We spend an enormous amount of money in R&D and security solutions that far outpace most companies, and therefore we have a very secure platform.” Participant CP2-1 stated, “Controls are the features that have to exist to mitigate all the security vulnerabilities. It is often not an easy task to implement a generic control when dealing with diverse clients with unique requirements.” Participant CP2-2 stated, “The security requirements can often be expensive to implement, but enterprise cloud providers often take all of that into consideration, therefore, making it easier to meet compliance requirements.” Participant CP3-1, “Because data storage is a shared responsibility between the provider and the consumer. Moreover, cloud security, reliability, and predictive monitoring make a stronger case of trust to store my data.” Participant CP3-2 stated, “Security, the cloud offers a broad set of policies, technologies, and controls that strengthen our security posture overall, helping to protect data, apps, and infrastructure from potential threats.” Participant HCU-2 stated, “Amazon is trustworthy, so I am comfortable that the IT team made the right decision.” Participant TCU-1 stated, “As a consulting company, after

ensuring that our customers have defined their privacy concerned and reviewed all the security risks that may be involved although already mitigated or addressed at 95.9999% by the provider, we present the benefit of storing your data in the cloud versus on-premise." Participant TCU-2 stated "the challenges the business has experienced using cloud-based applications or services are risk of data confidentiality, the level of security that providers offer, upgrade of the tenant without recourse to the impact of our business, a vulnerability in the event of an attack or disaster striking the data farms, and whether the providers comply with statutory regulations. Participant LCU-1 stated, "Worried about the leakage of the data we store in the cloud." Participant LCU-2 stated that cloud services provide "Assured security."

Another factor that was identified by 75% of participants as essential for the success of cloud adoption is training. Training is essential because the recognition phase of a strategic decision-making model requires understanding the concepts of the cloud and the features. Participant CP1-1 stated, "Helping stakeholders understand how to update the staff skills and organizational processes they will need to optimize business value as they move their operations to the cloud." CP1-2 stated, "The more you understand about cloud computing, you realize the attack vectors are reduced, and the chances of human error are also reduced, making much more secure than the on-premises system." Participant CP2-1 stated, "On the job training. Some were formal training offered by the company, and others were third party training." Participant CP2-2 stated, "Training through product launch seminars and workshops." Participant CP2-2 stated, "Skillset gap, bridging the skillset gap from traditional IT mindset to cloud is and was a

challenge to cloud adoption. This challenge is overcome by providing training to the staff." Participant CP3-1 stated, "Training is internal workshops and training." Participant CP3-2 stated, "Internal workshops and training." Participant TCU-1 stated, "Teams learn new processes and tools, but the majority of the existing IT skills are still valid in the cloud." **"**The decision process is based on multiple considerations, including skills availability." Participant TCU-2 stated, "The Company signed employees up for AWS and Azure training both off-site and on-site."

Availability emerged as a theme, with 75% of participants as an important determinant of the success of cloud adoption. The business exists to provide services to the customers, and anything that affects the availability of the service is a critical factor to consider during the adoption of cloud services. The failures of cloud services include security breaches, an outage to the business, a lack of high availability options, and immature policies and procedures (Froehlich, 2015). A key concept in information management is reliability and availability (Alali & Yeh, 2012). Participant CP1-1 stated, "The top considerations of cloud adoption are cost, agility, reliability, and security." Participant CP1-2, "Our organization uses cloud services for business productivity, collaboration among teams, and cloud infrastructure for security and reliability." Participant CP3-1 stated, "Moreover, cloud security, reliability, and predictive monitoring makes a stronger case of trust to store my data." Participant CP3-2 stated, "Global scale, cloud computing runs on data centers around the world, providing overall resiliency and reliability by allowing your data to be backed up in more than one geographic location." Participant HCU-2 stated, "I am not aware of adverse outcomes

except for when our internet is down." This is to underscore the importance of service availability for small businesses. Participant TCU-2 stated, "I oversee monitoring tools to check the availability, health, and stability of these applications by making sure customers both internal and external have 24x7 access to the application." Participant LCU-1 stated, "Except for occasionally having to search for files that took a long time because of internet delays." Participant LCU-2 "Internet delays can sometimes be a bit annoying while waiting for a document to load.

The efficient utilization of resources to achieve business objectives also emerged as 75% of participant responses. Traditional IT service delivery is fraught with the excess use of resources that ends being a waste of unused resources. With cloud service, only what is used is paid for, which makes it more efficient (Aljabre, 2012). Participant CP1-1 stated, "More efficiently develop and manage your applications with nearly unlimited cloud computing resources." Participant CP1-2 stated, "Reduction in cost, increased visibility and interoperability, increased efficiency." Participant CP2-1 expressed the importance of optimum utilization of resources by stating, "Operational efficiencies and risk avoidance." Participant CP3-1 acknowledged the efficiency of cloud service by stating, "it streamlines our IT team to be efficient and innovators." Participant CP3-2 stated, "More efficiently develop and manage your applications with nearly unlimited cloud computing resources…. The internal IT team operates in a collaborative mode (DevOp), which is efficient for the business bottom line." Participant HCU-1 stated, "It is easier, faster and more cost-efficient." Participant TCU-1 stated, "The positive outcome of working with our customers to adopt the cloud can be summed up in these three

words: Flexibility, efficiency and Strategic value." Participant TCU-2, "Our employees can select pre-built tools and features to build solutions tailored towards the business goals and help services our customers faster and efficiently."

Regulatory Requirements emerged as another theme that is important for successful cloud adoption, with 58% of the participants. Specific regulatory issues consist of privileged user access, regulatory data location, data segregation, recovery, investigative support, and long-term viability (Albakri et al., 2014; Rong et al., 2013). Participant CP1-1 stated, "Our whole infrastructure is built to satisfy the security requirements for military, global banks, and other high sensitivity organizations. It makes it easier to store data." Participant CP1-2 stated, "Regulatory requirements or infrastructure implementation requirements may drive them." Participant CP2-1 Legal, Audit and Compliance, and Risk Governance Models. The security requirements can often be expensive to implement, but enterprise cloud providers often take all of that into consideration, therefore, making it easier to meet compliance requirements. Participant CP2-2 in discussing the essential ten areas in cloud adoption framework cited compliance and governance as important by stating "I may miss some of it the domains are Infrastructure, virtualization, automation, customer portal, service catalog, financials, platform and data, applications and analytics, security and compliance and Organization, governance." Participant CP3-2 stated, "Since cloud becomes the destination of business applications, some of the challenges we had to deal with is to go through compliance verification of both the provider and the application stack." Participant TCU-1 stated, "The decision process is based on multiple considerations, including performance,

integration issues, economics, risk tolerance, regulatory compliance considerations, skills availability, and cloud provider landscape." Participant TCU-2 stated, "The challenges the business has experienced using cloud-based applications or services are risk of data confidentiality, the level of security that providers offer, upgrade of the tenant without recourse to the impact of our business, a vulnerability in the event of an attack or disaster striking the data farms, and whether the providers comply with statutory regulations."

Agility and flexibility also emerged as an important consideration for successful cloud adoption by 58% of the respondents. Cloud services offers an organization the ability to streamline processes, increase agility, and maintain strong competitive advantage must be pursued (Akasiadis et al., 2015). It is the ability for companies to make changes on the fly without a lot bureaucracy and hardware restrictions. Participant CP1-1 the cloud allows you to innovate faster because you can focus your valuable IT resources on developing applications that differentiate your business and transform customer experiences rather than managing infrastructure and data centers. Participant CP2-1 stated "That is a departure from the hardware platforms to software defined services that offers more flexibility and cost savings." Participant CP2-2 in describing the primary considerations of cloud adoption stated "speed to market and agility." Participant CP3-1 stated that "Efficiency and agility are important for accelerating time to value and uncovering opportunities for new workloads" Participant CP3-2 stated "Reduction in vendor or technical complexity. Optimization of internal operations. Increasing business agility. Preparing for new technical capabilities. Building new technical capabilities." Participant TCU-1 stated "Cloud platforms provide an unmatched level of flexibility and

enable employees to access systems and data from almost anywhere." Participant TCU-2 stated "Cloud service adoption protects the business against disaster, and also helps to improve corporate agility and flexibility."

Innovation emerged as another important theme from 41% of the respondents. Information technology companies by their nature thrive on innovation and cloud services is a platform that helps companies to achieve quicker results (Cui et al., 2015). Participant CP1-1 stated "innovating at an unmatched pace especially in new areas such as machine learning and artificial intelligence, Internet of Things and server-less computing. With AWS you can take advantage of the latest technologies to innovate, differentiate and deliver solutions fast." Participant CP1-2 stated that cloud services are important because "Increases speed to market and empowers quicker innovation" Participant CP3-1 stated "Cloud has empowered the business to be innovative to experiment solutions at scale and reasonable cost." Participant CP3-2 stated "Innovating and leading is a feature of cloud services. Provide the ability to experiment and innovate. Low barrier of entry and quick time to market. New workloads." Participant TCU-1 stated "It reduces the time needed to go from an idea to a service or app. It facilitates collaboration and innovation, allows analysis of huge amounts of data effectively and give the ability to easily and cost-effectively upscale cloud computing so that the organization can quickly respond to demand. With cloud services."

Speed to Market emerged from 33% of the respondents as an important factor in successful cloud service adoption. When there is an urgent opportunity the cloud provides ready resources to be used to deliver a solution quickly to market. How

companies adopt cloud services may speed up time to market targets and enhance their competitive advantage (Aljabre, 2012). Participant CP1-1 stated “Increases speed to market and empowers quicker innovation.” Participant CP1-2 also stated that cloud services “increases speed to market.” Participant CP2-2 stated “It is the automated platform that allows for quick IT service delivery through self-service, elastic provisioning, metered service and providing the ability for usage of an IT service over internet.” Participant CP3-2 stated “Low barrier of entry and quick time to market.”

Large Economies of Scale is an important fact to consider in cloud adoption. For the cloud provider it the advantage they have to make more resources available for others to pay for. Economies of scale emerged from 33% of the respondents. For the cloud users, they are able to benefit from the economies of scale of the provider for better pricing for metered use. The large economies of scale of big organizations enable them to harness the infrastructure investments to quickly satisfy business demands (Armbrust et al., 2010; Kim, & Kim, 2016). Participant CP1-1 stated the variable expense is much lower than what you can do for yourself because of the larger economies of scale.” Participant CP1-2 stated “As leaders in the industry we have large economies of scale that helps us in our pricing and features in the various service models we have.” Participant CP3-1 stated “This offers several benefits over a single corporate datacenter, including reduced network latency for applications and greater economies of scale. Participant CP3-2 stated cloud services “offer faster innovation, flexible resources, and economies of scale.”

Ease of use emerged with 25% of the participants. Ease of use, and relative advantage is important when adopting a cloud service. (Alemeye, & Getahun, 2015 ;) Participant HCU-2 stated cloud service "Is easy to use and cost effective." Participant TCU-1 stated "Cloud services are designed to provide easy, scalable access to applications, resources and services." Participant LCU-1 stated "Ease of use and cost savings since we do not have to install the servers here at the firm."

Improved Customer Service emerged in 18% from the respondents as an important area in ensuring cloud service adoption. The outcome of cloud services should enhance customer experience. Participant HCU-2 stated "Cloud services adoption leads to improve Customer Service." Participant TCU-1 stated "We provide services and solutions that are relevant, innovative, timely and affordable, while consistently exceeding customers' expectations."

Evidence of Trustworthiness

The trustworthiness of this case study is established in the credibility, transferability, dependability, confirmability, and following ethical procedures in the study.

Credibility

To ensure a credible qualitative inquiry the three main components are rigorous methods, credibility of the researcher and a fundamental appreciation of qualitative inquiry by the researcher (Patton, 2002). The selection of the participants was a rigorous process that was not coerced and done through a consent process across multiple industries, organizations and individuals. Conducting a member check by sending the

transcripts for the participants to review enhanced credibility of the study. The responses were reviewed after each interview, with the interviewee for feedback and accuracy. The participants for accuracy (Harper & Cole, 2012) reviewed the interview transcripts.

The interview was a neutral inquiry by avoiding leading questions and where necessary there was a further probe to establish more in-depth understanding. The triangulation of sources of data in terms of the different industries, companies, different people, different cloud providers and users provided a broad forum to find alternative views and perspectives. Contrary or contradictory cases were captured and reported to enhance the credibility of the research without any interpretations (Kern, 2016; Reynolds et al., 2011). Though cost savings was a perceived benefit, in some cases it was discovered that cloud service actually costs more to use because of uncontrolled use of cloud resources.

The triangulation did not only come from interviewing three cloud service users and three cloud service provider organizations but also included reading literature that was publicly available on some of the organizations especially the cloud providers. The interviews from the sources spanned over four months to provide saturation of the data.

My competence in the subject matter regarding 20 years of experience in the IT industry and several certifications in cloud service provided me the credibility that is required in establishing research quality and reliability (Patton, 2002). I have over 20 years of experience in the IT industry with half of that time in management positions. I have led an enterprise project to implement cloud service in a fortune 500 company successfully. Triangulation of sources and methods to corroborate research findings

ensured that the report was an accurate description and looked from the perspective of the reader (Frankfort-Nachmias, & Nachmias, 2007; Krippendorff, 2013).

I allowed the participants to form their conclusions, remained neutral throughout the interviewing process, and did not act in any way to affect the respondents' outlook one way or the other (Hardin et al., 2014). The avoidance of leading questions and concealing my position on the topics discussed also further enhanced credibility. Using multiple cases by interviewing three different cloud provider organizations and three distinct cloud User organizations is also another way to demonstrate research validity (Yin, 2014).

Transferability

Cloud service providers exist to support multiple industries with their standardized offerings that not uniquely customized to suit any particular organization. The mix of features and cloud services chosen by the health, legal and IT companies slightly varied but the decision-making framework in general for cloud adoption mostly revolve around ease of use, placing data in the hands of a third party, and not having to spend the money to build an infrastructure. The research findings and processes can be transferred to other industries and companies regarding the decision-making process (Stanciu & Petrusel, 2012). The research questions and the interview process provided a replicable outcome as the focus remained on the decision-making process and the considerations for choosing cloud services. With a comparable situation, the outcome was similar because of the semi-structured interview that focused on decision-making process.

Dependability

To produce a dependable study, I kept an audit trail of the activities during the study about where, who, when and what was studied. I kept an audit trail of all the meetings, recorded the interviews for transcription; took copious notes to ensure that in situations where the recording of the interview was not clear, I was able to make cross references. An audit trail as a transparent documentation was essential to minimize bias and enhance accuracy and impartiality. Furthermore, having a triangulation of sources provided a consistent and more in-depth coverage of the subject matter (Kern, 2016; Patton, 2002).

Confirmability

The report on the research data was done in a detailed descriptive manner without any personal interpretation that could give it a different meaning. The essence of the aforementioned was to ensure that if another researcher came behind me, the results would be the same. For confirmability, I created a clear and concise coding method based on the themes and the subjects to enable any researcher to be able to understand the data. The case study protocol detailing all the data collection methods and analysis was prepared for an independent, and objective assessment. The decision-making processes and the considerations emerged from the analysis of the data.

Ethical Procedures

To ensure ethical research study and garner agreements to gain access to participants or data, I got permission from the Institutional Review Board (IRB) and the consent of the participants before interviewing them with informed consent. The

interviewees were under no duress to talk to me and had the flexibility to pick the time and place that suited their schedule for the interview. Interviewees had ample lead-time for all scheduled meetings to enable them to prepare for the meeting. In the event of scheduling conflicts which occurred several times, they participants were given the opportunity to reschedule. If any of the organizations were unable to participate and decided to pull out, another company with a similar size and profile would have been selected.

All the artifacts including informed consent have been stored on an external drive in an encrypted volume and were only be made accessible to those who are directly involved in the study to ensure confidentiality, availability, and integrity of the data. All the participants in the study have been anonymized and pseudo names have been used to mask real identities, but all the actual data has been kept intact without providing obvious clues for the reader to make direct correlations.

The primary repository of the research data is an external drive for periodic back up of the data to Microsoft OneDrive through an encrypted volume to serve as a backup in the event the primary data store becomes unavailable through either damage, theft, or corruption. The data has been stored on the encrypted drive that is accessible only by me to ensure confidentiality. There was no privacy and confidential data that was collected during the interview. For dissemination, the information was sent via email to verified email addresses from me. After the completion of the research, confidential data on the encrypted drive will be deleted.

To avoid conflict of interest, I conducted all research on my own time and not at any time at the expense of any employer. Most of the research work was during the time that I have been self-employed as an entrepreneur. All studies were on my own time at no expense to anyone. There were no incentives for the participants to influence them but I thanked participants and expressed appreciation for their participation in the research. The participants did not reveal any negative and confidential information about their respective organizations.

Study Results

This qualitative multiple case study was an exploration of the decision-making process of small business in cloud service adoption. To ensure greater triangulation, three cloud providers were also interviewed in addition to the three cloud User organizations. Each organization had two participants making 12 participants in all. The 12 participants were all in senior positions who had various levels of involvement in in the decision-making process. Each of the respondents gave responses to the interview questions covering the primary considerations of cloud service adoption, the benefits and challenges in cloud service adoption, the decision-making framework, the highest decision-making authority, the competitive advantage, the negative and positive impact and general understanding of cloud services. Careful analysis of research data included the actual research questions and the responses using the CASDAQ tool Atlat ti. Qualitative coding yielded 13 emerging themes. The research study also covered areas for future research.

Triangulation of responses and their analysis yielded different themes of the considerations and processes for decision-making as well as perceived challenges in the adoption of cloud services. The review of the Cloud Security Alliance white papers added to the triangulation of sources to add to the research findings regarding the important considerations for cloud adoption. The significance of Cloud Security Alliance white paper as an authoritative source on cloud computing studies is that Cloud Security Alliance (CSA) is the world's leading organization dedicated to defining and raising awareness of best practices to help ensure a secure cloud computing environment (Cloud Security Alliance, 2013). In this multiple case study, categories and patterns emerge that provide unique perspectives and worldview that provide new understanding and knowledge (Bazeley & Jackson, 2013).

The research questions identify the decision-making process including the understanding of cloud services, the benefits, the challenges, the competitive advantage and the impact of adoption. The responses offered deeper insights in the study findings. The analysis of the responses from the participants and related literature on decision-making strategy offered a triangulation of sources for the study. The overarching research question was; what are the decision-making factors that have contributed to the success of companies adopting cloud services? The supporting Interview question that helped to answer the overarching research question were: Question 1) what is the industry your organization belong? Question 2) what is the primary service or function of your organization? Question 3) how does your organization use Cloud services? Question 4) Can you describe who performs your internal IT functions? Question 5) Can you describe

the highest decision-making entity in your organization? Question 6) what is your role and title in the organization? Question 7) what are the benefits of cloud based applications to your organization? Question 8) what challenges or drawbacks have you experienced with using cloud based applications Question 9) how does your organization use cloud services? Question 10) How does cloud services enhance your competitive advantage? Question 11) what makes you comfortable to store your data in the cloud? Question 12) what training did you receive to gain a greater understanding of cloud services? Question 13) what were the primary considerations in the decision to go the cloud? Question 14) what was your role in the decision to go to the cloud? Question 15) Describe the formal framework you consulted in the decision-making process. Question 16) what obstacles did you face in the decision to adopt cloud technology? Question 17) what were the unforeseen factors the emerged during the decision-making the process that was not known before? Question 18) what has been the positive outcome of cloud adoption? Question 19) what has been the adverse outcome of cloud adoption? Question 20) what has been the effects of cloud services on the internal IT staff?

Overall, thirteen themes emerged from the responses to the questions concerning the factors that affect the successful adoption of cloud services including 1) cost savings, 2) cloud information security, 3) competitive advantage, 4) skills availability, 5) high availability and reliability, 6) efficiency, 7) regulatory requirements, 8) agility, 9) innovation, 10) increases speed to market, 11) large economies of scale, 12) ease of use, and 13) improved customer service.

Theme 1 emanated from interview questions 7, and 13; theme 2 emerged from questions 8 and 11; theme 3 from questions 7, 10, 13, and 18; theme 4 from questions 20,17, 14, 12, and 8; theme 5 from questions 8, and 19; theme 6 from questions 7, 13, and 18; theme 7 questions 8, 11, 13 and 15; theme 8 from interview questions 8, 10, 11, and 13; theme 9 from questions 6, 7, 10, 13, 15, 18); theme 10 from questions 10, and 13; theme 11 from interview questions 6, 7, and 10; theme 12 from questions 18, 6, 13; and theme 13 from interview questions 10, and 13.

Theme 1: Cost Savings in Cloud Adoption

Cost savings was the one the most mentioned benefits in the literature review. The cost savings are in the initial investment and operational benefits (Alkhater et al., 2014; Koo, & Kim, 2015). Cost savings was mentioned by every respondent as the primary driver of cloud service adoption. The cost savings and the optimum use of resources are compelling benefits (Shi, 2013). The cost savings is not only in the capital expenditure but also in energy savings (Albakri et al., 2014) in analyzing the responses, all respondents cited cost savings as the most important consideration for cloud adoption decision-making. All participants expressed cost savings and that is exemplified in the responses by participant CP1-1 to question 7 who stated, “Cloud allows you to trade capital expense data centers, physical servers, etc., for variable expense and only pay for IT as you consume it. Plus, the variable expense is much lower than what you can do for yourself because of the larger economies of scale.”

Echoing similar sentiment, Participant CP1-2 stated, “Generally lower cost for cloud services vs. traditional on-premises resources, generally more feature rich

functionality and interoperability. The ability to pay for what you use is a very compelling proposition. Participant CP2-2 stated, “Cost reduction is also a benefit especially for small to medium size companies”. Even though the respondent acknowledge the importance of cost, he further asserted that the best benefit is not cost but speed to delivery which is a discrepancy from general consensus from the other participants by stating, “the best benefit I can think of is the speed of delivery.” All other participants mentioned cost as an important factor for cloud adoption in responding to questions 7.

Other participants in responses to Question 13 also stressed the importance of cost savings as factor cloud adoption decision-making process. Participant CP1-1 stated, “The following are the top considerations: cost, agility, reliability and security.” Participant TCU-2 stated, “The primary consideration was lower cost, reliability, scalability, flexibility, security, higher availability, “Participant HCU-1 stated, “Potential cost savings and efficiency.” Participant HCU-2 stated, “To reduce cost and improve customer experience.” This was emphasized by all other participants in responding to the benefits and important considerations for cloud service adoption.”

Notwithstanding the emergence of cost reduction as a benefit of cloud adoption, it however emerged also as a deterrent and a challenge which was an unexpected case. It was identified as a challenge because the ease of adoption often means an abuse of the cloud resources. While it takes time and resources to acquire physical hardware and infrastructure the ease of adoption also means a sprawl of cloud resources which increases cost beyond productivity. In responding to question 8 about the challenges of

cloud service adoption, Participant HCU-1 stated, “Cost can be higher than anticipated.” Participant CP1-1 stated, “Cost increase due to IT Sprawl. Sprawl has to do with the fact that the ease of installing servers often leads to a reckless deployment of servers when they are actually not needed. In the traditional deployments, the lead-time for hardware procurement and installation often discouraged people from installing servers frequently. This is not the case with the cloud since it is relatively easier and so less attention is paid to the potential waste of resources.” Participant CP2-1 stated, “Cost increase was greater than expected, adoption of cloud resources has increased at a greater rate than productivity.” This unexpected negative case highlights the need to understand the challenges of cloud computing before deciding to adopt it. Not fully understanding the operational issues associated with cloud adoption could lead to failure.

Theme 2: Cloud Information Security.

Many companies still have concerns about cloud services adoption as a result of several failures. Failures span multiple domains including mistakes by service providers, exploitation of security flaws by hackers, and immature policies and procedures (AbuKhousa et al., 2012; Froehlich, 2015). The importance of security cannot be overemphasized to ensure protection of customer data. Every care must be taken to put in place processes and technologies to adequately protect the data in the cloud (Sandhu et al., 2010). Because of a very high potential for a data breach, additional mechanisms must be in place to minimize the damage that can ensue (Anjum, 2017).

In responding to Question 8 about privacy concerns in cloud storage, participant CP1-1 stated “Meeting US government compliances and working with federal

government and not meeting requirements. The compliance requirements are strict and we have to make sure our technology works well to meet the requirements, else we are unable to on-board government services, which is a big part of what we do as a company." Participant CP3-2 stated, "Traditional Security Mindset. During cloud adoption, traditional security mindset is always a challenge. Since cloud is quite recent, traditional security teams tend to hold their break and that can derail adoption. Going through cloud security controls with the team always helps move the discussion forward." The respondent further asserted "Data Protection Laws and Privacy concerns. Worried about the leakage of the data we store in the cloud. Storing our documents in the cloud for storage and also as a backup." Participant TCU-2 stated, "The challenges the business has experienced using cloud-based applications or services are risk of data confidentiality, the level of security that providers offer, upgrade of tenant without recourse to the impact of our business, vulnerability in the event of an attack or disaster striking the data farms, and whether the providers are in compliance with statutory regulations."

Question 11 also revealed security as a critical factor in cloud adoption decision-making. Participant CP1-1 stated, "Secure. AWS has been architected to be the most flexible and secure cloud computing environments available to be. Our whole infrastructure is built to satisfy the security requirements for military, global banks and other high sensitivity organizations. It makes it easier to store data." Participant CP1-2 stated, "The more you understand about cloud computing, you realize the attack vectors are reduced and the chances of human error are also reduced, making actually much more

secure than on-premises systems. We spend an enormous amount of money in R&D and security solutions that far outpace most companies and therefore we have a very secure platform.

Participant CP2-2 stated, “Encryption of all data.” Participant CP3-1 stated, “Because data storage is a shared responsibility between the provider and the consumer. Moreover, cloud security, reliability and predictive monitoring makes a stronger case of trust to store my data.” Participant CP3-2 stated, “The cloud is built with Security as foundational. Taking advantage of multi-layered security provided across physical datacenters, infrastructure, and operations with cyber security experts actively monitoring to protect your business assets and data, storing my data was not a hard bargain.” cloud users had confidence in the providers as being fully secure. Participant HCU-1 stated, “It is convenient to use and we do not have any problems with it.” Participant HCU-2 stated, “The cloud provider is trustworthy so I am comfortable that the IT team made the right decision.” Participant LCU-1 stated, “We have confidence in the world class ability of where we host our files.” Participant LCU-2 stated, “Assured security.” Participant TCU-1 stated, “Data saved in the cloud is far more secure than it is on premise. Cloud servers are housed in warehouses offsite and away from most employees, and they are heavily guarded. In addition, the data in those servers is encrypted and replicated across different servers.”

For small and medium-sized companies, security is a significant advantage (Kim, & Kim, 2016) of cloud services because it provides centralization of data, security patches, multi-factor authentication, economy of scale, compliance, and certification,

physical security, reduced cost of security testing, leveraging the skills of the cloud provider (Aljabre, 2012; Gupta et al., 2013; Nedelcu et al., 2015)

Theme 3: Competitive advantage of Cloud Services

When there is an urgent opportunity, cloud services provide ready resources to deliver a solution quickly to meet market demands. How companies adopt cloud services may speed up time to market targets and enhance their competitive advantage (Aljabre, 2012).

Questions 7 elicited a response that describes the competitive advantage of cloud services from Participant CP1-1 stated, “Agility. The cloud allows you to innovate faster because you can focus your valuable IT resources on developing applications that differentiate your business and transform customer experiences rather than managing infrastructure and data centers. Deploy globally in minutes. In discussing competitive advantage as a factor in the decision to adopt cloud services, CP2-1 also stated, “Time to market, operational benefits, risk mitigation, governance and compliance.” Participant CP2-2 stated, “Speed to market. It is the automated platform that allows for quick IT service delivery through self-service, elastic provisioning, metered service and providing the ability for usage of an IT service over internet.

Responses to Question 10 also emphasized the completive advantage of cloud service adoption. Participant CP1-1 stated, “With the cloud you can take advantage of the latest technologies to innovate, differentiate and deliver solutions fast.” Participant CP1-2 stated, “Increases speed to market and empowers quicker innovation. As leaders in the industry we have large economies of scale that helps us in our pricing and features in the

various service models we have. Several participants identified competitive advantage as a reason to adopt cloud services because of time to market and efficiency. Participant CP2-2 stated, “Speed to market.” Participant CP3-1 stated, “Efficiency and agility.IT accelerating time to value.IT as a business enabler.IT uncovering opportunities for new workloads.IT focused on more than “keep the lights on” or upgrades.” Participant HCU-1 stated, “There is no clear competitive advantage for the cloud service we use.”

Participant TCU-1 stated, “Cloud services give enterprises a competitive advantage by providing the most innovative technology available. It reduces the time needed to go from an idea to a service or app. It facilitates collaboration and innovation, allows analysis of huge amounts of data effectively and give the ability to easily and cost-effectively upscale cloud computing so that the organization can quickly respond to demand. Participant TCU-2 stated, “Cloud services puts us at a competitive advantage because our applications are available, stable.”

The ability for the business to instantly share documents, grant customers access to insurance cards, faster premium payment, claims processing and the increase in collaboration between employees and organization.” Participant CP3-1 stated, “Innovation – Cloud has empowered the business to be innovated and experimenting solution at scale and reasonable cost. Cloud has increase efficiency and agility .Cloud provides great cost savings.”

Question 18 also produced responses that addressed the competitive advantage of cloud service adoption. Participant HCU-1 stated, “It has improved customer experience on our website.” Participant TCU-2 stated, “Cloud adoption by the company has helped

increased sales and revenue and helps the company achieve its targeted goals. The company also saves on building its own infrastructure as cloud adoption services takes care of infrastructure."

Though the participants identified cloud services adoption as a competitive advantage in cloud service adoption, there was a discrepancy finding in the response of Participant LCU-1 who in responding to whether there is a competitive advantage stated, "No discernible benefits for us as lawyers."

Theme 4: Skills Availability and Training

Cloud has emerged as a disruptive technology that has several advertised benefits. However, the skillsets required to support the migration of applications and operate the cloud infrastructure is not as prevalent as traditional IT skills. Organizations must build the capacity to support cloud operations as well the capacity to understand the cloud features and service models to make the right decisions. For small and medium-sized companies, cloud is compelling (Kim, & Kim, 2016) because it provides centralization of data, the ability to leverage the skills of the cloud provider since the skills needed to build a cloud infrastructure (Aljabre, 2012; Gupta et al., 2013; Nedelcu et al.) The skills are not only needed in supporting the cloud infrastructure but also in the decision-making process to make the right choices.

In a response to question 8 participant CP1-2 stated, "The biggest challenge is the shift in culture as it pertains to operations." CP3-1 stated, "Skillset gap, bridging the skillset gap from traditional IT mindset to cloud is and was a challenge to cloud adoption. This challenge is overcome by providing training to the staff."

Question 12 also revealed thoughts about the forms of training in cloud service adoption. Participant CP1-1 stated the source of training as, “Internal trainings, decision-making strategy of cloud service.” Participant CP1-2 stated, “Internal training (in person and online), cloud academy websites. CP2-1 stated, “On the job Training. Some were formal trainings offered by the company and others were third party training.” Participant CP3-1 stated, “Workshops and focused discussions with industrial expects.” Participant CP3-2 stated, “Internal workshops and trainings. Decision-making strategy of cloud service.” Participant TCU-1 stated, “With a team of professional with strong background on traditional and on premise IT infrastructure and deployment, the learning curve to the cloud was mostly focused on understanding the functionality available to deliver the same solutions used on premise. The team has various types of training both on-demand web based and also on-site training.” Participant TCU-2 stated, “The Company signed employees up for AWS and Azure training both off site and on-site.”

In Question 14, the participants discussed how cloud service training is directly used in the decision-making process either in the adoption directly or in guiding others to adopt cloud services. Participant CP1-1 stated, “Participating in workshops, assessments, and providing recommendations.” Participant CP1-2 stated, “Individual Contributor as a member on a team that researches and validates new solutions. CP2-1 stated, his role with skills is “Recommendation to clients regarding what cloud offerings will best suit them especially in situations where there is limited knowledge within the organization to support the technology.” Participant CP3-1 stated, “As a solution architect, I played an active role is reviewing application architectures, doing technical and business value

analysis, led cloud adoption workshops." Participant CP3-2 stated, "Doing application assessment and providing feedback to the cloud adoption steering team."

Question 17 responses also highlighted the theme on skills availability and its importance in cloud adoption decision-making. Participant CP1-2 stated, "How users would react to change. Technology is usually a known quantity but the people part is always hard to predict." Participant CP3-1 stated, "The rapid changing nature of cloud services – the cloud eco system is ever changing and there is an expectation to keep up with it, this challenge was not accounted for earlier." Participant TCU-1 stated, "The complexity of choices and features that we had to navigate to settle on design choices. I am referring to the difference options that are available on the cloud portal. One has to understand what each options does and if it addresses our requirements. Having to review all the features and comparing them with what we wanted took much longer and more effort than we expected."

Question 20 responses provided a perspective on the difficulties in cloud adoption decision-making with limited skills, training and knowledge. Participant TCU-1 stated, "The complexity of choices and features that we had to navigate to settle on design choices. I am referring to the difference options that are available on the cloud portal. One has to understand what each options does and if it addresses our requirements. Having to review all the features and comparing them with what we wanted took much longer and more effort than we expected."

Notwithstanding the necessity of training as a critical ingredient in the cloud service adoption, some participants stated the shortage of the skills because of lack of

training. In question 12, Participant CP2-2 stated, “There has not been any formal training except through product launch seminars and workshops.” Participant HCU-1, Participant HCU-2 Participant CP1-1, Participant LCU-1, and Participant LCU-2 all stated, there had been no training in cloud service training.

Not using a formal cloud adoption framework in the decision-making process requires that the decision-makers must have a deep understanding on the cloud services, the various service models, the benefits and challenges to be able to make an effective decision. Cloud service users and providers alike must continue to educate themselves to understand the evolving and challenging landscape of the technology. Though the cloud providers generally provided training to those who are involved in the decision-making and providing guidance, the cloud users have limited exposure to formal cloud service training with the exception of the cloud service user that is in the technology industry who offered training to the internal staff. This underscores the fact that the core competency of the other organizations that fell outside the technology industry meant little exposure to cloud service training. Table 5 contains the highest level of cloud adoption decision-making and table 6 includes the primary challenge of the participants as providers and as users.

Table 5

Cloud Knowledge Training for Cloud providers

Respondent	Cloud adoption framework
CP1-1	Cloud academy websites, internal formal training
CP1-2	Internal training and online training
CP2-1	Formal internal company training, third party training
CP2-2	Product launch seminars and workshops, no formal training
CP3-1	Internal training and workshops

CP3-2	Internal training

Table 6

Cloud Knowledge Training for Cloud Users

Respondent	Cloud adoption framework
HCU-1	No training
HCU-2	No training
TCU-1	On-demand-web based training and on-site training
TCU-2	Web-based training and on-site training
LCU-1	No training
LCU-2	No training

TCU-1 response to a question about formal training stated, “With a team of professionals with a strong background on tradition and on-premise IT infrastructure and deployment, the learning curve to the cloud was mostly focused on understanding the functionality available to deliver the same solutions used on-premise. The team has various types of training, both on-demand web-based and on-site training.” Having a limited understanding of cloud technology and services can affect the decision-making process as described by the Strategic Decision-making Model as highlighted by CPU1-1 stated: “The more you understand about cloud computing, you realize the attack vectors are reduced, and the changes of human error are reduced, making actually much more secure than on-premise systems.”

The strategic decision-making requires a deliberate process to understand the problem that cloud adoption seeks to address, review the options, and make an effective selection. Going through such a process requires a framework. The cloud providers are more mature and use cloud adoption framework, which they have published for the public to use, but in this study, though the cloud providers use cloud adoption

frameworks and expect consumers to do same, the cloud Users in this study did not consult any framework as shown in Tables 3 and Table 4. Table 7 includes the primary benefit of cloud computing by both cloud users and cloud providers. Table 8 below includes the type of training received by the respondents in the cloud provider and cloud user organizations.

Table 7

Decision-Making Framework by Cloud providers

Respondent	Cloud adoption framework
CP1-1	AWS cloud adoption framework (AWSCAF)
CP1-2	AWS cloud adoption framework, (AWSCAF)
CP2-1	Cisco domain ten
CP2-2	Cisco domain ten
CP3-1	Set of strategic questions (not familiar with a formal framework)
CP3-2	The Microsoft cloud adoption framework for azure

Table 8

Decision-Making Framework Adopted by Cloud Users

Respondent	Cloud adoption framework
HCU-1	None
HCU-2	None
TCU-1	None (consulted cloud provider for guidance)
TCU-2	None
LCU-1	None (used personal knowledge)
LCU-2	None

Not having adequate training means the decision-making process may lack useful information in the selection of cloud service models. The decision-making may be impacted due to a lack of understanding of the variables involved on the part of the small businesses.

The strategic decision-making model is built on the foundation that there has to be a trigger for decision-making, which means the cloud adoption process must begin with the appreciation of the value proposition. The benefits of cloud computing are varied, and several of them emerged from the responses. There are, however, prominent ones that emerged across the cloud Users and cloud providers.

Theme 5: High Availability and Reliability

The failures of cloud services include security breaches, an outage to the business, a lack of high availability options, and immature policies and procedures (Froehlich, 2015). IT services that are no longer in the control of the organization must be guaranteed within a service level agreement expected uptime for the consumers of the business services. A key concept in information management is reliability and availability (Alali & Yeh, 2012). When the connectivity to the cloud provider is severed, the entire IT service that is hosted in the cloud becomes unavailable and beyond the control of the cloud user.

Question 8 was about the challenges of adopting cloud services. The responses were about the times when interruption to cloud service availability was an issue. Participant CP2-2 stated, “Various disruptions of service from time to time. The disruptions are sometimes as a result of network outages and operational difficulties in managing applications.” Participant HCU-1 stated, “Costs can be higher than anticipated. Also, we can experience network bottlenecks on the cloud service.” Participant HCU-2 stated, “When the internet goes down, it affects the service.” Participant LCU-2 stated, “Internet delays can sometimes be a bit annoying while waiting for a document to load.” Participant TCU-1 stated, “Although the common benefits are Downtime.”

Question 19 was about the adverse impacts of cloud services. The responses also highlighted service availability as an issue. Participant HCU-2 stated, “I am not aware of adverse outcomes except for when our internet is down.” Participant LCU-1 stated, “When we do not have internet access, it can be frustrating, but thankfully that has happened on very few occasions.” Participant LCU-2 stated, “ I sometimes wonder what will happen if the cloud also goes offline. But so far, so good.” Participant TCU-1 stated, “There has not been an adverse outcome with the exception of internet outages that sometimes affect our access to the cloud services. We are looking into alternative telecommunication provider options to ensure high availability of the internet connection.”

Theme 6: Efficiency

Cloud services have emerged as an enabler for companies of all sizes to achieve their objectives efficiently and cost-effectively. The ability of the organization to sustain the use of cloud services depends on how they are able to use cloud resources and save cost-efficiently. Cloud services are changing organizations through the efficient utilization of resources, thereby saving money (Zhang et al., 2010). Traditional IT requires enormous resources to deliver IT services. Cloud computing, on the other hand, provides the platform for fewer resources and time to be used for IT service delivery.

Question 7 responses highlight the efficiency that cloud services provide. In discussing how cloud computing leads to efficiency, Participant CP1-1 stated, “With the cloud, you can easily deploy your application in multiple physical locations around the world with just a few clicks.” Participant CP3-2 stated, “The cloud allows businesses to

access the computer resources they need in real-time to match their business needs on-demand and more efficiently develop and manage your applications with nearly unlimited cloud computing resources." TCU-2 stated, "The business benefited tremendously moving to the cloud-based services. Our employees can select pre-built tools and features to build solutions tailored towards the business goals and help services our customers faster and efficiently."

Question 13 also elicited responses that highlighted efficiencies in cloud service adoption. Participant CP2-1 stated, "Operational efficiencies and risk avoidance." Participant HCU-1 stated, "Potential cost savings and efficiency." Similar expressions were in the responses to Question 18. Participant CP1-2 stated, "Reduction in cost, increased visibility and interoperability, increased efficiency." While Participant CP3-1 stated, "Cloud has empowered the business to be an innovative and experimenting solution at scale and reasonable cost. Cloud has increased efficiency."

Theme 7: Regulatory Requirements and Compliance Requirements

Regulatory Requirements emerged as another theme that is important for successful cloud adoption. Specific regulatory issues consist of privileged user access, regulatory data location, data segregation, recovery, investigative support, and long-term viability (Albakri et al., 2014; Rong et al., 2013).

Question 8 covered security requirements, and the responses highlighted the need to take compliance and regulatory requirements into account for cloud service adoption decision-making. Participant CP3-2 stated, "Since cloud becomes the destination of business applications, some of the challenges we had to deal with is to go through

compliance verification of both the provider and the application stack." TCU-2 stated, "The challenges the business has experienced using cloud-based applications or services are risk of data confidentiality, the level of security that providers offer, upgrade of the tenant without recourse to the impact of our business, a vulnerability in the event of an attack or disaster striking the data farms, and whether the providers are in compliance with statutory regulations."

In addressing Question 11 about what makes an organization store data in the cloud, participant CP1-1 stated, "Our whole infrastructure is built to satisfy the security requirements for military, global banks, and other high sensitivity organizations. It makes it easier to store data." Participant CP2-1 also states, "Legal, Audit and Compliance and Risk Governance Models. The security requirements can often be expensive to implement, but enterprise cloud providers often take all of that into consideration, therefore, making it easier to meet compliance requirements. In question 13, participant TCU-1 stated: "The decision process is based on multiple considerations, including performance, integration issues, economics, risk tolerance, regulatory compliance considerations, skills availability, and cloud provider landscape." Emphasizing the need to take regulatory requirements into account in cloud adoption, participant CP1-2 stated: "Regulatory requirements or infrastructure implementation requirements may drive them."

Question 15 also elicited responses that highlighted compliance requirements. Participant CP2-2 in discussing the essential ten areas in cloud adoption framework cited compliance and governance as important by stating "The ten domains in the adoption

framework are Infrastructure, virtualization, automation, customer portal, service catalog, financials, platform and data, applications and analytics, security and compliance and Organization, governance."

Theme 8: Agility and Flexibility

The ability of an organization to make changes quickly to respond to changing mark needs is agility. Cloud services offer an organization the ability to streamline processes, increase agility, faster adoption of new technology, eliminate waste, reduce cost, maximize profit, create and maintain strong competitive advantage must be pursued (Alkhalil et al., 2017; Vasiljeva et al., 2017).

In Questions 11 and 13, the respondents discussed the flexibility and agility that cloud services provide businesses. Participant TCU-1 in responding to Question 11, he stated, "The positive outcome of working with our customers to adopt the cloud can be summed up in these three words: Flexibility, efficiency and Strategic value." The response to Question 13 by participant CP1-1 stated, "Agility. The cloud allows you to innovate faster because you can focus your valuable IT resources on developing applications that differentiate your business and transform customer experiences rather than managing infrastructure and data centers. Deploy globally in minutes." Participant CP3-1 stated, "Efficiency and agility. IT is accelerating time to value. "Participant TCU-2 stated, "Cloud protects the business against disaster, and also helps to improve corporate agility and flexibility." Participant CP2-2 stated, "Speed to market, agility." Participant CP3-2 stated, "Cost savings. Reduction in the vendor or technical complexity.

Optimization of internal operations. Increasing business agility. Preparing for new technical capabilities. Building new technical capabilities."

Theme 9: Innovation

Information technology companies, by their nature, thrive on innovation, and cloud services is a platform that helps companies to achieve quicker results (Cui et al., 2015). Businesses thrive on the ability to adapt to changing market conditions and come up with new and compelling ideas and products to gain an advantage over competitors. Efforts to innovate are no longer inhibited by the readily available hardware and software to test new ideas. Cloud provides features and technologies at the disposal of cloud users that enables them to provide innovative solutions that they would otherwise not be able to access. Participants in answering questions 6, 7, 10, 13, 15, and 18 all stated in various ways the opportunities for innovation that cloud services provide. Participant CP3-2 stated, "Simply put, cloud computing is the delivery of computing services—including servers, storage, databases, networking, software, analytics, and intelligence—over the Internet ("the cloud") to offer faster innovation." Participant CP1-1 stated, "The cloud allows you to innovate faster because you can focus your valuable IT resources on developing applications that differentiate your business and transform customer experiences rather than managing infrastructure and data centers."

In responding to question 10 regarding opportunities that cloud services provide companies to excel, a clear response that articulates the features of cloud that enables innovation was given by Participant CP1-1 when he stated, "The cloud allows you to innovate faster because you can focus your valuable IT resources on developing

applications that differentiate your business and transform customer experiences rather than managing infrastructure and data centers." In describing the features available in the cloud for innovation, the participant went to say, the cloud they have chosen "has significantly more services and more features within those services than any other cloud provider. The fast pace of innovation. The cloud provider released 1,957 new services and features, innovating at an unmatched pace, especially in new areas such as machine learning and artificial intelligence, Internet of Things, and server-less computing. With AWS, you can take advantage of the latest technologies to innovate, differentiate, and deliver solutions fast."

Several of the participants made the same point in their responses to questions 13, 15, and 18 regarding the innovation that the cloud provides. Participant CP3-2 stated, "Innovating and leading. Provide the ability to experiment and innovate. Low barrier of entry and quick time to market" One of the critical questions that cloud providers ask when a cloud User is in the process of deciding to cloud services in their framework is to find out if they want to innovate. This point was made by Participant CP3-1 when he stated, "The following strategic questions for part of the framework used in decision-making. Where are our opportunities to innovate and differentiate?" Participant CP3-1 stated, "Innovation – Cloud has empowered the business to be innovated and experimenting solution at scale and reasonable cost.

Theme 10: Increased Speed to Market

How companies adapt, cloud services may speed up time to market targets and enhance their competitive advantage (Aljabre, 2012). In a rapidly changing market

landscape, it is not enough to out-innovate the competition but come up with a working product or service that enables the business to enjoy early market entry. Cloud services provide the platform for ready market entry or near ready platform that does not take time to configure and set up as opposed to traditional IT service delivery.

This was expressed in the responses to question 10 by respective participants. Participant CP1-2 stated, “Cloud increases speed to market and empowers quicker innovation. As leaders in the industry, we have large economies of scale that help us in our pricing and features in the various service models we have. Participant CP2-2 and CP3-2 both echoed speed to market as a driver for cloud service adoption. Participant TCU-1 stated, “It reduces the time needed to go from an idea to a service or app. It facilitates collaboration and innovation, allows analysis of huge amounts of data effectively and gives the ability to easily and cost-effectively upscale cloud computing so that the organization can quickly respond to demand” In responding to question 13, Participant CP2-2 stated, “Speed to market” is an important factor to consider in cloud adoption decision-making.

Theme 10: Large Economies of Scale

Large Economies of Scale is an important fact to consider in cloud adoption. For the cloud provider, the advantage they have to make more resources available for others to purchase. The large economies of scale of big organizations enable them to harness the infrastructure investments to quickly satisfy business demands (Armbrust et al., 2010; Kim, & Kim, 2016). For small organizations, the lack of economies of scale also means

they can save costs by purchasing from the optimized cloud services offered by cloud providers who have large economies of scale.

In responding to question 6, CP3-1 stated, “It is the delivery of computing services such as servers, storage, databases, networking, software, analytics, and intelligence over the Internet flexibility and economies of scale. Participant CP3-2 stated, “Simply put, cloud computing is the delivery of computing services—including servers, storage, databases, networking, software, analytics, and intelligence—over the Internet (“the cloud”) to offer faster innovation, flexible resources, and economies of scale.” The economies of scale enable both the cloud providers and users to set and enjoy lower prices, respectively. Participant CP1-1 stated, “The variable expense is much lower than what you can do for yourself because of the larger economies of scale.” This was repeated in response to question 7 by Participant CP3-1, who stated cloud “offers several benefits over a single corporate datacenter, including reduced network latency for applications and greater economies of scale.”

In another response to question 10, the effect of economies of scale on pricing was reechoed by CP1-2, who stated, “Increases speed to market and empowers quicker innovation. As leaders in the industry, we have large economies of scale that help us in our pricing and features in the various service models we have.”

Theme 11: Ease of Use

Though there are several complex cloud infrastructure implementations, there are several cloud service offerings that are ready and easy to use. This makes the adoption much more simple and successful without a steep learning curve. The ease of use of

cloud services was emphasized by participants, LCU-2, and participant HCU-2 in responding to question 18, who both stated that cloud service enables easy access to files in the cloud. Responding to question 6, Participant TCU-1 stated, “Cloud services refer to any IT services that are provisioned and accessed from a cloud computing provider. Cloud services are designed to provide easy, scalable access to applications, resources, and services.” This was also agreed to by participant LCU-1, who, in describing the positive impacts of cloud services, stated, “Ease of use and storage.”

Theme 13: Improved Customer Service

Having a streamlined IT operation means systems deployed faster and optimized quicker for customer satisfaction. The ability of companies to sustain customers lies in making sure that IT systems are continually running with minimal interruptions and remain robust and secure. The point of cloud services impacting customer service was expressed by participant TCU-1 in responding to question 10 in stating that, “We provide services and solutions that are relevant, innovative, timely and affordable, while consistently exceeding customers’ expectations.” In a more direct expression, in response to question 13, Participant HCU-2 stated: “Benefit of cloud service is to reduce cost and improve customer service.”

Other essential benefits were identified as the triggers for the decision to adopt cloud services. These benefits included ability to experiment and innovate; Access to files from everywhere; advanced security; agility; Application Programming Interfaces (APIs); Speed of Delivery; Better experience for your customers; Business Value is placed above Technology implementation; deliver services to market quickly; Deploy

globally in minutes; Divert focus from infrastructure to more customer improving activities; Easy to use; Efficiency; enhanced productivity; Enhanced reliability; Faster web portal; feature-rich functionality; Elasticity; flexibility; governance and compliance; helped increased sales; improved our work the office; increased mobility; Increased productivity; increased visibility; Innovation; interoperability; larger economies of scale; Low barrier of entry and quick time to market; lower latency; metered pay as you go; multiple physical locations; on-demand; only pay for IT as you consume it; overall resiliency and reliability; Performance; real-time to match their business needs; reliability; risk mitigation, and scalability.

Understanding the benefits and challenges of cloud service is essential to mitigate losses in cloud adoption (Sohaib & Naderpour, 2017). The challenges of cloud service adoption are captured from the respondents in Table 9.

Table 9

Challenges of Cloud Services

Respondent	Cloud provider	Cloud Uuser
CP1-1	Meeting government compliance requirements	
CP1-2	Culture shift, technical uncertainty, and uncertain career future.	
CP2-1	Cost increase, it sprawl, loss of visibility, loss of logging and operational control.	
CP2-2	Service disruptions; operational difficulties in managing applications in the cloud.	
CP3-1	Skillset gaps; application compatibility; change in mindset; the rapid pace of change.	
CP3-2	Preparing minds to embrace the change; compliance requirements; information security threat;	
HCU-1		Network outages affect the service;
HCU-2		Internet outage impact;
TCU-1		Downtime, cost management, security, service provider reliability, data privacy, vendor-lock-in
TCU-2		Changing mindset, security scare because of loss of visibility, unknown storage location.
LCU-1		Internet outages and delays affect file searches; data protection laws and privacy concerns;
LCU-2		Internet delays;

While the challenges of the cloud providers were most challenging, the focus for the small businesses tended to focus on the loss of connectivity and network outages since the complex challenges are generally left to their respective providers to manage. The concept of service accessibility is critical in all cloud adoption discussions (Armbrust et al., 2010). Network outages means they are unable to do their work which is in the cloud and they do no not have adequate infrastructure on-premises as a fall back mechanism to continue to work. The general understanding of the challenges may help alleviate the burden with carefully planned mitigation strategies (Sohaib & Naderpour, 2017).

Management has often rushed to adopt cloud services because of the advertised benefits (Kim & Kim, 2016) without the requisite due diligence and thorough assessment of the ramifications before choosing the appropriate service or deployment model (Armbrust et al., 2010; Wang et al., 2014). A full grasp of the risks and potential negative consequences of cloud adoption is critical to identify effective mitigating strategies before proceeding to select a solution for implementation (Sohaib & Naderpour, 2017).

Meeting compliance requirements of laws and regulations is also a challenge of cloud services (Albakri et al., 2014). Compliance emerged as one of the challenges in the participant responses. Meeting strict requirements is difficult when the organization has limited control over the cloud infrastructure. Therefore, it requires meticulous collaboration with the cloud service provider to ensure that standards are to avoid penalties (Alosaimi et al., 2017).

Having a good understanding comes from training or using a cloud adoption framework that provides a roadmap that enhances success in cloud adoption. Before adopting cloud services, there has to be a process to evaluate options before the selection. Various considerations were captured from the responses as necessary before cloud adoption. Table 10 contains the participant assessment of cloud service adoption.

Table 10

Cloud Service Adoption Considerations

Respondent	Cloud provider	Cloud user
CP1-1	Cost, agility, reliability, and security.	
CP1-2	Lower cost, regulatory requirements; infrastructure requirements.	
CP2-1	Operational efficiencies and risk avoidance	
CP2-2	Speed to market, agility.	
CP3-1	Information security, cost saving benefits, agility and innovate.	
CP3-2	Cost savings. Reduction in the vendor or technical complexity. Optimization of internal operations. We are increasing business agility. Preparing for new technical capabilities. Building new technical capabilities;	
HCU-1		Potential cost savings and efficiency.
HCU-2		To reduce cost and improve customer experience
TCU-1		Performance, integration issues, cost, risk tolerance, regulatory compliance considerations, skills availability, and cloud provider landscape
TCU-2		Lower cost, reliability, scalability, flexibility, security, higher availability.
LCU-1		Ease of use and storage;
LCU-2		Constant access to work files;

All the participants pointed to various factors they consider when deciding to adopt cloud computing without necessarily using a cloud adoption framework even though the cloud providers generally use a cloud adoption framework. The decision-making process is, however, much more complex than just a list of factors. The respondents in the study, though they play various roles in the cloud adoption because of their respective positions, have different interactions with the decision-making process. Their roles range from being the highest decision-maker to being a technology expert in the process. The highest decision-makers in the respondent organizations were varied, and table 11 shows the highest decision-making position juxtaposed with the level and role of respondents.

Table 11

Decision-Making and Roles of Respondents by Cloud providers

Respondent	Title	Role in cloud adoption decision-making.
CP1-1	Architect	Responsible for testing cloud technologies and features that are adopted by users.
CP1-2	Security infrastructure consultant	Responsible for ensuring information security best practices in cloud adoption.
CP2-1	Security solutions architect	Responsible for working with clients to determine the appropriate cloud service solutions.
CP2-2	Client executive, sales & service	Responsible for matching the client needs with a long list of cloud offerings and develop roadmap for cloud adoption.
CP3-1	Solutions architect (technical delivery manager)	Provides guidance in cloud solutions and adoption.

CP3-2	Cloud consultant	responsible for providing technology directions and road map for cloud solutions and adoption.

Though overall strategic decision-making is done at the executive level some of the technical details and features of the cloud solutions are handled by senior technical teams and solutions architects who oversee the development of the product offerings and the interactions with the cloud users. The proliferation of information system infrastructures throughout organizations has created a platform for decentralized decision-making that can be harnessed in the strategic decision-making of an organization (Henfridsson & Lind, 2014). The focus of the study is cloud adoption from the perspective of small businesses about what the cloud provider is offering. The provider's perspective is one of what and how the products would be adopted, but the cloud Users should have a good understanding of what offering and solutions are as well as having an understanding of all the ramifications of the decision-making that a cloud service offering. Table 12 below shows the levels of decision-making and the various roles in cloud adoption by cloud Users.

Table 12

Titles and Decision-Making Roles of Cloud Users Respondents

Respondent	Title	Role in cloud adoption decision-making.
HCU-1	Executive administrator	Responsible for the administration of the medical practice.
HCU-2	Patient services manager	Responsible for customer service and operations.
TCU-1	Chief technology officer (CTO)	Highest decision-maker on technology solutions and adoptions. Responsible for cloud solutions adoption and architecture.
TCU-2	Senior systems solutions architect	A senior technology decision-maker working closely with management to adopt and operate technologies.
LCU-1	Managing partner	The highest decision-maker in the law firm. Makes final decisions on all matters including cloud adoption.
LCU-2	Senior partner	Second in command at law firm working closely with managing partner on strategic decisions affecting the law firm.

The profile of the cloud users are mostly executive level personnel who make strategic decisions. Their level of understanding of cloud services are generally limited compared to the provider but their decisions have far-reaching impact on the entire organizations. In smaller organizations with limited staff the executive leadership tend to take on more decisions that would otherwise be handled by a robust and competent technical staff so where the technical understanding is limited it could affect the decision-making.

The list of cloud offerings and services is varied. Table 13 shows how the cloud service providers offer and what the cloud users understand cloud services to mean.

Table 13

List of Cloud provider Services and Services Adopted by Cloud Users

Respondent	Cloud provider offerings	Cloud services known to cloud user
CP1-1	Infrastructure-as-a-service, platform-as-a-service, software-as-a-service and all the other cloud offerings we provide to our customer	
CP1-2	Business productivity, collaboration among teams, and cloud infrastructure for security and reliability. IaaS (infrastructure as a service), PaaS (platform as a service), SaaS (software as a service	
CP2-1	IaaS (infrastructure as a service), PaaS (platform as a service), SaaS (software as a service), security, collaboration, data center, software defined access, identity, applications, access management	
CP2-2	Integrations with other cloud providers such as cisco hybrid solution for Kubernetes on AWS, cisco hybrid cloud platform for google cloud, cisco integrated system for Microsoft azure stack, and sap data hub on cisco container platform. Application centric infrastructure (ACI) anywhere: ACI cloud, cisco cloud services router 1000v, Meraki VMX and other solutions. Security, analytics, and cloud applications such as cisco webex meetings cisco webex team.	
CP3-1	Computing services such as servers, storage, databases, networking, software, analytics, and intelligence over the internet flexibility and economies of scale.	
CP3-2	Computing services—including servers, storage, databases, and networking, software, analytics, and intelligence capabilities.	

HCU-1	Amazon web portal
HCU-2	Patient portal
TCU-1	Cloud service platforms for applications, compute, network, data, and business intelligence provided by the cloud providers.
TCU-2	AWS SaaS offering and azure PaaS & IaaS models.
LCU-1	One drive cloud storage;
LCU-2	cloud storage;

The cloud users procure specific offerings, and without adequate training, their knowledge ofc the features are limited. Their understanding of cloud services is limited to only the services they consume. The definition of the small businesses of cloud service is, therefore, much narrower than the vast array of cloud services. In Table 14 the participants assessment of cloud service adoption is described by outlining both the negative and positive outcomes.

Table 14

Participant Assessment of Cloud Service Adoption.

	Positive outcomes	Negative outcomes
CP1-1	IT alignment with business	None
CP1-2	Reduction in cost, increased visibility and interoperability, increased efficiency	Minor impact regarding some internal staff not able to keep pace with rapid cloud adoption.
CP2-1	Time to market and respond to business has improved from months to days	Cost increase has outpaced productivity increase
CP2-2	Agility & enhanced productivity.	Increased spend
CP3-1	Innovation, increased efficiency, and agility and significant cost savings	None
CP3-2	Cost savings. Complexity reduction in the vendor or technical designs. Optimization of internal operations. Increasing business agility. Building new technical capabilities	None
HCU-1	Improved customer experience	None
HCU-2	Faster web portal and it has improved work in the office	Internet outage impact
TCU-1	Flexibility, efficiency, and strategic value	Internet outages
TCU-2	Increased sales, revenue, and saves cost.	Network downtime, security and privacy risks, limited control and flexibility
LCU-1	Access to files from anywhere	Internet access disconnections impact.
LCU-2	Easy access to files	None

Table 15 describes the emergent themes from the synthesis of the primary data.

Table 15 provides a description and the alignment with the conceptual framework.

Table 15

Emergent Themes from the Synthesis of the Data

Themes	Description	Alignment with conceptual framework
Level of understanding of cloud service	Understanding of cloud services	Selection, judgment analysis, bargaining.
Benefits of cloud services.	The positive outcomes and expectations of cloud services adoption	Identification, recognition
Challenges and drawbacks	The negative outcomes and challenges that cloud providers and users face in cloud adoption	Identification phase, diagnosis
Cloud security	Privacy and security issues	Identification, diagnosis
competitive advantage	The factors that provide a competitive advantage	Identification, diagnosis
Internal IT staff impact	Impact on the internal staff	Identification, internal interrupt
The traditional IT driver	Traditional IT limitations and its effect on cloud service adoption	Identification, internal interrupt
Forms of cloud service training	Forms of training to educate staff on cloud services.	Identification, internal interrupt and selection, external interrupt
Cloud considerations	The factors considered in the cloud adoption decision process	Development, design
Cloud service adoption framework	A structured and formal approach to cloud adoption	Development, design
Types of cloud services	Different models of cloud services	Development, design
Cloud service technologies	Technologies and solutions are available as cloud service offerings	Development, design
Unexpected cost increase in cloud service	Cost increase as an adverse finding in the study	Selection, analysis
Cloud decision-making process	The decision roles, levels of decision-making, and the process of decision-making	Selection, authorization

The focus of this study was to explore all the strategic decision-making processes that managers pursue. There were processes that emerged in alignment with the conceptual framework in relation to the phases of the strategic decision-making. The three major phases are identification, development, and selection. The recognition phase starts when management recognizes the benefits of cloud services start considering it.

The first phase of the decision-making process is the identification phase, which covers the realization of the value proposition and a careful understanding of the benefits that it presents. In the study, the cloud users articulated the benefits of cloud service adoption the primary of which was cost savings and ease of use. Both the cloud users and the cloud providers understood this.

The development phase covers the consideration of the various cloud models and deployment options by searching for alternatives and screening them at a high level for feasible and ideal options. The selection process involves further analysis and bargaining to come to the final choice and authorize the implementation. The three core components of the strategic decision-making process in the conceptual framework are recognition, development, and selection. The interrupts are in the internal and external factors that affect decision-making.

The recognition stage involves establishing a clear understanding of the benefits of cloud services as well as the disadvantages and align them with business strategy. The business problem that it seeks to solve must be spelled out and understood. Following the articulations of the issues is the development of effective mitigation strategies for a feasibility assessment. The development component is to select the most feasible option

keeping in mind the capacity of the company to absorb the cost and any accompanying risks that come with the chosen model. The last stage is to exclude the preferred model for successful cloud service adoption. Strategic decision-making model can be used in formulating an understanding of strategic-decision-making for information systems (Henfridsson & Lind, 2014) as shown in Figure 4.

The effective recognition of the benefits requires understanding the cloud services and the service models and technologies available. In the research study, the cloud users lack the requisite training and understanding of the cloud services. This affects the diagnosis of the need for the cloud service. There is a gap in understanding between the technology-based cloud user company and the non-technology companies. The cloud user in the technology industry presents a clear and detailed understanding of cloud services. TCU-1 stated, “Cloud services refer to any IT services that are provisioned and accessed from a cloud computing provider. a cloud services provider fully manages eas access to applications, resources and services, and. Cloud services are delivered over the internet and accessible globally from the internet. There are three basic types of cloud services: Software as a service (SaaS) Infrastructure as a service (IaaS) Platform as a service (PaaS).”

The explanation of cloud service is limited in the other non-technology cloud user organizations in the health and legal industries. HCU-1 defined it as “using a computer service without installing the servers yourself but let someone else provide it at a fee. HCU-1 defined it as, “When someone else builds, and you use the service,” LCU-1 explained it as “Using an online system that is not hosted by the firm.” LCU-2 stated,

“There are many cloud providers, including Amazon and Microsoft, who offer cloud services to customers. My technical understanding is limited, but I know it is based on what you use online and pay for.”

Given the limited understanding of cloud services, it limits the ability of the cloud user organizations to make an effective diagnosis of the problem and understand the problem. The training that is offered to the cloud providers and the technology cloud user organization are very detailed in the form of workshops, on-demand and online web courses as well as offsite corporate-sponsored training. The elaborate training regime explains the reason for the deeper understanding of the technology companies.

The benefits of cloud services are articulated in a more clear manner by the cloud providers, but the overall emphasis for the benefits of cloud services from the perspective of cloud users centers on cost reduction and ease of use except for the small business that is in the technology industry that can expand on the benefits beyond the cost and ease of use benefits.

Diagnosis involves seeking to understand the concepts of cloud services and all the determinants for a successful adoption, including the risks surrounding it. The diagnosis requires a thorough understanding of the subject matter through either internal training or external knowledge transfer. The diagnosis of the problem is further exacerbated by the fact that the cloud users did not have any formal training except for the technology organization, which had training because their business model requires a good understanding of cloud service.

The diagnosis phase involves scrutiny of the problems and challenges that might affect the decision. In this study, the respondents identified several challenges of cloud service adoption. However, the major challenge that emerged was the fact that internet outages are challenges that affect cloud service. However, in the decision-making process, the diagnosis should be done ahead of time and not an afterthought. The reference to internet outages is all because of experiences.

The Technology Company expressed the need to procure secondary internet connectivity from another vendor as a back to ensure continued cloud service availability. The challenges are in Table 8. There is a huge dichotomy between what the cloud providers consider the challenges of cloud service adoption and that of the cloud users. Complexities such as meeting compliance requirements are not captured as a challenge by the cloud users even though it appears as a critical challenge for the cloud providers. Meeting compliance requirements of laws and regulations is also a challenge of cloud services (Albakri et al., 2014).

Another theme that emerged that requires future study is the unexpected increase in cost in cloud adoption. Unexpected cost increase is an area that needs more study because, contrary to the literature and the majority of the respondents, it emerged that the ease of use of cloud computing in some cases results in IT sprawl, which leads to increased cost that outpaces productivity. This area must be considered in the future for diagnosis in the cloud adoption decision-making process. One of the cloud provider respondents captures this phenomenon. CP2-1 explained IT sprawl by stating, “Sprawl has to do with the fact that the ease of installing servers often leads to a reckless

deployment of servers when they are not needed. In the traditional deployments, the lead-time for hardware procurement and the installation often discouraged people from installing servers frequently. This is not the case with the cloud since it is relatively easier, and so less attention is paid to the potential waste of resources."

Cloud security, as a concern to consider, also emerged as a non-issue for the cloud users. All three cloud user organizations expressed profound confidence in the cloud providers to host their data. Their confidence is based on the fact the cloud providers they use have big names, and they are very comfortable with placing their data and that of customers in the hands of the third party cloud provider. The cloud providers, on the other hand takes cloud security seriously and spend an enormous amount of effort and money to fortify the security controls on their respective platforms.

Though all the cloud providers stated several factors that provide them a competitive advantage in cloud service adoption, the cloud users did not consider cloud service adoption to give them any special competitive advantage. CP1-1 stated, "AWS has significantly more services and more features within those services than any other cloud provider does. The fast pace of innovation. AWS released 1,957 new services and features, innovating at an unmatched pace, especially in new areas such as machine learning and artificial intelligence, Internet of Things, and server-less computing. With AWS, you can take advantage of the latest technologies to innovate, differentiate, and deliver solutions fast. CP1-2 stated, "Increases speed to market and empowered quicker innovation. As leaders in the industry, we have large economies of scale that help us in our pricing and features in the various service models we have." CP3-1 stated,

“Efficiency and agility.IT is accelerating time to value.IT as a business enabler. While the cloud providers gave elaborate thought to the competitive advantage that cloud service adoption provides, the cloud users did not see it as a major factor.” HCU-1 stated, “There is no clear competitive advantage for the cloud service we use.” LCU-2 stated, “No discernible benefits for us as lawyers.”

However, in the case of the technology cloud user organization, the responses matched that of the cloud providers in detail and significance. TCU-1 stated, “Cloud services give enterprises a competitive advantage by providing the most innovative technology available. It reduces the time needed to go from an idea to a service or app. It facilitates collaboration and innovation, allows analysis of huge amounts of data effectively, and gives the ability to easily and cost-effectively upscale cloud computing so that the organization can quickly respond to demand. With cloud services, IT staff can be freed from routine maintenance to focus on more strategic projects. Cloud platforms provide an unmatched level of flexibility and enable employees to access systems and data from almost anywhere. This means that employees can work more flexibly to suit their lifestyles and find a better work-life balance, for example, by working from home or outside of normal working hours.” This variance in perspective is because there is a solid understanding of cloud service and training for the technology company compared with the non-technology companies.

On the emergent theme of training Internal IT staff, it was deemed necessary because cloud adoption requires a shift in culture to initiate the migration to the cloud. They are often not ready to transition because the fast pace in the cloud space means they

have to upgrade their skills at a pace they are not used and also presents career development changes that most are not willing to embrace. In this case, Human Resource Departments have to institute elaborate training programs to prepare the local staff for migration. This theme, though, was pronounced, is one area that future studies must look into as consideration for cloud adoption. The impact of the internal Staff must be taken into consideration and efforts made to prepare the minds. CP1-2 stated, “The biggest challenge is the shift in culture as it pertains to operations. Many organizations are still getting used to not having to manage physical infrastructure on-premises.” CP2-1 stated, “Cloud service adoption allowed IT to focus on more strategic and business-relevant activities” HC2-1 stated, “I do not know what the impact is on the internal IT staff.” LC2-2 stated, “We do not have an internal IT staff.” TCU-1 stated, “Moving application and workloads to the cloud has changed how IT staff operates. Cloud computing changes staffing requirements but does not always reduce the total number of staff. In many cases, we simply change headcount allocations to match shifting responsibilities. Teams learn new processes and tools, but the majority of the existing IT skills are still valid in the cloud.”

At development stage in the strategic decision-making, a careful approach is developed for the choices that need to be made before they are presented for selection and authorization before adoption. One item that emerged is the use of a comprehensive cloud adoption framework by the cloud providers. These frameworks include AWS Cloud Adoption Framework (AWSCAF), Cisco Domain Ten, and Microsoft Cloud Adoption Framework (MCAF). These frameworks provide elaborate steps to take to

identify applications that are to be migrated to the cloud, the internal alignments, the factors to consider, the expected outcomes, and challenges. The cloud providers articulated these frameworks as necessary tools in the decision-making process. However, none of the cloud user organizations used any formal framework in the cloud adoption decision-making process. In all cases, the small organizations did not consult a formal framework, which meant the choices made were made with limited training and understanding of cloud services.

Related to the cloud adoption framework is the cloud technologies and services that are offered by the cloud providers and to be consumed by the cloud users. There is a vast array of cloud services and technologies that are offered by the cloud providers by not known to the cloud users in this study. The technology company does identify a few of the technologies, but the list is much more comprehensive than is known to the cloud users. Tools and services cover servers, applications, business intelligence, analytics, infrastructure-as-a-service (IaaS), Platform-as-a-Service (PaaS), and Software-as-a-Service (SaaS), disaster recovery solutions, storage solutions, Private Cloud Appliances, Cisco Cloud Technologies, Software Defined Access; Software-Defined Networking among several other cloud services.

Despite the lack of training, no formal adoption framework, limited understanding of the cloud services, among other factors that affect the cloud adoption decision process, all the cloud users stated that they had not experienced any noticeable negative impact except for the impact the internet outages causes. The resiliency of the cloud services

offered by the cloud providers does not preclude adequate preparation by the cloud users. They all considered the outcome of cloud service adoption as positive.

Summary

The overarching research question was; what are the decision-making factors that have contributed to the success of companies adopting cloud services? The supporting research questions in the study align with the decision-making and the general understanding and preparedness of the small companies in making the decision. The identification of the gap in the literature and the research study findings resulted in providing answers to the research questions, providing a future research opportunity for further exploration of the research problem.

Four main areas of the supporting questions focused on the profile of the organization, management understanding of cloud services, decision-making strategy of cloud services, outcomes of cloud services. The questions include the following; 1) what industry does your organization belong to? ; 2) What is the primary service or function of your organization?; 3) How does your organization use Cloud services?; 4) Can you describe who performs your internal IT functions?; 5) Can you describe the highest decision-making entity in your organization?; 6) Can you explain what cloud services are?; 7) What are the benefits of cloud-based applications to your organization?; 8) What challenges or drawbacks have you experienced with using cloud-based applications ?; 9) How does your organization use cloud services?; 10) How do cloud services enhance your competitive advantage?; 11) What makes you comfortable to store your data in the cloud?; 12) What training did you receive to gain a greater understanding of cloud

services?; 13) What were the primary considerations in the decision to go the cloud?; 14) What was your role in the decision to go to the cloud?; 15) Describe the formal framework you consulted in the decision-making process?; 16) What obstacles did you face in the decision to adopt cloud technology?; 17) What were the unforeseen factors the emerged during the decision-making process that was not known before?; 18) What has been the positive outcome of cloud adoption?; 19) What has been the adverse outcome of cloud adoption?; 20) What has been the effects of cloud services on the internal IT staff?

The case study revealed some expected results and unexpected results that will need further research in the future. The limited training, the less focus on a formal framework for cloud adoption, the limited understanding of cloud services and technologies, and limited understanding of the challenges are all expected outcomes, however;, the emergence of increased cost because of cloud adoption was unexpected. Another unexpected outcome was the fact that the cloud users generally did not see cloud service adoption as a competitive advantage, which in part is because of a lack of understanding of the full benefits beyond the narrow use case. One other emergent theme was the fact that small businesses in the technology field understood cloud services more because that is naturally their operation while the non-technical organizations lacked deeper understanding. A deeper look at the uniqueness of technology companies versus non-technology companies and how they compare in terms of cloud adoption success will further add more depth to the topic. The cultural aspects of internal IT staff were not also expected. There is a gap between what the industry provides and expects cloud users to embrace and what the cloud users are aware of and understand. Further exploration is all-

necessary in the area of customized training for small business cloud users who are not in the technology industry.

The findings aligned largely with the literature regarding the benefits of cloud service adoption, the challenges, forms of cloud services, cloud service adoption considerations, the decision-making processes are not structured in the small businesses regarding cloud service adoption, and aligns with current literature in small business cloud service adoption. Further exploration for future research in the areas identified may enrich the body of knowledge on cloud service adoption. The recommendations and conclusions will be discussed in Chapter 5.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this qualitative multiple case study was to explore the decision-making processes in cloud adoption by three small businesses in IT, legal, and health industries. Little is understood about how managers and leaders make decisions to adopt cloud services (Froehlich, 2015; Kshetri, 2013). The study was an exploration of the decision-making processes, the considerations in cloud service adoption, the benefits and challenges, the impacts, and the level of preparedness of the decision-makers to make the decision to adopt cloud services.

The perspective of cloud providers was important in explaining available services and features for cloud users to consider during the selection process and what the cloud users know and understand in the selection process. This approach unveiled a gap in what the cloud providers understand and what the cloud users perceive cloud services and features to be. The lack of a rigorous decision-making process and framework was accompanied by a general lack of training and understanding of cloud services. The decision-making process by the small businesses in cloud service adoption revealed some gaps compared with the decision-making process model in the conceptual framework. The interviewees were senior-level staff who had various levels of involvement in the decision-making process to adopt cloud services. All the small businesses were in the same geographical region. The IT company tended to align more with the expectations of the cloud providers than the others in legal and health industries, whose core competencies were not technology-related. The study results contribute to positive social change with heightened awareness in the necessary ingredients in cloud service adoption

decision-making to harness the benefits of cloud services such as reduced cost of IT service delivery, quick to market, innovation, and agility. The results also highlight the need for small businesses to put in place appropriate measures to mitigate the risks associated with cloud services as part of the cloud adoption decision-making process.

Interpretation of Findings

A strategic decision-making model was the basis for the conceptual framework for this research as put forward by Mintzberg et al. (1976). This model asserts that decision-making is a planned activity that requires a thorough assessment of all the factors that go into producing a successful outcome. In this case study, I explored the decision-making process and how managers consider the full ramifications of cloud services to avoid unforeseen dire consequences. Management has often rushed to adopt cloud services because of the advertised benefits (Kim & Kim, 2016) without the requisite due diligence and thorough assessment of the ramifications before choosing the appropriate service or deployment model (Armbrust et al., 2010; Wang et al., 2014). A full grasp of the risks and potential negative consequences of cloud adoption is critical to identify effective mitigating strategies before proceeding to select a solution for implementation (Sohaib & Naderpour, 2017).

All the variations of strategic decision-making share the phases of problem familiarization, solution building, decision implementation, organizational learning, and external influences. The strategic decision is often complex, open-ended, and novel (Mintzberg et al., 1976). The three high-level phases are underlined by seven main routines: (a) recognition, (b) diagnosis, (c) design, (d) search, (e) screen, (f) evaluation

choice, and (g) authorization. The most critical phase of strategic decision-making is diagnosis, which involves taking the time to thoroughly understand the trigger for the decision before embarking on a search for solutions. The recognition phase starts when management recognizes the benefits of cloud services and start considering it. Diagnosis involves seeking to understand the concepts of cloud services and all the determinants for a successful adoption, including the risks. The development phase involves the consideration of various cloud models and deployment options by searching for alternatives and screening them at a high level for feasible and ideal options. The selection process is further analysis and bargaining to come to the final choice and authorize implementation.

Recognition Phase of Cloud Adoption Process

The strategic decision-making processes start with a trigger that might be reactive or prospective but that leads to the formation of subcommittees who study the ramifications and the depth of the issues surrounding the specific information system trend. The activities of the subcommittees often result in the emergence of a strategic direction (Henfridsson & Lind, 2014).

Cost savings. In this study, the trigger for decision-making was cost reduction, which resonates with the literature. The trigger in a decision-making process is the recognition of cost savings and efficiency gains in adopting cloud service by small businesses. In looking deeper to cut costs, efforts were targeted often at discrete items, such as electricity, cooling cost, data center floor space reduction, hardware, software licensing, staff, and many more (Maresova & Sobeslav, 2017; Newson, 2015; Vasiljeva

et al., 2017). As a technology that enables organizations to offload a significant portion of their capital and operational expenditure and maintain rapid delivery of services, cloud services are a desirable proposition (Fleury et al., 2015). The cost savings are in the initial investment and operational benefit, in addition to accompanying expense to ensure secure data management (Alkhater et al., 2014; Koo & Kim, 2015).

Speed to market. In addition to the reduction of capital expenses, organizations have an insatiable appetite to meet demands with quick-to-market products and services (Baltatescu, 2014; Kim & Kim, 2016; Vasiljeva et al., 2017). In the traditional sense, the internal bureaucracy of hardware acquisition can often be a bottleneck to provide the infrastructure and platform for development activities to begin. Cloud services offer the ready platform for organizations to meet growing and often time-sensitive seasonal demands (Baltatescu, 2014). Computer resources can be made readily available to an organization for developers to quickly develop software to meet business needs without having to suffer the internal bureaucracies for hardware and software acquisition and configuration (Kim & Kim, 2016).

Diagnosis Phase of Cloud Adoption Process

The recognition alone is not enough and must be supported by a thorough diagnosis of the problem to generate alternative solutions to consider. Managers who pursue cloud services should do so with a great deal of understanding of the factors in the decision-making as well as the strengths and weaknesses of the various cloud deployment and service models (Grobauer et al., 2011; Sohaib & Naderpour, 2017). Successful cloud migration would require a clear understanding of the cloud environment and careful

planning, system analysis, and execution to ensure the cloud solution's compatibility with organizational requirements while maintaining the availability and integrity of the organization's IT systems (Alkhalil et al., 2017).

The leadership of the small businesses in this study, except for the technology-based small business, did not have a formal and thorough understanding of cloud services. A business's board of directors and management must understand cloud services to set the tone for governance (Al-Ruithe et al., 2016). Managers and decision-makers must adopt an MCDM technique because many uncertainties and nuances could lead to dire consequences. (Sohaib & Naderpour, 2017). The use of decision-making criteria lacked in the study of the three small businesses. The scrutiny of the modes of the acquisition may enrich decision-makers in cloud adoption (Van Roekel, 2012). The technology-based company had a better understanding of cloud services and the factors to consider because the chief information officer was technical and understood the nuances of cloud services.

Organizational learning is the conditioning of employees to accept and support cloud services (Sohaid & Naderpour). If the necessary framework exists to train and equip employees with the requisite skills to embrace cloud services, the implementation is more likely to succeed. In this study, the small businesses that adopted cloud services did not understand cloud services, and they did not have training better to understand the full ramifications of cloud service adoption. A way to address this shortcoming would have been formal training for the staff.

Though the cloud providers had elaborate training for the staff, the small businesses did not have any training at all. The lack of training meant the IT staff did not have clear career advancement. The management of the small businesses should embrace formal training for the staff to help them better support the organization and to help them with their career enhancement. Once again, the exception to the training is the technology-based cloud user who had internal and external training for the staff because they considered that part of their core competency.

In seeking to understand the level of understanding by the small businesses, the respondents provided their definition of cloud service by looking at cloud services solely from the perspective of the cloud service they are using. The literature review covered the definition of cloud service to be based on a set of attributes. The widely adopted definition of cloud services is put forward by the National Institute of Science and Technology (Alali, & Yeh, 2012; Mell & Grance, 2011). The critical attributes of cloud services include broad network access, rapid elasticity, measured service, on-demand self-service, and resource pooling (Mell, & Grance, 2011; Wang et al., 2014). The understanding was narrow and limited in the explanation of cloud services. The definitions by the small businesses were not aligned with the official definition showing glaring differences in the literature and the reality for the small businesses. They explained cloud service purely from their respective adopted cloud services and featured such as cloud storage and the use of cloud as a web portal.

The respondents in this study from the small businesses did not have a deep understanding of the cloud services, which means they could not make a thorough

diagnosis of the cloud services and features. This was evidenced in their narrow definition of cloud services. In strategic decision-making, the diagnosis phase involves breaking the choices down into different alternatives. Having an understanding of the cloud services enables the decision-maker to identify the options for deeper analysis. In this study, the choice was made generally based on advertised benefits.

Development Phase of Cloud Adoption Process

In strategic decision-making, the second phase is the development of the alternatives for selection. This requires a deeper understanding of cloud services, which was lacking for the health industry and legal industry small businesses. Strategic decision-making requires a thorough assessment of all the variables that go into producing a successful outcome. The leadership of the small businesses except for the technology-based small business, did not have a formal and thorough understanding of cloud services. The board of directors and management must understand cloud services to set the tone for governance (Al-Ruithe et al., 2016).

Cloud adoption decision-making framework. Small businesses do not have the luxury of large datasets to use in decision-making. Many in management do not see the many benefits and features and do not even plan to adopt cloud services, or even if they do, it is limited because of infrastructure and security concerns, which in no small measure is because of lack of understanding (Akande, & Van Belle, 2014). Limited literature exists to adequately align the strategic business targets with the knowledge of small business managers regarding the adoption of cloud services (Nkhoma, & Dang,

2013). The lack of understanding necessitates a framework to guide the decision-making process.

There have been many frameworks that have been proposed to guide managers in the decision-making of cloud services adoption (Sohaib, & Naderpour, 2017). Management often lacks a coherent approach to support cloud decision-making (Alkhalil et al., 2017). A vital fr, Yenamework is Technology-Organization-Environment (TOE) to explore the holistic and impactful factors (Sohaib & Naderpour). Regardless of the immense benefits of cloud services, the decision-making process must go through the lens of the technology, organization, and environment (TOE) theory (Lian et al., 2014; Low et al., 2011). The technological endowment of an organization with its attendant dynamics of complexity, compatibility, and relative advantage are the key drivers for cloud adoption. Organizational considerations are top management support, firm size, and technology readiness. Environmental factors are competitive pressure and trading partner pressure (Alemeye, & Getahun, 2015; Alkhater et al., 2014; Low et al., 2011).

Another framework for cloud readiness assessment is the Technology Acceptance Model (TAM), which looks at the perceived usefulness, perceived ease of use, and relative advantage (Alemeye, & Getahun, 2015;). Diffusion of Innovation is also a framework that consists of trial-ability and the observable result (TO), compatibility with current practices (Alemeye, & Getahun; Alkhater et al., 2014). All the frameworks can also be combined by pulling all the relevant considerations for decision-making (Alkhater et al.). These frameworks often focused on technological factors with limited attention to security (Alkhater et al., 2014)

Becoming Cloud services Ready (BCCR) framework, is another framework based on empirical data and literature to guide the readiness of organizations and the roadmap to adopt cloud services fully (Akande & Van Belle, 2014). The readiness assessment of an organization is an essential ingredient in the decision for cloud services or else they may fail in the implementation. Managers and decision-makers must adopt an MCDM technique because many uncertainties and nuances could lead to dire consequences. (Sohaib & Naderpour, 2017). A decision-making framework was lacking in the study of the three small businesses. The technology-based company was better in this area because the Chief Information Officer was very technical and understood the nuances of the decision.

The cloud providers elaborated on the various cloud adoption frameworks that they offer for cloud users who adopt cloud services to consult. These frameworks were Amazon Web Services Cloud Adoption Framework (AWSCAF), Cisco Domain Ten, and Microsoft Cloud Adoption Framework (MCAF). Even though the small businesses lacked the formal training and understanding of cloud services, none of them consulted any cloud adoption framework. The lack of training often leads to a lack of preparedness to mitigate unforeseen challenges such as loss of internet connectivity, which was apparent in the responses as negative outcomes that they had experienced.

Though there is an elaborate list of frameworks in the literature and published frameworks by the cloud providers, the cloud users did not know of any framework to use in guiding the decision-making process. A list of all the options and a breakdown of their strengths and weakness and the factors to consider in the decision-making are all

essential ingredients of the cloud adoption decision-making framework, which none of the small businesses consulted.

High availability and reliability of cloud services. A key concept in information management is reliability and availability (Alali & Yeh, 2012). All organizations exist to provide goods and services, and therefore anything that positively or negatively impacts these twin goals must be taken seriously (Armbrust et al., 2010). Deciding to place corporate assets under the control of another party has the potential to incur the negative consequences of the availability and reliability of the systems (Sandhu et al., 2010). The main challenge that was cited by all the small businesses that adopted cloud services was the reliability of the internet. Anytime the internet was down, their use of the cloud service was impacted. However, because of the lack of special appreciation of this risk, they had no mitigation for that exposure except for the technology-based company that wanted to implement secondary internet connectivity as a backup, redundant internet connection. Even though this was an afterthought, they had plans to address it. However, the small businesses that were non-technology based did not have the requisite training and awareness to consider the availability concerns.

Cloud adoption decision-making alternatives. As part of developing a list of alternatives, the respondents identified several considerations in cloud adoption decision-making. The considerations include the deployment model, the size of the company, the service model, the focus of the adoption as in whether to enhance scalability or cost reduction (Chen, et al., 2016). Cloud services offer an organization the ability to streamline processes, increase agility, faster adoption of new technology, eliminate waste,

reduce cost, maximize profit, create and maintain strong competitive advantage must be pursued (Alkhalil et al., 2017; Vasiljeva et al., 2017). Many organizations have long recognized the need for scalability, skilled workforce, agility, and streamlined resources for maximum competitive edge (Chihande, & Van der Poll). Cloud services are changing organizations through the efficient utilization of resources, thereby saving money (Zhang et al., 2010). The considerations include items like security.

Cloud security, privacy, and governance. Though Security often has the primary challenge of cloud services (Abdellaoui et al., 2016; Baltatescu, 2014; Dhar, 2012). Information security is also a key benefit depending on the size of the organization (Nedelcu et al., 2015). For small businesses in this study, security rather emerged as a significant advantage instead of a concern (Kim, & Kim, 2016). This is because they see cloud providers as more competent to host their critical data. Cloud services are a better fit for small to medium size companies (Carcary et al., 2014; Sonfield & Lussier, 2014; Tehrani, & Shirazi, 2014).

Both the cloud providers and small businesses who adopt cloud services saw security as an advantage because the cloud providers often account for it, and the users trust the cloud services platforms. The things that are accounted for include Audit and Compliance and Risk Governance, Security is built as a foundational part of the cloud platforms, multi-layered security provided across platforms, built to satisfy the security requirements, cloud security framework inbuilt into the operations of the cloud providers, reliability, legal considerations, the attack vectors are reduced, encryption of all data, chances of human error are also reduced, an enormous amount of money in research and

development and security, data storage is a shared responsibility, and AWS is architected to be secure and flexible.

Taking security for granted can, however, have disastrous outcomes since security breaches have caused enormous damages to several businesses. Although the many benefits, including cost reduction, and quick delivery to market (Hobman & Walker, 2015; Yang et al., 2013), cloud services have resulted in spectacular failures including the exploitation of security flaws by hackers, and immature policies and procedures (Froehlich, 2015; Rong et al., 2013).

Organizational learning for cloud adoption decision-making. Strategic long-term goals and the tactical means of attaining them are fraught with uncertainties because it is difficult to understand and predict all the potential negative and positive outcomes. The small businesses did not have the technical acumen or the training to go through all the complex considerations before making the decision. Though the technology-based cloud user company had a deeper understanding of cloud services, they did not consult a formal framework even though their approach was an informed one. Small businesses are challenged in the area of strategic decision-making (Myšková & Doupalová, 2015; Oliveira et al., 2014) because of the uncertainty and the difficulty to account for all the risks associated with the decision-making and attempts to manage risks are unsystematic and ad-hoc (Myšková & Doupalová, 2015).

Strategic decision-making is fraught with trial and error approaches by small to medium-sized companies (Teirlinck, & Spithoven, 2013). Alkhalil et al. (2017) discussed the benefits of cloud services but also acknowledged the fact that it requires a complex

decision-making process. The definition of a long-term strategic goal is complicated because of the uncertain circumstances surrounding the risks. The risks and uncertainties could either be uncontrollable, partially controllable, or controllable (Myšková & Doupalová, 2015).

Selection Phase of Cloud Adoption Process

The final phase of the decision-making framework is the selection making an authorizing. The selection process is further analysis and bargaining to come to the final choice and authorize the implementation. The planning of cloud adoption requires a comprehensive assessment of multiple layers of the cloud infrastructure to determine the appropriate service provider, the security of the information assets, and the successful implementation. (Lotfi et al., 2015). The understanding of cloud services may enable management to identify opportunities, capabilities, potential risks, offering models, suitable configurations, level of support, risks, pricing models, potential providers, and the expertise required to manage applications in the cloud environment. Risk assessment, rigorous assessment of options, and projection of outcomes are essential to achieving set targets (Fazlollahtabar & Saidi-Mehrabad, 2015).

More In-Depth Analysis of Alternatives and Selection.

Once the alternatives have been developed, their more in-depth analysis requires a thorough understanding. This exercise is an analysis of the considerations to identify their ramifications. In this study, the respondents highlighted several factors to consider in the decision-making. The majority of the factors were by the cloud providers. Cloud consumers only listed ease of use, efficiency, and cost savings. The more complex

nuances such as service level agreements, availability of services, vendor lock-in, innovation and agility, regulatory compliance, risk avoidance, regulatory requirements, infrastructure implementation requirements, Operational efficiencies, Security Considerations, additional features, Increasing business agility, Preparing for new technical capabilities. Power to innovate, Reduction in vendor or technical complex, and Optimization of internal operations. The small businesses generally had a limited view of the deeper level analysis of the considerations and resorted to the advertised benefits of ease of use and cost savings.

Cross-Case Analysis of Cloud providers and Cloud Users

Across the cloud providers and cloud users, unique perspectives emerged as similarities and differences. Certain things emerged across the individual respondents within the same organization, across organizations within the same industry and industries. Those decision-making processes cut across industries, however, from different perspectives.

Understanding of cloud technology. One theme emerged was the fact that the cloud providers had a deeper and thorough framework, training, and well-advertised feature sets that were not known to the small businesses. The technology company though a small business, was better aligned with the expectations of the cloud providers in terms of better analysis of the considerations in the decision-making process. The non-technical small businesses resorted to the cost savings and the ease of use line of analysis. This confirms current literature that the management of small businesses has often rushed to adopt cloud services because of the advertised benefits (Kim & Kim, 2016) without the

requisite due diligence and thorough assessment of the ramifications before choosing the appropriate service or deployment model.

Besides the emerging theme of the technology-based company doing a better analysis and possessing more knowledge, another item that emerged as a real challenge for cloud adoption but only cited as a benefit was cost savings. Though cost saving is a benefit, it emerged that it can result in the opposite if not managed carefully because of cloud service sprawl. Which is the phenomenon of over-provisioning what is needed because it is easy to do. There are times when the cost has exceeded the value of productivity, a point that was emphasized by cloud providers.

Clarity of the decision-making process. Across the spectrum of the three phases of the strategic decision-making of recognition, development, and selection, the small companies did not have a clear plan of decision-making. The decision-making was ad-hoc and was done with a limited understanding of cloud services. This was further exacerbated by the fact that they did not consult a formal framework in the decision-making. This applied to both the technical and non-technical companies.

The more technical small companies have a better advantage because though they may not have consulted a framework, they had a deeper level of understanding and were not as lacking in understanding as to the non-technical companies. This is an area that can be explored further in future studies. To find out if the model by the small businesses in the technology industry is better off in cloud adoption decision-making than non-technology based small businesses. The gap between the cloud providers and the cloud users is vast, and that corroborates existing literature. With such disparity in

understanding, it affects the expectations of the cloud users who are not able to maximize the benefits of cloud services and not able to negotiate the proper terms and conditions in the service level agreements. Issues of availability and connectivity challenges identified by the small businesses are usually in the contracts between the cloud adopters and providers in the service level agreements section, like what traditional outsourcing entails (Dhar, 2012).

Perspectives on the benefits and challenges of cloud services. When it came to the impact of cloud services, the assessment was limited to what they had stated as the benefits of cloud services from the outset and mostly focused on cost reduction and ease of use. Cloud services are a disruptive technology, and careful analysis must be part of the decision-making process to assess the impact of the radical changes to business operations. (Battilana & Casciaro, 2012). In cloud services decision-making, the adopters must choose from the myriad of options among the cloud providers. There are over 100 cloud providers. Amazon alone has over 16,000 different configurations (Alkhalil et al., 2017).

Small business managers lack the knowledge about the internal and external business environment and related factors that are pertinent to their strategic decision support in a dynamic and rapidly evolving world (Khatun, & Miah, 2017). Realizing the environmental impacts at the early stages of a decision-making process is essential to avoid the confusion about the complex linkage exists between innovations that emerge internally and the external strengths and opportunities that affect the small businesses (Teirlinck, & Spithoven, 2013).

Even though cloud services have several advantages, the critical concern has often been around security (Alali, & Yeh, 2012; Choo, 2010; Grossman, 2009; Nedelcu et al., 2015; Zhang et al., 2010). Placing that information in the hands of a third party can have several implications (Kim, & Kim, 2016; Ng, 2018) which brings into focus the importance of decision-making the by small businesses and what they have to take into account for cloud services (Sohaib, & Naderpour, 2017). Decision-making must focus on goals, expected returns, competitive analyses, and tapping into pre-existing knowledge, and predicting uncertain outcomes (Eijdenberg et al., 2017).

Cloud security perspective. Another important consideration is the elements of information security, namely, confidentiality, integrity, and availability (Koo, & Kim, 2015). Specific security issues include privileged user access, regulatory compliance, data location, data segregation, recovery, investigative support, and long-term viability (Albakri et al., 2014; Rong et al., 2013). Organizations invariably must conform to various laws and regulations and compliance requirements (Albakri et al., 2014). They face new challenges in the context of cloud services because of the migration from on-premise to off-premise locations (Abdel-Maksoud et al., 2015). The cloud providers placed much premium on the security requirements for cloud adoption and spent much money on research and development and to make sure that the cloud services they provide meet strict regulatory and compliance requirements. The cloud users in this study this not consider it and had great confidence in the cloud providers to provide adequate security without the requisite knowledge to validate the effectiveness of the security controls in place. Without a firm commitment from top leadership regarding strategic

direction, budgetary allocation, and organizational drive, the challenges inherent in cloud services adoption cannot be overcome (Low et al., 2011).

Competitive advantage perspective. As organizations strategize to establish and maintain a competitive advantage in their respective industries, there are also times when organizations respond to changes in the environment in which they exist to shape the direction of the organization. Environmental factors are competitive pressure and trading partner pressure (Low et al., 2011). This is part of the external factors that affect cloud adoption decision-making is the need to create and maintain a competitive advantage. As the competing companies embrace technologies that shorten their delivery timelines, it creates momentum for others also to pursue the same (Dhar, 2012).

Cloud services are driving many companies to greater heights, so companies seek it to stay competitive (Alkhalil et al., 2017). The small businesses did not see cloud service adoption as a competitive advantage but focused on ease of use, improved customer service, and cost savings as the predominant reason for adoption. However, the cloud providers spelled out the competitive advantages of cloud services adoption including innovation, free up internal IT staff to focus on more business-aligned tasks, reduced lead times for IT service delivery, a collaboration between employees and between organizations, big data analytics, quick to market delivery among many other factors.

The interviews yielded findings that add to the body of knowledge for the decision-making process and the level of preparedness and knowledge needed to make successful cloud adoption. The gaps identified may be additional areas for future studies

to augment ingredients for decision-making by small businesses in the formulation of strategies for cloud adoption. Each respondent provided insight into their level of understanding of cloud services, the benefits and challenges relative to cloud services, and the impacts of the decision to adopt. The synthesis of the codes to identify the emerging themes using CASDAQ was pertinent to identifying the critical pieces of how small businesses pursue cloud adoption.

The findings of the CASDAQ software identified 13 emergent themes across the responses from both the cloud providers and cloud users. There significant variances between how the cloud providers expect cloud adoption process to occur and how the small businesses pursue it.

Limitations of the Study

The case study has several limitations, and any confusion in the purpose and implementation of the method can have negative consequences (Baskarada, 2014). The limitation of my study was the number of cases that were selected for the study. There were three companies selected as cloud providers with two participants from each company, making six and three small businesses from the legal, medical, and technology industries with two participants from each company. I used purposeful sampling to select the participants for the cloud providers and six participants for the cloud Users who have a part to play in the cloud service adoption decision-making. The cases were limited and might not be generalizable for al small businesses. Selecting small businesses across different industries, however, provides the triangulation for the credibility of the study. I took steps to do member checking to ensure the credibility of the study.

The participants from the small businesses were all chosen from the same geographical location, which might not be a true representation of small businesses in all parts of the USA and, for that matter, global representation and, therefore, might not be transferrable. As this is a qualitative study with few participants in a single geographical area, the study may not be transferable. Contrary or contradictory cases were reported to enhance the credibility of the research without any interpretations (Reynolds et al., 2011). Also, the selection of the respondents from three unrelated small businesses provides a triangulation of sources and perspectives that are varied enough to provide the basis for transferability. The perspectives were similar across industries, especially in the two non-technology-based companies. Having the triangulation of sources provided a basis for transferability.

Another limitation was confirmability. The participants from the small businesses who were not in the technology industry lacked detailed technical understanding, and therefore their contributions were limited in depth but were typical of non-technology companies. Their responses were limited in terms of understanding of cloud services compared to the technology-based companies. The management of small businesses that were not in the technology industry may be similar in profile and position of making strategic decisions. Having a total of four respondents from two non-technology-based companies provide a triangulation that represents companies of similar profiles. Two respondents from the technology-based companies also responded that they were not unduly influenced, so the study is confirmable and providing more detailed responses but was able to provide responses that formed the basis of the study.

Another limitation was that my level of expertise in the subject matter had the possibility of influencing the research outcome. My competence in the subject matter regarding 20 years of experience in the IT industry and several certifications in cloud services provided me the credibility for research quality and reliability (Patton, 2002). Triangulation of sources and methods to corroborate research findings enhanced the quality of the study. I disseminated the draft report for the respondents to review for accuracy (Patton, 2002; Yin, 2014). I remained neutral throughout the interviewing process and not act in any way to affect the respondents' perspective one way or the other.

I avoided leading questions that might influence the answers of the respondents. Using member checking also enhances the credibility and confirmability of the research (Yin, 2014). Gaining access to management in all the organizations was difficult. I had to reschedule meetings multiple times to interview them eventually. I captured responses verbatim and avoided leading questions that could skew responses in one way or the other.

Recommendations

Cloud services, like all new and emerging technologies, require extensive research to address several issues such as security, availability, compliance, and jurisdictional limitations and related areas (Alali & Yeh, 2012). This study has focused on the decision-making process that small businesses go through in adopting cloud services. The concepts covered have mostly focused on what cloud services mean, the benefits of cloud services, the risks associated with it, why it is a better fit for small

businesses, and the decision-making considerations in cloud services adoption. All of these are pertinent topics and have been discussed extensively in various literature. What is lacking is a more in-depth analysis of what small businesses go through in their decision-making before adopting cloud services. There is little literature on a concise prescription of what small businesses should consider in cloud services adoption. Also, a vacuum exists in the area of security that needs to be filled (Choo, 2010).

Areas of additional research can be identified by effectively looking at recent market trends and how organizations are embracing them in addition to the different deployment models (Yu et al., 2011). Some of the opportunities for future research include analytics, cloud reliability, social issues in cloud services, and cloud workflow management (Yu et al., 2011). Another area that needs in-depth research is virtualization since that is at the core of cloud services in general. Security, as it relates to virtualization, is a focus that future researchers can pursue (Zhang et al., 2010). Additional research into the influences of environmental and organizational conditions on cloud services adoption across different industries is essential. (Low et al., 2011).

An important area that emerged from the study for further research is cost as a deterrent for cloud adoption. The ease of provisioning resources in the cloud has resulted in many cases where the value that cloud adoption seeks to achieve is overrun by the cost of rapidly increasing and out of control use of cloud resources. Though cost savings has been advertised as the biggest benefit of cloud services adoption (Rong et al., 2013; Sinanc & Sagiroglu, 2013), if it is not managed carefully, it could result in the reverse and defeat the reason why small to medium-sized companies adopt cloud services

(Carcary et al., 2014; Sonfield, & Lussier, 2014; Tehrani, & Shirazi, 2014). The study should explore the causes of the sprawl and the controls that need to be put in place to protect the cost savings that the small businesses make when they adopt cloud services. The cloud providers emphasized this as an increasing phenomenon, and therefore future study in this area may enrich the cloud adoption decision-making process.

Another area for future study is cloud services and features training. Managers who pursue cloud services should do so with a great deal of understanding of the factors in the decision-making as well as the strengths and weaknesses of the various cloud deployment and service models (Grobauer et al., 2011; Sohaib, & Naderpour, 2017). Successful cloud migration would require a clear understanding of the cloud environment, careful planning, system analysis, and execution to ensure the cloud solution's compatibility with organizational requirements while maintaining the availability and integrity of the organization's IT systems (Alkhalil et al., 2017). The study should elaborate on the key concepts and features of cloud services necessary to train all decision-makers in cloud adoption.

The outcome of that study should help develop the core concepts need to help in fostering the understanding of cloud services, the considerations, the benefits, the challenges, and a simplified framework to follow to enhance the decision-making process for small businesses. This should take into consideration the fact that non-technology-based companies are the ones who demonstrated the greater need for understanding the concepts and frameworks for cloud adoption decision-making.

Related to the above, further should be conducted on the competitive advantages that emanate from cloud adoption by small businesses since most of the small businesses could not articulate clearly the benefits that cloud service adoption provides them over their competitors and how to leverage it through innovation to advance their strategic business goals.

Last but not least is further research into cloud adoption frameworks for small businesses that take into account what is relevant for small to medium-sized companies since cloud service is more applicable to them. This is because they see cloud providers as more competent to host their critical data. Cloud services are a better fit for small to medium size companies (Carcary et al., 2014). Managers and decision-makers must adopt an MCDM technique because many uncertainties and nuances could lead to dire consequences. (Sohaib & Naderpour, 2017). So future research into a small business cloud adoption framework can provide further depth in this area.

Implications

Several models for cloud adoption provide theoretical frameworks for organizations, but they are often difficult to implement in theory because of the difficult challenge of balancing the advertised benefits with the costs of security threat mitigation (Rong et al., 2013; Sinanc & Sagiroglu, 2013). Research in cloud adoption decision-making is paramount (Sandhu et al., 2010). According to Cloud Security Alliance (2013), the top two threats of cloud services are insecure application programming interfaces, which constitute 29% of all threats, and data loss or leakage represents 25%. Beyond security threats are many operational, financial, legal, compliance, and other pertinent

factors that need to be considered by management and fully understood before cloud services (Cloud Security Alliance, 2013; Rahimli, 2013; Sandhu et al., 2010; Yang & Tate, 2012).

This research may contribute to an emerging field of study in cloud services and the preconditions for successful cloud adoption. The process of decision-making permeates the entire spectrum of cloud services deployment, whether public, private, or hybrid. The challenges also exist in all flavors of cloud services models—Infrastructure as a service, platform as a service, and software as a service. Small and startup companies may benefit from the decision-making framework because they invariably do not have the scale of internal infrastructure investment, which makes cloud services more compelling (Walterbusch et al., 2013).

The findings of this research may contribute to the cloud services literature by exploring the ramifications in the decision-making for cloud adoption by cloud users. The positive social change may result in enhancing the success rate of cloud services adoption even though it could decrease the adoption rate by organizations for which the cloud may be inappropriate and to prevent breaches, outages, negative financial impact, legal and compliance issues among many other ramifications that negatively affect organizations and their customers.

Cloud services are an innovative technology that reduces the footprint of data centers and the proliferation of hardware. This contributes positively to the environment by limiting the amount of energy needed to run the datacenters and servers. This makes cloud computing green technology (Samani et al., 2015).

The cloud services industry has created a career path for IT staff who were skilled in building and maintaining data centers everywhere. This shift to a virtual cloud paradigm has created new sets of skills needed to support the increasing expansion of the cloud industry. These skill sets are both in security, infrastructure, and (Erl et al., 2013).

Successful adoption of cloud services promotes quick to market offerings. Companies can increase capacity quickly to build software to support various social and economic activities. Traditionally, the time it took to deploy code, test, and implement for the final user took several months and, in some cases, years. With cloud services, from the phase of idea conception to the final phase deploying an IT system or software is significantly shortened. With speed to mark and convenience of use, small businesses should consult a framework for cloud adoption that suits their unique circumstances.

Frameworks in the existing literature often focused on a list of factors that tended to be a standard list without a focus for small businesses and their peculiar needs but rather from the perspective of the cloud providers and what they have to offer. This study lays the foundation for a future study for a cloud adoption framework for small businesses that identify the unique requirements that are pertinent for small businesses in including training needs and innovative ways of enhancing competitive advantage. Analyzing the responses to explore the processes for decision-making led to identifying the gaps that affect decision-making in a way that aligns with the expectations of the cloud providers. Cloud services provide an avenue for reducing the environmental footprint. This positive social change was extended by regulatory requirements that have been established since 2010 with the advent of ISO 26000 (Ross & Blumenstein, 2013).

The Strategic Decision-Making Model provides an elaborate road for making decisions (Mintzberg et al., 1976). The prescribed path of recognition, development, and selection with its attendant sub-processes enables organizations to make the right decisions. Applying that model as a conceptual framework to this model exposed weaknesses in the way small businesses make strategic decisions and highlighted the fact that cloud providers, on the other hand, follow a rigorous model in their use of cloud services and also how they expect cloud users to consume their services.

There is also positive social change when internal staff is retrained on new technology to advance their careers instead of being left to work on obsolete technology. This improves the morale of the workers, which in turn leads to productivity. They can participate effectively in future cloud adoption decision-making to improve the chances of success with cloud adoption. When the internal staff is retrained, and they contribute to strategic decision-making, it enhances the culture change and staff buy-in.

Having an in-depth understanding of the challenges that confront companies when they adopt cloud services can save companies from security breaches and that have impacted so many companies, including total bankruptcy and reputation loss.

The positive social change also transpires with increased environmental sustainability, the security of system integration, reduced hardware, software, and equipment requirements that result in the reduction of energy consumption. Cloud technology implementation provides quick solutions and convenient access for organizations. Social responsibilities identified in ISO 26000 indicate that the stakeholder

in the organization must receive prioritization in achieving cloud adoption goals (Samani et al., 2015).

This study may also help cloud providers to assist cloud users to understand the full complements of all the features they have to offer and reduce IT sprawl, which tends to increase cost and overtime make cloud service. Cloud service may help small businesses save costs and stay profitable and enjoy the full benefits of cloud services.

Decision-making model can be further explored and applied to other areas of IT studies or management. The high level phases of identification, development and selection are applicable in strategic decisions that affect organizations. This study found areas where the cloud adoption decision-making aligned with the strategic decision-making. Even though they were not fully aligned, but it gave an overall path for decision making that can be built upon in future studies.

A framework to guide cloud adoption decision-making by small businesses has been limited. Limited literature exists to adequately align the strategic business targets with the knowledge of small business managers regarding the adoption of cloud services (Nkhoma, & Dang, 2013). The gap in the literature required an exploration of strategic decision-making processes in cloud adoption by small businesses. The interviews with the respondents who were leaders or held senior positions in their respective organizations yielded additional angles for the decision-making processes. Managers and decision-makers must adopt a MCDM technique because many uncertainties and nuances could lead to dire consequences. (Sohaib & Naderpour, 2017)

Conclusions

Cloud services adoption requires careful planning and analysis of alternatives to ensure the right services and features are deployed and supported. The process in decision-making also requires understanding the cloud services and what their implications are to enable the decision-makers to put in place adequate mitigating strategies to prevent failures that have bedeviled other companies who did not plan the adoption process well and paid dearly though business failures. The study was to look at how small businesses embark on the cloud adoption decision-making, identify the strengths and weaknesses in the process, and to expose them for future study.

The study covered the perspectives of small businesses that adopt cloud services and cloud providers who offer cloud services. There are significant gaps in the expectation of cloud providers in terms of the decision-making process and preparation. While the cloud providers had an elaborate framework for cloud adoption, the small businesses did not know any framework and lacked the requisite understanding of cloud services even though they used cloud services. One significant departure from the general trend was the small business that was in the technology industry, which provided training for the staff and leadership to equip them in the decision-making and had demonstrable experience and understanding of cloud services.

The participants in this study were business leaders and senior staff who had experience in cloud services adoption. Their responses provided the insights and the areas of weakness that need future study. The strategic decision-making model provided a framework for decision-making, which was used as the conceptual framework. The

phases include recognition, development, and selection. Though all small businesses start off acknowledging the value proposition of cost savings as a benefit of cloud services beyond the advertised benefits, they did not, in most cases, have a good understanding of the cloud services and the ramifications of the decisions. This meant that though they decided to adopt cloud services, it was done in an ad-hoc manner without following a prescribed framework. Without a framework coupled with limited understanding could result in not taking full advantage of the innovative features of cloud services to enhance competitive advantage. It also meant they were exposed to potential pitfalls because the challenges were not understood upfront and planned. Cloud computing is a sophisticated technology, and therefore even advertised benefits such as cost savings can turn out to be unattainable if not appropriately planned, as revealed in the study by the cloud providers that cloud services adoption can, in some cases, lead to an increase in cost instead of cost savings.

To enhance the success of the cloud adoption decision-making process, small businesses must have a framework suitable for small businesses and pursue a level of understanding of cloud services needed to support a successful cloud adoption process. There is a need for further studies into the success rate of technology companies against non-technology based small businesses that adopt cloud services. There was a very distinct gap between the technology-based company and the other small businesses in the areas of understanding cloud services and training. Though they did not have a formal framework had a good understanding of what service models they were interested in using and the benefits.

The promise of cost savings, innovation, quick to market, efficiency gains, agility, and enhanced security can all be realized by small businesses but with careful planning and understanding to ensure that the gains are long-lasting and enduring.

The leaders of the small businesses and the cloud providers provided responses that made this study unique in unearthing the difficulties in the decision-making process in cloud services adoption. It also showed the benefits that are expected but also highlighted the need for a formal framework, training, and careful management of the resource utilization in the cloud to prevent sprawl of services that result in increased cost.

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Appendix A: Guided Interview Protocol for Using a Cloud Service

This appendix contains guidelines for the interview. There shall be two interviews including an initial and a follow-up interview. The initial interview will be 1 hour at the premises of the company focusing on the profile of the company and the general understanding of cloud service. The follow-up interview will be 30 minutes either over the phone or in-person at the company premises focused on the decision-making process and the outcome of cloud service adoption.

Organization of the interview guidelines

Profile of the company

Question 1. What industry does your organization belong?

Question 2. What is the primary service or function of your organization?

Question 3. What cloud service does your organization use?

Question 4. Describe who performs your internal information technology functions?

Question 5. Describe the highest decision-making entity in your organization?

Question 6: What is your role and title in the organization?

Management understanding of cloud service

Question 7. What does cloud service mean?

Question 8. What are the benefits of cloud-based applications to your organization?

Question 9. What challenges or drawbacks have you experienced with using cloud-based applications

Question 10. How does your organization use a cloud service?

Question 11. How does cloud service enhance your competitive advantage?

Question 12. What makes you comfortable to store your data in the cloud?

Question 13. What training did you receive to gain a greater understanding of cloud service?

Decision-making strategy of cloud service

Question 14. What were the primary considerations in the decision to go to the cloud?

Question 15. What was your role in the decision to go to the cloud?

Question 16. Describe the formal framework you consulted in the decision-making process.

Question 17. What obstacles did you face in the decision to adopt cloud technology?

Question 18. What were the unforeseen factors the emerged during the decision-making process that was not known before?

The outcome of cloud service and recommendations

Question 19. What has been the positive outcome of cloud adoption?

Question 20. What has been the adverse outcome of cloud adoption?

Question 21. What have been the effects of cloud service on the internal IT staff?

Appendix B: Guided Interview Protocol for Cloud Service Providers

This appendix contains guidelines for the interview. There will be two interviews, including an initial and a follow-up interview. The initial interview will be 1 hour at the premises of the company focusing on the profile of the company and the general understanding of cloud service. The follow-up interview will be 30 minutes either over the telephone or in-person at the company premises focused on the decision-making process and the outcome of cloud service adoption.

Organization of the interview guidelines

Profile of the company

Question 1. What industry does your organization belong?

Question 2. What is the primary service or function of your organization?

Question 3. How does your organization use Cloud service?

Question 4. Describe who performs your internal information technology functions?

Question 5. Describe the highest decision-making entity in your organization?

Question 6: What is your role and title in the organization?

Management understanding of cloud service

Question 7. What does cloud service mean?

Question 8. What are the benefits of cloud-based applications to your organization?

Question 9. What challenges or drawbacks have you experienced with using cloud-based applications

Question 10. How does your organization use a cloud service?

Question 11. How does cloud service enhance your competitive advantage?

Question 12. What makes you comfortable to store your data in the cloud?

Question 13. What training did you receive to gain a greater understanding of cloud service?

Decision-making strategy of cloud service

Question 14. What were the primary considerations in the decision to go to the cloud?

Question 15. What was your role in the decision to go to the cloud?

Question 16. Describe the formal framework you consulted in the decision-making process.

Question 17. What obstacles did you face in the decision to adopt cloud technology?

Question 18. What were the unforeseen factors the emerged during the decision-making process that was not known before?

The outcome of cloud service and recommendations

Question 19. What has been the positive outcome of cloud adoption?

Question 20. What has been the adverse outcome of cloud adoption?

Question 21. What have been the effects of cloud service on the internal IT staff?

Appendix C: Data Collection Procedures.

I will initially reach out to 16 cloud service user companies and ten cloud service providers. The larger size of 16 companies for the cloud service user companies is because there are more cloud consumers than there are Cloud providers. The larger population size is to account for those who may turn down the interview request.

Procedures for data collection will consist of the following:

- Data to address research question questions will be collected primarily through the interviews and document reviews.
- Data will be collected at the respective offices of the participants through interviews and documents that will be provided.
- Emails will be sent to all participants requesting to meet and the topic of the discussion.
- Once approval is received, multiple appointments will be scheduled for the interview—one for the primary interview and the second as an opportunity for follow-up.
- I will personally conduct the interview assisted with an iPhone recorder
- Each participant will be interviewed at least once, and if necessary, a follow-up interview will be conducted for additional information.
- Each interview will last for 1 hour for the primary encounter and 30 minutes for the follow-up.
- Notes will be taken in addition to the voice recorder.
- Written notes will be compared with the recorded interview for accuracy and consistency.

All will be stored on an external drive and also in the cloud for backup.

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