Cape Peninsula
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MANAGEMENT ISSUES WITH CLOUD COMPUTING: A SMALL, MICRO AND MEDIUM ENTERPRISES PERSPECTIVE USING THE TECHNOLOGY, ORGANISATION AND ENVIRONMENT FRAMEWORK

by

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ABSTRACT

Cloud Computing (CC) can transform how small, micro and medium enterprises (SMMEs) do business by providing them with resources such as software, hardware and platforms to develop their own applications on a pay per use basis. CC offers advantages such as low cost, improved access to resources, scalability, no need for installation, upgrades and maintenance, improved communication, improved data storage, reduced need for information technology (ICT) personnel, automatic updates, anytime anywhere access, high availability and low infrastructure requirements etc. Although CC has many benefits that SMMEs can enjoy, it also has limitations, and these limitations are preventing SMMEs from adopting CC. One of the main reasons why SMMEs are reluctant to adopt CC is their lack of awareness of the benefits and limitations of CC and how to reduce or avoid these limitations. This research identified the benefits and limitations of CC to create awareness among SMMEs, specifically Financial Service Providers (FSPs) and assist them to find ways to avoid the limitations.

The usage of CC among FSPs is still low, and the FSPs currently using CC are using it mainly for general business activities while their core business activities are still performed using legacy systems. This research also found that FSPs have no training programmes in place to provide their employees with the needed skills to use CC effectively.

The various service models of CC were also discussed in detail in this research. It was found that SaaS is the standard service model among the participating FSPs, and none of the participating FSPs is not using PaaS.

This research collected data using interviews to provide answers to the research questions; the data was analysed using thematic analysis.,

This research resulted in a framework being developed, referred to as ‘FSPCLOUD’, that aims at assisting FSPs in their adoption, implementation and continued use of CC. If the FSPs can successfully implement FSPCLOUD, it can improve their chances of implementing CC successfully.

Keywords: Cloud Computing, CC, Financial Service Providers, FSPs, SMME, adoption, use, implementation, financial institutions, SMECLOUD, service providers, organisations, management, lack, skills, management issues.

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ABBREVIATIONS

Abbreviation/Acronym	Explanation
BCDR	Business Continuity and Disaster Recovery
BI	Behavioural Intention
CC	Cloud Computing
CPU	Central Processing Unit
CPUT	Cape Peninsula University of Technology
EE	Effort Expectancy
ERP	Enterprise Resource Planning Systems
FC	Facilitating Conditions
FSP	Financial Service Providers
GDP	Gross Domestic Product
IaaS	Infrastructure as a Service
ICT	Information and Communication Technologies
IEEE	Institute of Electrical and Electronics Engineers
LE	Large Enterprise
NIST	National Institute of Standards and Technology
PaaS	Platform as a Service
PE	Performance Expectancy
RAM	Random Access Memory
RQ	Research Question
SA	South Africa
SaaS	Software as a Service
SARS	South African Revenue Service
SE	Small Enterprise
SI	Social Influence
SLA	Service Level Agreement
SMMEs	Small, micro and medium enterprises
RSQ	Sub Research Question
TOE	Technology, Organisation and Environment

VPN	Virtual Private Network

GLOSSARY OF TERMS

Terms	Definition/Explanation
Adoption	Adoption is the use of an innovation as the best course of action. Adoption is “a decision by the SMMEs to use internet-based ICT to communicate and otherwise conduct businesses with the stakeholders” (Tan et al., 2009:228).
Business continuity and disaster recovery	"Business continuity planning is a methodology used to create and validate a plan for maintaining continuous business operations before, during, and after disasters and disruptive events." "Disaster recovery plan is part of business continuity and deals with the immediate impact of an event." (Moşteanu, 2020:173)
CC	Cloud computing (CC) is “a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.” (Mell & Grance, 2011:2). In this research, CC adoption is the use of CC by SMMEs to conduct business activities such as communication, customer relationship management, human resource management, customer invoicing, and storage.
Development platforms	A development platform is a suite of software that allows businesses to build, test, and deploy applications (Rouse et al., 2017). In this research development platform refers specifically to the development of CC applications.
Diffusion	Diffusion is the process by which an innovation such as new ideas, application, product and technologies are delivered or communicated through various channels over time among the members of a social system who are the potential adopters (Robertson, 1967; Akça & Özer, 2014; Kiwanuka, 2015).
FSPs	Financial service providers (FSPs) are businesses that are licensed by the Financial Service Board and are allowed to service clients with financial advice in terms of assets management, loans, short- and long-term insurance as well medical insurance to name a few.
ICT	Information and communications technologies (ICTs) is a term used to describe technologies that allow users to access, acquire, store, process and transmit information (Steinmueller, 2000) for example, Skype, Google Drive, SkyDrive and Office 365.
Implementation	Implementation is “the process that begins with the managerial decision to install a computer-based organizational information system and is complete when the system is operating as an integral part of the organization’s information system.’’ (Zhanga et al., 2005:56). In this research, implementation is the process that begins when the management of FSPs decide to adopt CC and is complete when CC is

	operating and becomes an integral part of the FSPs information system.
Innovation	Innovation is an idea, practice, or object that an individual perceives to be new (Dibra, 2015; Peng & Vlas, 2017).
Management Issues	The management issues with CC refers to the problems or obstacles faced by FSPs in their adoption, implementation, and continued use of CC for their day to day business activities.
Readiness	Readiness is the availability of needed organisational resources to adopt a new technology (Vaidya et al., 2005). Readiness is the ability of an organisation to successfully adopt, use, and benefit from a new technology (Fathian et al., 2008). In this study, CC readiness is the availability of needed CC supporting technologies and other organizational resources that can aid FSPs to adopt, use, and benefit from CC successfully.
SMME	In RSA, the National Small Business Act classifies business enterprises as follows: Small enterprises have fewer than 50 employees, less than R10 million annual turnover and less than R3 million gross asset value. Micro enterprises have fewer than five employees, less than R500 000 annual turnover and less than R100 000 gross asset value. (Abor & Quartey, 2010; Mohlameane & Ruxwana, 2013; Cant & Rabie, 2018). Medium enterprises have between 100 to 200 employees (depending on industry), less than R25 million annual turnover and less than R8 million gross asset value.
SLA	A service-level agreement is a commitment between a service provider and their customer in which issues like the quality of service, availability and responsibilities are agreed. The remedies in case of a breach of the agreement by either party are also agreed.
Virtualisation	Virtualisation technology isolates and abstracts low-level resources and provides resources that are virtualised for high-level applications. For example, several virtual machines can be abstracted from a single physical machine. Resources can be dynamically assigned and reassigned to the virtual machines on demand (Zhao et al., 2014).

CHAPTER 1

INTRODUCTION

1.1 Introduction

The contributions of small, micro and medium and enterprises (SMMEs) are essential for the economy of a country (Ming et al., 2018) and they are regarded as the foundation of an economy that is flourishing (Kamath & Arjunan, 2018). The government of South Africa (SA) has identified SMMEs as important stakeholders towards the creation of jobs and growing the economy. SMMEs can only contribute to job creation and economic growth if their business is sustainable (Schutte & Direng, 2019). Their businesses also need to grow in order to create job opportunities and contribute to economic growth. Information and Communication Technologies (ICTs) continue to play an important role in the way organisations carry out their business activities (Mohlameane & Ruxwana, 2014). These ICTs provide organisations with opportunities to expand and increase productivity. The possibility of rapid expansion due to the use of ICT is one of the main reasons why organisations, especially SMMEs, are continuously adopting ICT. A detailed discussion of SMMEs is provided in section 2.1.

This research focuses on small enterprises (SE) in the financial industry, namely Financial Service Providers (FSPs), to uncover the management issues that they face in their day to day use of cloud computing (CC). As shown in sections 2.1 and 2.1.1, the terms “small, medium and micro” are well defined; however, SMMEs exist in almost all forms of commerce and industry, and it is not possible to include all of them in a study. Thus, the focus of this study is small FSPs that fit into the SMME definition.

FSPs are defined as financial service providers that are licensed by the Financial Service Board and are enabled to service clients with financial advice in terms of, for instance, assets management, loans, short- and long-term insurance, and medical insurance. Legislation around FSPs, for example, the Financial Advisory and Intermediary Services Act, 2002 (Act No. 37 of 2002; amended Board notice 146 of 2014; Government Gazette 38278), is becoming increasingly stringent as FSPs need to record all communication with a client, for inspection and further reference by, for instance, the client and compliance officers of the Financial Services Board. In this research, management issues with CC refer to the problems or obstacles faced by small FSPs in their adoption, implementation and continued use of CC for their day to day business activities.

The FSP sector was chosen because organisations in this category face increased volumes and complexity of data they store and process (Sharma, 2012). The large volumes of data usually mean that they have to purchase more resources like servers, computers and software. It also means that they have to employ more ICT staff to be able to maintain and service these resources. The continuous increase in the volumes of data and the resources needed to manage the data have left these FSPs with the need to be innovative and find alternate ways to access the needed resources

at minimal cost. CC is a technology that can provide these FSPs with the ability to scale up or down as the volume of their data increases or decreases (Sharma, 2012; Hassan et al., 2017). Many FSPs are turning to CC because of the possibility to access the needed resources on demand. FSPs also try to minimise cost as far as possible and as a result, need to avoid employing more ICT staff to service and maintain the resources. The CC service can now do this work. The increase in the interest of FSPs in CC motivated the need for this research to explore the management issues that the FSPs are facing as they continue to adopt and implement the CC strategy. This research will create awareness of CC among FSPs and assist them in understanding how to avoid and minimise the management issues of CC to guarantee successful adoption and implementation of CC.

ICT continues to play an essential role in the way organisations carry out their business activities (Mohlameane & Ruxwana, 2014). ICT provides organisations with opportunities to expand and increase productivity. The possibility of rapid expansion because of the use of ICT is one of the main reasons why organisations, especially FSPs, are continuously adopting ICT.

CC is an ICT which is transforming the way organisations do businesses. CC is a technological concept in which a service provider offers computing resources such as software, hardware, development platforms and applications to users on a pay-as-you-go basis. The service provider also caters for the installation, upgrades and maintenance of the resources offered, thereby relieving users from the burden of installation, upgrades and maintenance of ICT resources. Chapter 2 includes a detailed discussion of CC.

CC is a fast-growing technology that provides access to infrastructure, software and development platforms for users on a pay-as-you-go basis (Hentschel et al., 2019). Thus, FSPs can make use of infrastructure, software and development platforms while only paying for what they use. CC provides them with the opportunity to maximise usage and minimise wastage of resources. Because of the promises of CC to transform business and create growth opportunities, more and more FSPs continue to explore this avenue by adopting CC (Mazumdar & Alharahsheh, 2019; Sandu & Gide, 2019). The lack of knowledge of new ICT, its potential and possible business impact make it difficult for FSPs to evaluate and manage new ICT (Afolayan, 2014). The lack of proper understanding of the issues and challenges of CC could be a potential setback for FSPs. The disappointment they may experience when encountering any of the limitations of CC may affect their ability to use CC effectively and may prevent them from reaping the expected benefits of CC (Mazumdar & Alharahsheh, 2019). These limitations can be security and privacy issues, over-reliance of CC on the internet, lack of expertise in-house, resistance to change, the possibility of data lock-in, the possibility of malicious insiders, legislation and compliance issues, and service migration issues (Kreslins et al., 2018; Chong, 2019). Other limitations include ICT policy, capability, data control and systems integration issues (Ilyihamije, 2018). Refer to section 2.2.5 for further discussion of the limitations (disadvantages) of CC.

This research endeavours to provide FSPs with a better understanding of CC management issues by identifying the benefits and the limitations and suggesting how to overcome or avoid the limitations to minimise the risks and maximise the benefits of CC. This research suggests that a better understanding of the management issues of CC can equip FSPs on how to manage such issues and minimise the risks that may arise from them. Hence, this research explores the management issues that FSPs encounter in their day to day use of CC as these issues may impede their ability to implement and utilise CC successfully.

This research attempts to provide FSPs with a better understanding of CC by identifying the management issues in the adoption, implementation and use of CC. A better understanding of the management of CC and its associated issues can assist FSPs in making decisions and formulating effective strategies with regards to the adoption, implementation and use of CC.

1.2 The problem statement

FSPs are not operating efficiently and are unable to reach their potential and compete against large organisations (Ahmad & Siddiqui, 2014; Yeboah-Boateng & Essandoh, 2014; Friedrich-Baasner et al., 2018; Kreslins et al., 2018; Mohammed & Burhanuddin, 2018; Gamage, 2019; Stentoft et al., 2019). The opportunity to grow evades many of the FSPs because they face financial issues which prevent them from being able to engage in activities such as marketing, advertising and use of ICT (Yeboah-Boateng & Essandoh, 2014). FSPs also lack access to training facilities to provide the owners with management skills needed to drive the organisation towards the desired growth (Gamage, 2019). Despite the growth in the adoption of CC by FSPs, financial issues, the lack of management skills and ICT resources makes it difficult for FSPs to manage CC effectively (Kreslins et al., 2018). The availability of cheaper ICT for FSPs, such as CC, can assist them with overcoming this problem and allow them to expand their business activities and grow as expected (Mazumdar & Alharahsheh, 2019). The owners of FSPs should not allow the benefits that CC promises, overshadow their ability to investigate the negative aspects of CC. Their inability to determine the FSPs readiness for CC adoption and to evaluate CC may lead to implementation failure (Ilyihamije, 2018). Furthermore, FSPs are struggling with management issues and neglect the limitations of CC (Asirvatham & Ayoobkhan, 2018). Unfortunately, very little has been written in the academic literature concerning the management issues that FSPs are experiencing with CC.

The problem statement: FSPs are unable to reach their full potential and to compete with large organisations because of their management issues with CC, which prevent them from operating efficiently.

1.3 The research questions and sub-questions

Table 1.1 shows the research questions (RQ) and research sub-questions (RSQ). It further indicates the methods used for finding answers to the RSQs as well as the objectives of each question.

Table 1.1: The research questions and sub-questions

Research Question 1	**What are the issues associated with CC management for FSPs?**	
Research sub-questions	**Research Method(s)**	**Objectives**
RSQ 1.1 What are the benefits of CC for FSPs?	Literature review and thematic analysis of the data obtained through semi-structured questionnaires.	To identify the factors that attract FSPs towards CC.
RSQ 1.2 What are the challenges faced by FSPs in their adoption and implementation of CC?	Literature review and thematic analysis of the data obtained through semi-structured questionnaires.	To identify the challenges management faces when adopting and implementing CC.
RSQ 1.3 What management tools do FSPs use when managing the complexities of CC?	Literature review and thematic analysis of the data obtained through semi-structured questionnaires.	To determine which tools FSPs use to ensure effective utilisation of CC.
Research Question 2	**How can CC management challenges be minimised when considering CC solutions for FSPs?**	
Research sub-questions	**Research Method(s)**	**Objectives**
RSQ 2.1 How can a set of best practices and governance protocols assist FSPs with challenges faced when using CC?	Literature review and thematic analysis of the data obtained through semi-structured questionnaires.	To determine a set of best practices and governance protocols that can assist FSPs in their use of CC. To propose a best practice and governance protocols to assist FSPs in managing CC.
RSQ 2.2 How does FSPs management combat the challenges faced during the adoption and implementation of CC?	Literature review and thematic analysis of the data obtained through semi-structured questionnaires.	To identify the available strategies used by FSPs to reduce the risks associated with CC adoption and implementation.

1.4 The aim of the research

The research aims to explore the factors affecting the management of CC in FSPs.

1.5 The objectives of the research

The objectives of this research are to identify the management issues and limitations that FSPs are facing in their adoption and implementation of CC. A further objective is to propose a framework for FSPs to assist them in the management of the adoption and implementation of CC. In order to achieve this, the research attempts to uncover the benefits and disadvantages of CC for FSPs and to identify favourable conditions in which FSPs can adopt CC.

1.6 Research methodology

Chapter 3 presents a detailed discussion of the research design and the method employed in this research. This study follows an inductive approach which has allowed the researcher to understand the phenomenon of interest, based on the perspectives of the participants. This approach has allowed the researcher to develop the framework (FSPCLOUD) from the findings and observations from the interviews. This research follows a subjective ontological stance which enabled the researcher to be fully involved in the research and be able to view the world from her own perspective. The researcher adopted an interpretive epistemological stance which allowed her to explore the subjective meanings motivating the actions of FSPs owners and other stakeholders to provide her with a better understanding of their actions. This research collected data through semi-structured interviews using a non-random purposive sampling method. The unit of analysis of this research was the participating FSPs, and the units of observation were the owners and ICT managers of the FSPs. The validity of the data collected during the interviews was achieved by transcribing the taped interviews and sending the transcripts to the respective participants to ensure that they accurately reflected what arose during the interviews.

1.6.1 Research Philosophy

Research philosophy involves the ontological, epistemological and axiological stances that a researcher takes while conducting research.

Ontology concerns the assumptions made about reality (Bilau et al., 2018), and has two aspects-objectivism and subjectivism. Objectivists believe that reality is external to social actors, while subjectivists believe that reality is socially constructed (Kelly, 2018). This research follows a subjective stance because the researcher believes that reality is socially constructed.

Epistemology is concerned with how knowledge is created and how that knowledge is affected by a researcher's bias (Hirschheim & Klein, 1994; Janse van Rensburg & Goede, 2019). A researcher can employ either an interpretive, positivist or critical stance (Goldkuhl, 2012; Nazri et al., 2019). The

interpretive researcher believes that reality is subjective and attempts to understand the differences between humans in their roles as social actors. The positivist researcher believes that reality is objective and that only observable phenomena can lead to the production of data that is reliable and credible. Interpretivism relies mainly on qualitative data, while positivism relies mainly on quantitative data (Johnson et al., 2018). This research adopted an interpretive epistemological stance as the researcher interpreted the data obtained from the interview participants and attempted to make some claims about reality based on her interpretation of the data.

Axiology deals with the researcher's judgement based on value (Bell & Bellon, 2018). A researcher's personal value, beliefs, and experiences can affect the outcome and credibility of research, and this explains why different researchers conducting a similar study may arrive at different conclusions.

1.6.2 Research Approach

A research project can lead to the creation of a new theory or the validation of an existing theory. The two commonly used approaches are the inductive and deductive approaches (Bilau et al., 2018; Tian, 2018). The inductive approach involves the creation of new theory from data while the deductive approach involves the validation or contradiction of an existing theory. This research employs the inductive approach, and a new framework called "FSPCLOUD" (Chapter 5) was developed from the data obtained from the interviews. The Technology, organisation and environment (TOE) framework, and existing literature, were used as a guideline while developing the new framework. The framework is the contribution to the body of knowledge and has not yet been tested.

1.6.3 Research Strategy

The research strategy determines the way the data will be collected and analysed (Myers, 2009). A multiple case study has been used, with twenty-two FSPs selected using non-random, convenience and purposive sampling.

Data was collected from selected participants within the FSPs using interviews. The use of interviews allowed the researcher to address all the research questions in an unbiased manner. Interviews were conducted with thirteen owners and nine ICT managers (where the owners were not available) from the participating FSPs. The interviews were recorded electronically with permissions from the participants and their organisations, and the recordings were later transcribed.

1.6.4 Unit of analysis

The units of analysis in this research were the participating FSPs as the research is aimed at the issues their management face when managing CC.

1.6.5 Unit of observation

The units of observation in this research were the owners of the participating FSPs or their ICT managers in cases when the owners were not available.

1.7 Data collection

There are many data collection methods, for instance, archival research, action research, ethnography, grounded theory, case study, experiment and survey (Myers, 2009). Data was collected using a semi-structured questionnaire as detailed in the interview guide (Appendix D). The interview guide contains 30 questions. The planned duration of each interview was 45 minutes, although some lasted 90 minutes (by mutual consent) owing to the level of engagement of the interviewee. The interviews were recorded and later transcribed for data analysis. Transcriptions were typed up and emailed to individual participants in order for the participant to check the reliability and to validate transcriptions to confirm with the participant that the transcriptions represented the information (the truth) as the participant intended it to be. The participants were reminded that they were still free to withdraw or change any statement or even withdraw from the research project entirely.

1.8 Sampling

A total of twenty-two interviews were conducted – one per FSP (section:3.4). The participants were selected based on their role in ICT decision making of their organisations and their knowledge of CC and were either the owners of the selected FSPs or the ICT managers thereof. The researcher ensured that the selected participants were directly involved with their organisation's ICT decision making and were knowledgeable about CC, thus allowing the researcher to obtain rich, in-depth data from the participants.

1.9 Data Analysis

A thematic analysis of the transcribed data was conducted. A qualitative research tool called Atlas.ti was used in the analysis stage to improve the quality of the analysis. Based on the outcome of the data analysis and using the TOE framework as a guideline, the researcher developed the proposed framework (FSPCLOUD), which can assist FSPs in their adoption and implementation of CC.

1.10 Ethics and Confidentiality

The researcher considered the ethics and confidentiality issues relating to this research from the beginning of the research. Throughout the research process, the researcher acted with integrity and adhered to the required and recommended ethical principles and standards that are essential for this research. The researcher is aware of the ethical considerations relating to potential stakeholders of this research, namely:

- Informed consent – the researcher obtained the participant's consent to the research in which they are taking part and explained the content.

- Collecting data from the participants – the researcher made sure that the participants were comfortable with the environment and questions and acted appropriately and ethically.

- Dealing with sensitive information – the researcher dealt with sensitive information ethically.

- Provide incentives – no incentives of any kind were offered to the participants.

- Avoiding deception – the researcher ensured that there was no deception while collecting or analysing the data.

- All electronic interview recordings and transcripts are kept securely using encryption.

- All data has been reported and analysed fairly and without bias.

Informed consent forms were sent to the participants to inform them of their rights. For example, the participants were informed that their participation was voluntary, and they could withdraw their participation at any stage during the interview should they wish to do so. Furthermore, participants were given the opportunity to check the transcriptions in order to validate the data. At this point, the participants were free to withdraw from the research. Approval was sought and received from the ethics committee at CPUT (Appendix A2) and the management of participating FSPs (Appendix H).

1.11 **Findings**

Chapter 4 contains a detailed discussion of the findings. Some of the main findings are:

- FSPs lack in-house expertise, and this is one of the management issues that prevent them from using CC for their core business activities.

- In contrast to literature which found that top management support is lacking in FSPs for CC adoption, this research found that there is top management support in the participating FSPs, and the availability of top management support is an enabler of CC.

- The high cost of internet services is a major management issue faced by the participating FSPs.

- There is no systematic or strategic approach for implementing CC among the participating FSPs.

- The low confidence of the FSPs in the service provider regarding the security of their data has not deterred FSPs from implementing CC.

1.12 Conclusion and Recommendation

The adoption of CC among FSPs is low, and management faces many issues. The low usage is a surprising finding as it was expected that usage among FSPs would be high due to the low cost of entry of CC and its ability to provide FSPs with latest technologies. There is a need for FSPs to provide training for their employees to equip them with CC skills as this could reduce employee resistance and improve CC implementation.

1.13 Contributions of the research

1.13.1 FSPs

The outcome of this research may provide FSPs with a better understanding of CC, its benefits and limitations. The proposed framework can guide FSPs in their adoption, implementation and maintenance of CC, and may provide FSPs with the knowledge to mitigate possible problems due to the limitations of CC. The framework can lead to an increase in the success of CC implementation among FSPs and lead to the creation of jobs while also contributing to improved economic growth.

1.13.2 South Africa

SA can benefit from this research in several ways. Firstly, the creation of employment and improved economic growth as a result of the successful implementation of CC by FSPs. Secondly, the assistance provided for FSPs by the government in terms of funding can be maximised and used effectively. A proper understanding of CC by FSPs means that they can be able to use it effectively and avoid unnecessary expenditure by only paying for what they use.

1.13.3 Research Community

This framework developed in this research contributes to the existing body of knowledge, especially in the area of CC in FSPs. The framework can also create an avenue for further research as researchers will be able to validate the framework and be able to use it to investigate further how CC can contribute to the growth and sustainability of FSPs. Researchers can also be able to apply the framework in other research areas.

1.14 Assumptions, limitations and expected difficulties

This research assumes that the FSPs are using a variety of forms of CC, and as a result, the participants should be able to answer all the questions that they will be asked during the interviews.

One of the possible limitations of this research was that there is limited research in this domain as most of the available literature in this area concentrate on the benefits, adoption, process of implementation, security, service level agreement (SLA) of CC. Only a few researchers have looked

into the issues faced by FSPs management in their implementation of CC. Another limitation of this study was the difficulty in gaining access to the relevant stakeholders from participating FSPs for the interviews. Also, the limited time available for this study has been another limitation of this study because this study was part of the requirements for the completion of a Master of Business Administration (MBA) degree which has a stipulated timeframe for completion (Appendix E).

1.15 Summary

The continuous changes in technology and the high cost of traditional in-house technologies is forcing FSPs to consider CC. FSPs are unable to reach their potentials and compete with large organisations because of the lack of management skills to manage CC issues, preventing them from maximising operational efficiency.

This study attempts to answer two main research questions which are:

RQ1 What are the issues associated with CC management for FSPs?

RQ2 How can CC management challenges be minimised when considering CC solutions for FSPs?

This research followed a subjective ontological stance because the researcher believes that reality is socially constructed. Furthermore, this research adopted an interpretive epistemological stance as the researcher interpreted the data obtained from the interview participants and attempted to make some claims about reality based on her interpretation of the data. This research employed an inductive approach.

Twenty-two interviews were conducted with owners and ICT managers within the selected SMME FSPs, and the data was analysed using the thematical analysis approach assisted by the Atlas.ti software tool. A new framework called “FSPCLOUD” was developed from the data obtained during the interviews.

Ethics and confidentiality issues relating to this research were considered. The researcher provided the participants with an informed consent form (Appendix C) and informed them of their rights. In addition, the researcher obtained ethics approval from the ethics committee at CPUT (Appendix A2) as well as the management of participating FSPs (Appendix H). The approval letter from the management of one the FSPs is provided in Appendix H. The information of the FSP and their staff has been redacted from the letter to ensure the confidentiality of all, as agreed with the participants.

This research found that security and privacy are among the top issues preventing FSPs from fully implementing CC. The high cost of internet in SA was also found to be an impeding factor for FSPs. SaaS was found to be the most common CC offering used by the participating FSPs. A full discussion of the findings can be found in Chapter 4.

In conclusion, the adoption of CC is still low among FSPs as they are not fully aware of CC, its benefits and limitations. The improvement of security and privacy in CC and increased CC awareness can improve the adoption, implementation and use of CC among FSPs.

1.16 Outline of the thesis

This thesis comprises of six chapters. The layout of the thesis is presented as follows.

Chapter One: The first chapter of this thesis provides: the introduction; the problem statement; the research questions and sub-questions; the research aim and objectives; the research methodology; the data collection technique and sampling; the data analysis technique; and ethics and confidentiality. The findings are also presented in chapter one, along with the expected contributions of this research for FSPs, South Africa and the research community. The assumptions, limitations and expected difficulties of this research are also discussed in this chapter.

Chapter Two: This chapter presents a review of the existing literature relevant to this research. The different classifications of enterprises in SA were discussed. The history of CC, the definition of CC and the different types of CC are also discussed. This chapter also presents the advantages and disadvantages of CC based on existing literature as well as the factors that both attract SMMEs to CC and also prevent SMMEs from adopting. In addition, chapter two discusses the cloud delivery models, related technologies, CC and SMMEs, SMMEs and the management of CC and theories considered for this research.

Chapter Three: An in-depth discussion of the research design and methodology is presented in this chapter. The research philosophy, approach and strategy are discussed in depth in this chapter, as are the processes of data collection, data analysis, the resources used for this research and a further discussion of the ethics and confidentiality issues relating to this research are also provided in this chapter.

Chapter Four: The profile of the participating FSPs are provided in this chapter. A detailed discussion of the data analysis and findings are also presented in this chapter.

Chapter Five: The themes that emerged from the research findings of chapter four are presented and discussed in this chapter. The findings of this research are discussed relative to existing literature and the research questions (section 1.3). This chapter also provides answers to the research questions.

Chapter Six: This chapter provides the conclusion of the research and recommendations. The theoretical, practical and methodological contributions of this research are discussed, and finally, the last section of this chapter presents self-reflections and suggestions for future research studies.

CHAPTER 2

LITERATURE REVIEW

As a reminder for the reader, the problem that this thesis addresses is:

FSPs are unable to reach their full potential and to compete with large organisations because of management issues with CC and as a result, prevent them from operating efficiently. The research aims to explore the factors affecting the management of CC in FSPs.

To conduct the literature review, the researcher derived keywords such as CC, FSPs, SMME, adoption, usage, implementation, financial institutions, service providers, organisations, management, lack, skills and management issues from the problem statement, research questions and the aim of the study. Google Scholar was the primary search engine used, and extensive use was made of the CPUT online libraries, especially the ACM Digital Library, ScienceDirect, IEEE Xplore, JSTOR, Springer, Emerald, CPUT dissertations and thesis, EBSCOhost, and Academic OneFile.

There is a growing interest among organisations, especially SMMEs/FSPs, to look for more cost-effective ways of accessing ICT infrastructure, development platforms, service, and applications (Paquette et al., 2010). The adoption of CC by the SMMEs is increasing steadily with the number of SMMEs using cloud services in SA increasing from 9% in 2012 (World Wide Worx, 2014) to 29% in 2014, 39% in 2015 (Pazvakavambwa, 2015). CC is one of the technologies that organisations are turning to because of its promises, such as cost reduction, flexibility, scalability, accessibility and its swift and easy deployment (Christauskas & Miseviciene, 2012; Yeboah-Boateng & Essandoh, 2014). The need for organisations to reduce costs to leverage technology in order to remain competitive is another reason why they are turning to CC (Carew, 2014).

2.1 Classification of Enterprises in South Africa

Three parameters are used to classify organisations as either small, medium, micro, or large enterprises in SA, namely the number of employees, the annual turnover, and the gross movable assets (Cant & Rabie, 2018).

2.1.1 SMMEs

There are different definitions of SMMEs, depending on the country or economy concerned (Abubakar et al., 2014). In SA, the National Small Business Act classified organisations with fewer than 50 employees, less than R10 million annual turnover, and less than R3 million gross asset value as small enterprises. Organisations with fewer than five employees, less than R500 000 annual turnover, and less than R100 000 gross asset value are classified as micro-enterprises. Organisations having between 100 to 200 employees (depending on industry), less than R25 million

annual turnover and less than R8 million gross asset value are classified by the National Small Business Act as medium enterprises (Abor & Quartey, 2010; Mohlameane & Ruxwana, 2013; Cant & Rabie, 2018). The annual turnover of the SMMEs should be less than R4 million to R50 million (depending upon industry). Their capital asset should be less than R2 million to R18 million (depending on industry), and the owners should be directly involved in a managerial level.

SMMEs contribute to the reduction of unemployment (Peprah et al., 2016) and they are very effective in contributing to job creations and economic growth (Abubakar et al., 2014; Gamage, 2019). For example, Gupta et al. (2013) found that in Singapore SMMEs contribute 46 per cent to Singapore's Gross Domestic Product (GDP) and employ 63 per cent of the workforce; in the European Union, SMMEs provide two-thirds of the jobs; and in Japan, the figure is 78 per cent. This shows the importance of SMMEs in job creation and economic development and reiterates the need for SMMEs to acquire resources such as CC that will assist them in running their business effectively and drive them towards growth and expansion. Some of the CC services used by SA SMMEs are as follows:

- 83 per cent use it for email services.
- 47 per cent use it for backups.
- 37 per cent use it for accounting1
- 27 per cent use it for project management.
- 25 per cent use it for customer relationship management. (Ventureburn, 2015).

The adoption of CC by SMMEs highlights the need for SMMEs to understand the benefits and limitations of CC and be more aware of all the issues associated with the implementation of CC to guarantee a successful implementation.

The majority of SMMEs have fewer resources when compared with large organisations and are, therefore, unable to compete with larger organisations (Stentoft et al., 2019). The use of CC can assist FSPs to remain competitive because it can provide them with access to technological resources that they would not usually be able to afford. CC can allow them to remain competitive and be able to compete with bigger organisations that are more established in the market. A proper understanding of CC, and especially its benefits and limitations, can assist FSPs to implement CC effectively.

2.2 Cloud computing

2.2.1 History of CC

The foundations for CC were laid 1960 when Joseph Carl Robnett Licklider enabled the development of The Advanced Research Projects Agency Network (ARPANET), which is similar to what is now known as the Internet (Timmermans et al., 2010). The vision of John McCarthy in the early 1960s that computation may someday be organised as a public utility like water or electricity is also attributed to what led to the emergence of CC and is regarded as the underlying concept of CC (*ibid*).

The history of CC can also be traced to the days when telecommunication companies began to offer virtual private network (VPN) services which allowed them to switch traffic to balance the utilisation of the overall network. This has now extended by CC to cover servers and network infrastructure (Jadeja & Modi, 2012). CC has evolved from the days of grid computing and utility computing in the '60s to the days of the internet being used as a mechanism to provide applications as a service. It was in 2007 that the term CC began to gain popularity (Inamdar & Gursoy, 2019), and by 2009 organisations started using cloud structure to serve their ICT needs (Attaran & Woods, 2018).

2.2.2 **Definitions of CC**

There are different definitions of CC, depending on the type of CC under investigation. The definition by NIST was selected for this research because it covers all the aspects of CC, including the delivery models and types of CC (deployment models). The definition is as follows:

"[CC is] a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction" (Mell & Grance, 2011:2).

The abovementioned resources can be quickly established and released with little or no effort from management or the service provider (Canedo et al., 2012). CC is one of the newest ICT innovations in which both hardware and software are delivered to customers over a network using any internet-enabled device at anytime from anywhere (Liu et al., 2018).

2.2.3 **Types of CC**

The lack of awareness of the management issues with CC is not the only reason why organisations fail in their adoption and implementation of CC (Chauhan et al., 2012). Another reason is that they are unable to select the right type of CC that meets their business requirements. FSPs need to understand that different types of CC require different resources and expertise for implementation. FSPs should select the type of CC to adopt based on their resources, level of expertise, and business requirements. There are four types of CC, namely: private; public; hybrid; and community clouds (Akande et al., 2013, Sunil et al., 2020).

1. In a private cloud, the servers and other resources belong to a particular organisation and are dedicated for the sole use of that organisation (Ghanbari et al., 2012; Akande & Van Belle, 2014). The resources could be managed by the organisation or a third-party service provider appointed by the organisation. This type of cloud provides more security and control over data for the organisation.

2. The public cloud is different from the private cloud in the sense that the resources are owned by the service provider who provides shared access to users on a pay-as-you-go basis (Zissis & Lekkas, 2012).

3. The hybrid cloud is a combination of two or more different types of CC. For example, an organisation could decide to migrate confidential data to a private cloud which gives them more control over the data and migrate the less confidential data to the public cloud (Li et al., 2018).

4. The community cloud is a type of cloud in which several organisations in the same line of business who share similar goals and objectives shares the cloud infrastructure (Malik et al., 2018). Figure 2-1 shows the different types of CC and how they relate with one another.

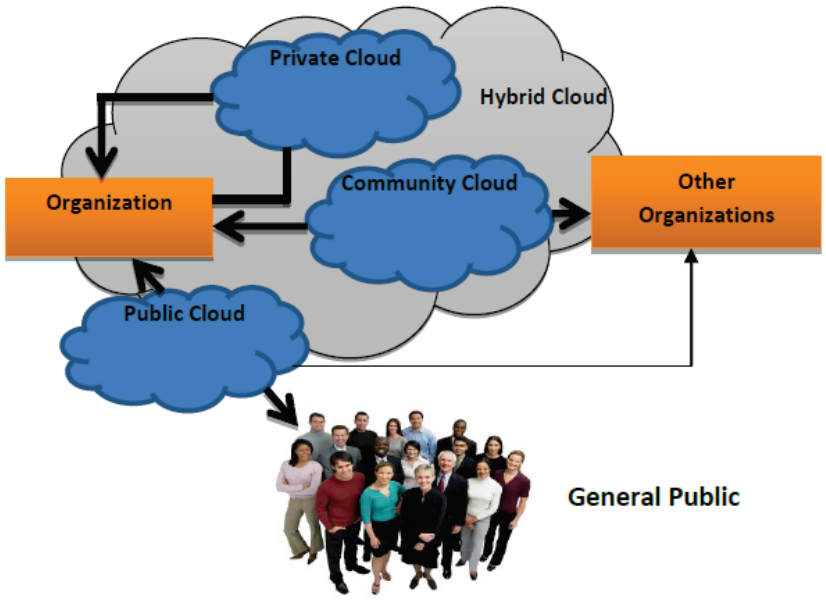

Figure 2-1: The Cloud Computing deployment models (Source: Kuo, 2011:4)

2.2.4 Benefits of CC

The budgets of FSPs are always limited when compared with those of large enterprises (Salleh et al., 2012). This makes CC attractive for FSPs in their bid to find cheaper ways of fulfilling their ICT needs. The main benefit of CC for FSPs is the reduction in the cost of acquiring, installing, maintaining and upgrading the software or application which makes it affordable for most FSPs (Bajenaru, 2010; Mohlameane & Ruxwana, 2013; Yeboah-Boateng & Essandoh, 2014; Ming et al., 2018, Shetty & Panda, 2020). Another benefit of CC for FSPs is the scalability of CC which can assist FSPs in time of expansion as new resources, such as employees, shops, offices and even factories, can be up and running in the minimum possible time. Other benefits include:

- low power consumption,

- low capital investment (Asirvatham & Ayoobkhan, 2018),
- accessibility (Sharma et al., 2010),
- unrestricted and enhanced data storage,
- increased data dependability,
- improved data redundancy,
- mobility in data access,
- reduction in operational cost,
- enhanced software development,
- enhanced data computation,
- availability of the latest version (Wang, 2013),
- quick data recovery,
- improved communication (Kreslins et al., 2018), and
- flexibility that enables FSPs to swiftly adapt to changing environmental requirements (Zabalza et al., 2012).

2.2.5 **Disadvantages of CC**

The lack of awareness of the benefits and limitations of CC is a limitation of SMMEs that hampers their ability to use CC effectively (Abubakar et al., 2014; Kreslins et al., 2018) which creates the perception that CC is an expensive technology to implement and maintain (Mohlameane & Ruxwana, 2013). As a result, they are unable to adopt CC. Exploring and understanding the benefits and limitations is important for the successful implementation of CC (Chong, 2019). The poor understanding of the value of CC by FSPs is another reason why FSPs fail in their implementation of CC (Carew, 2014). Other major challenges of CC are:

- privacy and security issues (Sharma et al., 2010; Abubakar et al., 2014) because the data privacy and security could be at risk due to the storage of data in different locations with different legislations (Al Isma'ili et al., 2020),
- continuity issues,
- service migration issues (Wang, 2013),
- legislation and compliance issues,
- switching cost (Kreslins et al., 2018),
- lack of top management support,
- compatibility issues (Al Isma'ili et al., 2020),
- the lack of necessary ICT skills (Carew, 2014),
- reliance on CC on the internet (Bajdor & Lis, 2014),
- performance and downtime issues,
- availability issues,
- cost of bandwidth (Akande et al., 2013; Yeboah-Boateng & Essandoh, 2014), and
- Interoperability issues (Ali & Soar, 2014).

2.2.6 Factors that attract SMMEs to adopt CC

Several factors attract SMMEs to adopt and implement CC. Some of these factors include the relative advantage or perceived benefits of CC. The support from top management and the level of technology readiness also affects the confidence of SMMEs while making decisions on whether to adopt CC. Other factors that attract SMMEs towards the adoption of CC are:

- technological business needs,
- organisational size,
- external pressure,
- environment uncertainties,
- the need for employees to be able to work on the go coupled with the convenience in accessing the applications,
- the need to increase computing capacity,
- greater ICT efficiency and agility,
- a much greener way of managing ICT,
- business continuity, back up and disaster management,
- avoiding capital expenditure in hardware and software, and
- maximising the utilisation of resources (Sahandi et al., 2013:5).

2.2.7 Factors that prevent SMMEs from adopting CC

Just as there are factors that attract SMMEs towards the adoption of CC, there are factors which prevent them from adopting CC. Apart from the issues with CC such as security issues, privacy issues and accessibility of data which hinders SMMEs from adopting CC. Other issues which prevent SMMEs from adopting CC and are directly related to the SMMEs themselves and are:

- The lack of understanding of CC: Majority of the SMMEs have no understanding of the infrastructure, cost, and how CC fits into their business activities (Mohabbattalab et al., 2014). Hence, they are not motivated to use CC.

- The lack of necessary ICT skills: The owners and staff of SMMEs lack the skills needed to use CC and are not aware of how to use the technology due to the low computer literacy among SMMEs owners and staff (Ahmad & Siddiqui, 2014). Higher levels of business uncertainty and the lack of internal staff expertise is, therefore, a hindrance for SMMEs when making CC adoption decisions (Mohabbattalab, von der Heidt, & Mohabbattalab, 2014; Hassan, Nasir, Khairudin, & Adon, 2017).

- The SMMEs readiness to adopt CC (Assante et al., 2016). A recent doctoral thesis by Tambe (2020) also found that organisational readiness for technology affects the viability of using CC technology.

- Lack of cloud-specific policies: The SMMEs lack financial powers and are unable to take on service providers in cases when there is vendor lock-in or a breach of agreement on the side of the service providers (Ahmad & Siddiqui, 2014).

- ICT Resources: The lack of basic ICT resources needed to implement CC prevents some SMMEs from adopting CC.

- External Pressure: The pressure from competitors and the environment affects SMMEs determination to adopt CC. For example, in a market where there is fierce competition and competitors are using the latest technologies to gain competitive advantage, SMMEs will be attracted to CC. However, if the competition is not intense, SMMEs may not see the need to adopt technologies such as CC.

To encourage SMMEs to adopt CC, the SMMEs users need to be educated and made aware of CC and the needed ICT skills when embarking on the CC route. A skilled component can improve their level of readiness to adopt CC and allow them to make an informed decision on how CC can be used to improve their business activities. It will also equip them in deciding on the type of CC to adopt and the type of CC service offering to implement depending on their business needs.

2.2.8 **Cloud Delivery Models**

There are different cloud delivery models, also known as service models. The most common ones are Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS) (Zissis & Lekkas, 2012; Akande et al., 2013). SaaS is the provision of software and other applications to users by a service provider over a cloud infrastructure. The users can access the software via a thin client over the internet without having to worry about the installation, maintenance or upgrade of the software as that is the duty of the service provider (Wang et al., 2011). Examples of SaaS are Google Apps, Microsoft Office 365, Gmail and Facebook (Zhou & Buyya, 2018). PaaS provides users with platforms to develop their own software and applications, and it promotes collaboration among developers as they can work on the same project from different locations using PaaS (Tsai et al., 2010). Examples of PaaS are Force.com, Apache StratosApp, Windows Azure and AWS ElasticBeanstalk (Malik et al., 2018). IaaS provides users with computing infrastructure such as processing power, networks and storage with which they can store, deploy and run the software and applications (Maurer et al., 2012; Akande et al., 2013). Examples of IaaS are Windows Azure, Rackspace, Amazon EC2 and Google Compute Engine (Malik et al., 2018).

2.2.9 **Related Technologies**

The decades of research in related technologies led to the emergence of CC. Distributed computing, virtualisation, utility computing and autonomic computing are some of the related technologies in which CC inherited some of its features and functionalities (Zhao et al., 2014).

2.2.9.1 *Grid Computing*

Grid computing, also referred to as distributed computing, coordinates resources that are networked to achieve a common computational objective. The resources may be present in different locations, and they can be used together to perform large and complex computations. Both grid computing and CC employ the use of distributed resources to achieve application-level objectives; CC further leverages virtualisation technologies to achieve on-demand sharing of resources and dynamic provisioning of resources (Zhao et al., 2014).

2.2.9.2 *Virtualization*

Virtualisation technology isolates and abstracts low-level resources and provides resources that are virtualised for high-level applications. For example, several virtual machines can be configured on a single physical machine. Resources can be dynamically assigned and reassigned to the virtual machines on demand (Zhao et al., 2014). With virtualisation, users can access servers or storage without knowing specific server or storage details such as the location of the server or storage. The difference between CC and virtualisation is that CC has an intelligent way of allocating and managing the demand for resources by customers.

2.2.9.3 *Utility Computing*

Utility computing refers to the idea of providing resources as a metered service in a similar way to the services offered by traditional public utility companies. It offers on-demand facilities and charges customers per usage instead of having a flat rate. Both utility computing and CC provides better economics and scalability because customers can get more resources as required on a pay-as-you-go basis. The service providers are also able to reduce their operating costs by maximising resource utilisation. CC is a realisation of utility computing (Zhao et al., 2014).

2.2.9.4 *Autonomic Computing*

Autonomic refers to self-managing computers. Autonomic computing aims to develop computing systems with the capability of managing themselves and able to operate under defined policies and rules without human intervention. The difference between CC and autonomic computing is that CC focuses on reducing the resource cost while autonomic computing focuses on reducing system complexity (Zhao et al., 2014). Autonomic systems are said to have four characteristics which are:

1. Self-protection - the ability of the system to identify potential risks and attacks proactively and avoid them.

2. Self-optimisation - the system can modify key operating parameters to improve the overall performance of the system.

3. Self-healing - the ability of the system to recover on its own from unpredicted failures of one or more of the system's components in a timely and automated manner; and

4. Self-configuration - the ability of the system to configure its own key parameters (Akbari, 2013:13).

Figure 2-2 is a conceptual model of an autonomic system comprised of sensors which allow the management system to gather information about the system. Then, based on defined objectives of the system and available information, an intelligent logic and reasoning unit is used to make decisions and generate results (Akbari, 2013).

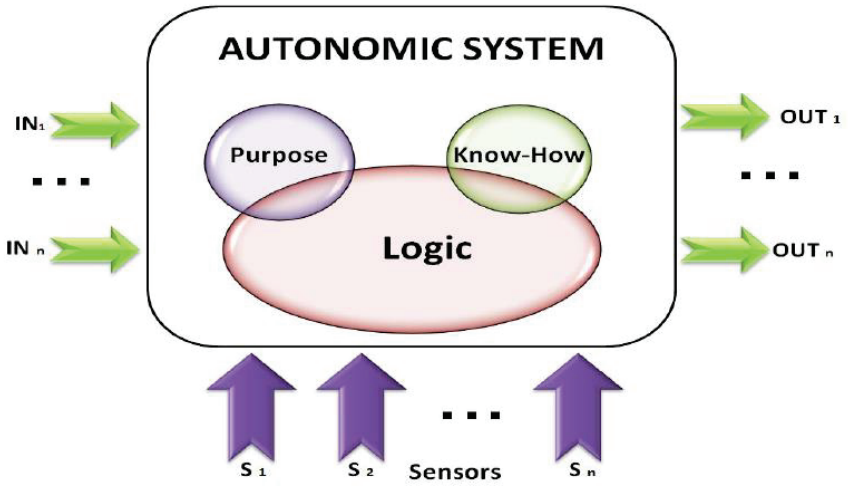

Figure 2-2: Autonomic Computing-A Conceptual Model (Source: Akbari, 2013:13)

2.3 Cloud Computing and SMMEs

The most common type of cloud service offering used by SMMEs is SaaS which assists them with product and service quality improvement along with business process improvement (Hussin et al., 2019). Some of the uses of CC in SMMEs include email correspondence, communications with staff, data analysis to measure the performance of their organisation, and to improve product innovation. IaaS is also common among SMMEs as they use it for data storage (Widyastuti & Irwansyah, 2017).

The majority of SMMEs use CC for sales and customer service. Some SMMEs use CC for their accounting and financial activities. For example, they make use of SaaS accounting and finance software. Their accounting and financial data are also stored on the cloud (Quinn & Cleary, 2014).

Some of the CC service used by South African SMMEs are email services, online backups, online accounting, online project management, and customer relationship management. About 83% of the South African SMMEs use it for email services, 47% use it for backups, 37% use it for accounting, 27% use it for project management and 25% use it for customer relationship management (Ventureburn, 2015). The usage of CC by SMMEs highlights the need for SMMEs to understand the benefits and limitations of CC and be more aware of all the issues associated with the implementation

of CC to guarantee a successful implementation. Other uses of CC by SMMEs are (1) desktop and payroll services, (2) enterprise resource planning, (3) messaging and collaboration using applications like Google Docs, Sites and Video (Ahmad & Siddiqui, 2014:10), (4) hosting services, (5) backup services and hosted emails, (6) data storage, (7) social media, (8) extension of computer resources such as random access memory (RAM) and central processing unit (CPU), (9) word processing, (10) virtual machines and infrastructure (Assante, et al., 2016:1211), (11) emails, (12) productivity, and (13) time management using a calendar (Mohlameane & Ruxwana, 2013:399).

2.4 Small, micro and medium enterprises and the management of cloud computing

Adopting CC places responsibilities on SMMEs to be able to manage all the complexities involved with CC in order to reduce the risks involved with the use of CC and maximise the benefits of CC. SMMEs need to be able to manage and negotiate CC pricing and negotiate SLAs (Adam & Musah, 2015). They need to manage the relationship with service providers and manage the contracts with the service providers (Attaran & Woods, 2018; Hentschel et al., 2019). Although the service provider offers security, SMMEs need to manage the security of their data from their side to avoid exposure of their data to an unwanted person. Furthermore, the need to ensure that they manage their employees about their utilisation of CC to avoid employee resistance (Yeboah-Boateng & Essandoh, 2014). They also need to manage the resources used to access CC.

Many SMMEs are opting for public cloud due to its low cost compared to private cloud. Hence, with regards to managing hardware, SMMEs are relieved of this burden, as the majority of the hardware, e.g. servers are managed by the service provider which gives SMMEs more resources and time to focus on their core business activities (Adam & Musah, 2015). Additionally, SMMEs need to monitor the cloud services they are using and manage their organisations' performance. Another important aspect of management for SMMEs in terms of CC is change management as CC leads to many changes in the way organisations do their businesses. SMMEs must manage the change effectively to avoid adverse effects that may arise due to changes brought about by CC (Hentschel et al., 2019). The effective management of all the issues can assist SMMEs in using CC effectively.

2.5 Theories

When exploring the adoption of technology, researchers can either investigate it on an individual, organisational or market level (Alismaili et al., 2015). To conduct these investigations, researchers use theories as a lens to guide analysis, explanation and prediction of observed phenomena (Levy & Ellis, 2006). Theories and models assist researchers by guiding them and directing them through the research process (Kiwanuka, 2015). Researchers also use theories for providing design and action guidelines (Lim et al., 2013). Using theories as a lens, researchers can make better sense of complicated problems and social issues. They can focus their attention on aspects of the data. Theories can also be used to design research questions, guide the selection and interpretation of relevant data, and propose explanations of causes or influences (Reeves et al., 2008).

This research aims to explore the factors affecting the management of CC in FSPs. A few theories have been identified and investigated for appropriateness in this research. The theories investigated for this study are Technology Acceptance Model (TAM) (Davis, 1980), Technology, Organisation and Environment (TOE) Model (Tonartzky & Fleisher, 1990), Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh & Zhang, 2010) and Diffusion of Innovation (DOI) theory (Rogers, 1962).

2.5.1 Technology Acceptance Model

TAM is one of the most widely used theories in literature in terms of technology acceptance (Davis, 1980; Kayali et al., 2016). It is based on the theory of reasoned action (TRA) and theory of planned behaviour (TPB) which researchers have widely used to understand the difference in user's behaviour in diverse environments (Almasri, 2015). TAM uses behavioural intentions of users to predict actual use reliably. A robust behavioural intention to use a technology is required to maximise the usage of a system (Mtebe, 2014).

TAM assumes that technology adoption is determined by the user's intention to use a technology. The attitude of the user's influences their behavioural intention to use a technology (Mtebe, 2014). There is a possibility that the varying attitude and behaviour of users towards the technology is determined by their perceived usefulness (PU) and perceived ease of use (PEOU). PU is the extent a technology promises to advance the user's work when used. PEOU, on the other hand, is the degree to which the technology requires little or no effort to use. TAM describes how the users of technology come to accept and use that technology. It suggests that several factors influence a user's decision about how and when to use technology every time they come across a new technology (Oye et al., 2012). Figure 2-3. depicts TAM version 1.

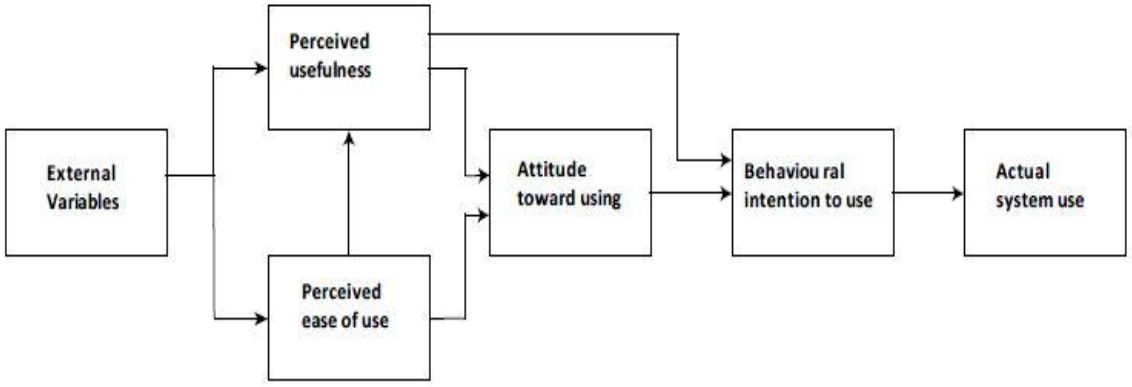

Figure 2-3: The Technology Acceptance Model-Version 1 (Source: Mtebe, 2014:8)

Research by Venkatesh and Davis (1996) found that the perceived ease of use and perceived usefulness have a positive influence on behavioural intention to use the technology. As a result, the construct "attitude toward using" was removed, and the second version of TAM was derived, as shown in Figure 2-4.

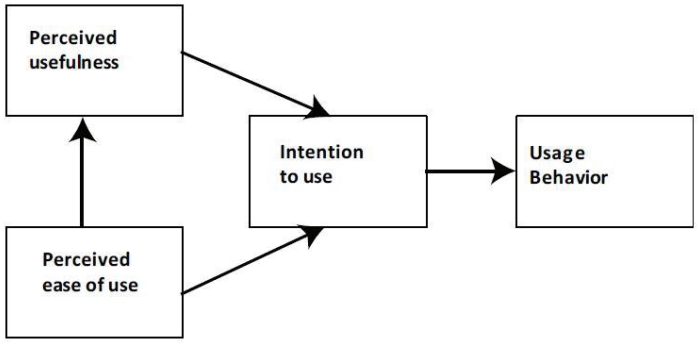

Figure 2-4: Modified Technology Acceptance (Source: Mtebe, 2014:9)

The modified TAM by Venkatesh and Davis (1996) demonstrated success and was used in several studies, but it has some limitations which make it unsuitable for some research. One of the limitations is that it cannot reveal the determinants of the perceived usefulness and perceived ease of use variables. Also, it focuses on technologies deployed in voluntary environments and pays little attention to compulsory use environments. These limitations prompted Venkatesh and Davis (2000) to extend the TAM model by adding variables to determine the perceived usefulness and perceived ease of use (Social Processes: subjective norm, voluntariness, and image; Cognitive Processes: experience, job relevance, output quality, and the results' demonstrability) to overcome these limitations. Furthermore, they tested the extended model in both voluntary and compulsory environments, and the model performed well in both settings (Mtebe, 2014). Figure 2-5 shows the extended TAM model by Venkatesh and Davis (2000).

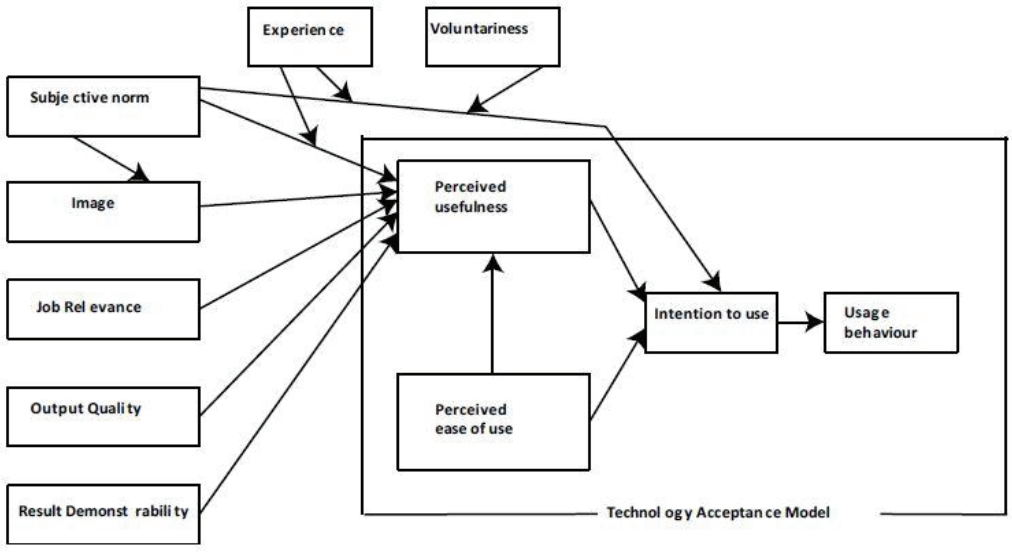

Figure 2-5: Technology Acceptance Model 2 (Source: Venkatesh & Davis, 2000:188)

A further extension of TAM 2 was made by Venkatesh and Bala (2008) who added determinants to perceived ease of use in addition to those identified in previous versions of the model. Thus, TAM 3

was developed to understand how managers make decisions regarding interventions that lead to acceptance (Venkatesh & Bala, 2008).

A limitation of TAM is that it is widely used by researchers to study technology innovation at individual levels (Alismaili et al., 2015) and it ignores the social influence on technology acceptance (Wong & Huang, 2011). Hence it is not suitable for studies focusing on the organisational level. Since this study focuses on the organisational level, TAM was found to be unsuitable for this study. Although TAM has been widely used by researchers to study the adoption and acceptance of technology, it has some limitations which have been noted by researchers. For example, it does not consider social influence as one of the factors that influence the acceptance or rejection of a technology (Kiwanuka, 2015).

2.5.2 Unified Theory of Acceptance and Use of Technology (UTAUT)

The UTAUT model addresses some of the drawbacks of TAM by using psychology-related and behaviour-related theories (Wong & Huang, 2011). The UTAUT model was developed by Venkatesh and Zhang (2010) by revising and integrating several technology acceptance models because of the need to develop a unified view of individuals' technology acceptance. They integrated eight theories to arrive at the UTAUT model. These are:

1. Theory of Reasoned Action (TRA),
2. Technology Acceptance Model (TAM),
3. The Motivational Model (MM),
4. Theory of Planned Behaviour (TPB),
5. Model of Personal Computer Utilization (MPCU),
6. Innovation Diffusion Theory (IDT),
7. Social Cognitive Theory (SCT),
8. a combination of Technology Acceptance Model and the Theory of Planned Behaviour (CTAM-TPB). (Alharbi, 2014; Mtebe, 2014; Kiwanuka, 2015).

Various studies have demonstrated that the UTAUT model describes the intention of users as well as their behaviour about 70% more than the eight models individually (Alharbi, 2014). It has been found to overcome some of the limitations of the eight models.

The UTAUT, like TRA and TAM, also uses the behavioural intentions of a user to predict and explain technology usage behaviour. It incorporates the perceived usefulness from TAM into performance expectancy. Similarly, perceived ease of use was incorporated into effort expectancy. Furthermore, the elements of the subjective norms were incorporated into the social influence construct. A new construct referred to as "facilitating conditions", was also introduced (Mtebe, 2014). Figure 2-6 depicts the UTAUT model.

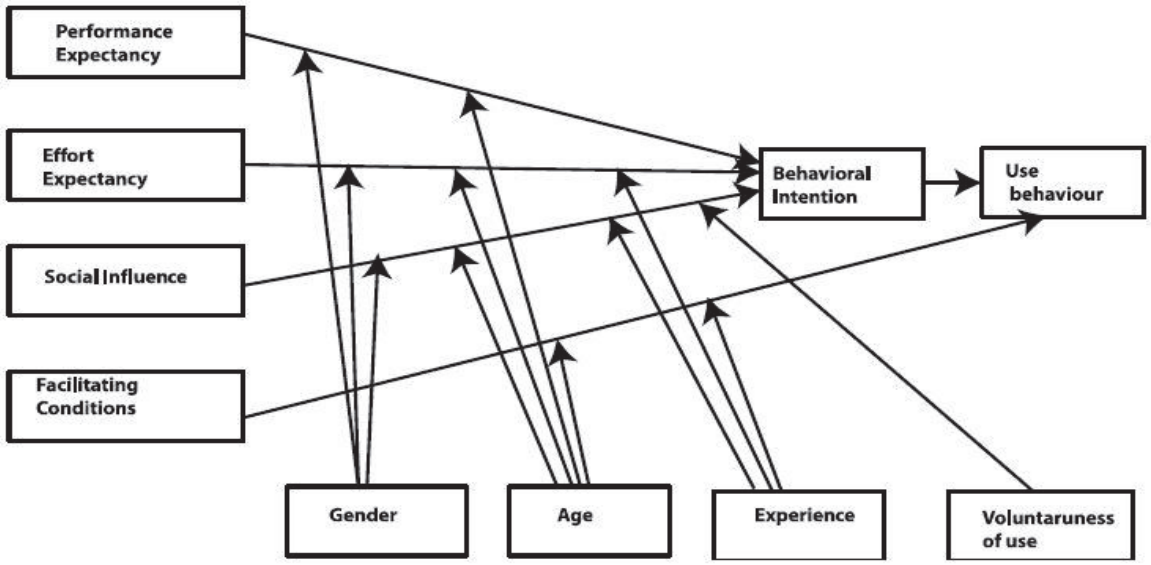

Figure 2-6: The UTAUT model (Source: Venkatesh & Zhang, 2010:8)

The five main constructs or determinants of the UTAUT model are:

1. Performance Expectancy (PE) - the degree to which a user believes that the use of a technology (e.g. CC) will assist him or her in attaining gains in job performance,

2. Effort Expectancy (EE) - the degree of ease that the user derives from using CC,

3. Social Influence (SI) - the degree to which a user observes that superior or important people around believe that he or she should use CC, and

4. Facilitating Conditions (FC) - the degree to which a user believes that the organisational and technological resources needed to use CC are available; and

5. Behavioural Intention (BI) is the degree to which an individual wants to use a technology (e.g. CC) repeatedly, and the degree to which the technology will be used in their work context. In this research (Wong & Huang, 2011:208 – 209).

These constructs play an important role as direct determinants of user acceptance and usage behaviour (Ntshakala & Eyono Obono, 2013).

As shown in Figure 2-6, gender influences three of the four constructs (performance expectancy, effort expectancy and social influence). Experience also influences three of the four constructs (effort expectancy, social influence and facilitating conditions). Age influences all the four constructs while voluntariness of use only influences one of the four constructs (social influence). Furthermore, three of the four constructs (performance expectancy, effort expectancy and social influences) have a

direct influence on behavioural intention while facilitating conditions have a direct influence on user behaviour.

Although UTAUT tries to overcome the limitations of the eight theories used in developing it, researchers have noted some of its limitations. These limitations include the fact that it lacks the aspect of trust as one of the constructs in theory. Also, it omits an important aspect of individuals' attitudes about technology and limits the mediating factors or user acceptance of technology to only four factors: age, gender, experience and voluntariness of use. Furthermore, UTAUT does not consider the stages before the adoption of technology as in Diffusion of Innovation Theory (Kiwanuka, 2015). The limitations of the studies that adopted the UTAUT model include: difficulty to generalise research results; difficulty in concluding from data analysis self-reported usage; focus on a single task at a specific time; and focus on only one community, organisation, department, person, age group, agency, culture or country (Dwivedi et al., 2011; Williams et al., 2015). Since this research focused on more than one organisation, the UTAUT model was not suitable for this research.

2.5.3 Diffusion of Innovation Theory

The diffusion of innovation theory addresses the motivation of users and their adoption behaviours (Chang, 2010). Diffusion is the process by which an innovation such as new ideas, application, product and technologies are delivered or communicated through a variety of channels over time among the members of a social system who are the potential adopters (Robertson, 1967; Akça & Özer, 2014; Kiwanuka, 2015). Diffusion of innovation is concerned with the modelling of how a new product enters the market (Przybyla et al., 2014). Diffusion is the process by which an innovation is passed among different members of a social system through a variety of channels over a period. The diffusion of technology is a complicated subject because several social processes are involved for a technology to become part of the daily life of individuals (Tola & Contini, 2015).

There are three main points emphasized by the diffusion of innovation literature.

1. Innovation is an idea, practice or an object that an individual perceives to be new.
2. It takes time for innovation to diffuse from one domain to other areas.
3. The adoption decisions regarding innovation can be optional, for example, individual adoption; collective (organisational) adoption; or authority adoption enforced by higher authorities such as management team (Dibra, 2015; Peng & Vlas, 2017).

The literature on diffusion of innovation shows that all innovations lose their novelties with time and people pay less attention to them (Peng & Vlas, 2017; Ritala et al., 2018; Loorbach et al., 2020). However, they become part of a knowledge base and form the foundation on which later innovations are built (Peng & Vlas, 2017).

Researchers have widely used DOI to study technological innovations at market levels. The limitation of this theory is that it focuses on technical perspective and does not consider the environmental perspectives in the adoption of new technology at an organisational level (Alismaili et al., 2015).

Five factors affect innovation, namely; innovative factors; individual factors; task factors; environmental factors, and; organisational factors (Akça & Özer, 2014:93-94). These factors can be broken down into multiple items based on perception referred to as traits and having a total of 28 attributes (Mustonen-Ollila & Lyytinen, 2003; Akça & Özer, 2014).

An invention can only be considered to be an innovation when consumers become aware of it and have a perception of it being new (Franceschinis et al., 2017). On the part of the users, the process of innovation decision starts when a user becomes aware that an innovation exists and gains knowledge of how the innovation functions. The Rogers model of innovation decision process is classified into five stages which are (1) knowledge stage (in which the user becomes aware of the innovation and how it functions), (2) persuasion stage (in which the user evaluate the characteristics of the innovation and form a favourable or unfavourable attitude about the innovation), (3) decision stage (in which the user decides whether to adopt or reject the innovation based on the outcomes of the evaluation), (4) implementation stage (in which the user purchases the innovation and makes use of it to assess whether it is useful or not) and (5) the confirmation stage (in which the consumer decides whether to continue using the innovation or stop using it). Figure 2-7 illustrates these stages.

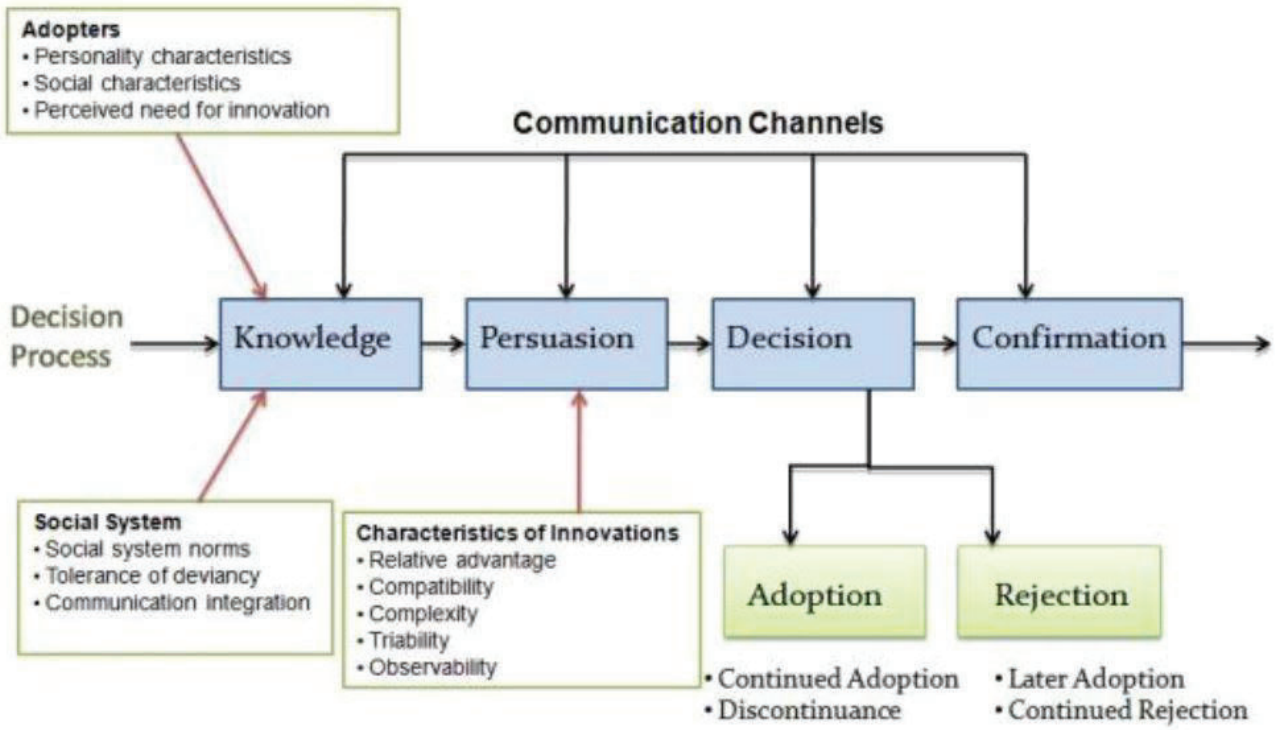

Figure 2-7: Four components in the diffusion of innovation adoption (Source: Chang, 2010:2)

There are four main diffusion dimensions proposed by Rogers' theory. These are:

1. **User perception of the innovation's characteristics** - For an innovation to be diffused, it must first be classified as an innovation (Dibra, 2015). This perception is further classified into four functional constructs which can be measured, being: complexity (the user's perception of how difficult or easy it is to use or understand the innovation); compatibility (the perception of users about the consistency of the innovation with existing practices or habits as well as routines); trialability (the possibility to use the innovation on a trial basis before purchase or adopting it); and relative advantage (the perception of the users about the superiority of the innovation to the current practice) (Dibra, 2015; Franceschinis et al., 2017).

2. **Available communication channels** - The second requirement for innovation diffusion is that the innovation must be communicated through various channels (Dibra, 2015). This communication is the process in which the users create and share information among themselves regarding the innovation. For diffusion to take place, it requires communication channels including an innovation, subjects (information source and information receiver) or other units of adoption, and a communication channel through which the message or information is passed across from the source to the receiver. Both the source of information and the channel of communication are important in ensuring the diffusion of innovation (Nilakanta & Scamell, 1990).

3. **Timing of adoption** - The third requirement for innovation diffusion is that the time factor or duration must be considered (Dibra, 2015). This depends on whether or not the adopter is innovative as it determines how early a particular user adopt an innovation compared to other members in his or her community.

4. **The social system** - The final requirement for innovation diffusion is that members of a community or social system must adopt it (Dibra, 2015). The social system is the system which the innovation affects (Chang, 2010). The risks in adoption and the norms of a social system determines whether innovators will be socially integrated or not (Robertson, 1967). One of the limitations of DOI is its lack of predictive power concerning the dissemination of an innovation (Chang, 2010). Another limitation of DOI is that places more emphasis on the innovation itself while paying less attention to the socio-cultural differences (Chile, 2017). The environmental and socio-cultural factors are important for this research because they play a vital role in the adoption and implementation of CC. For example, some societies have access to quality internet services and adequate infrastructure needed to access CC. Other societies have poor or no internet access with substandard infrastructure. This will create a difference in the success level of the adoption and implementation of CC in the two societies. Since socio-cultural factors are important for the adoption and implementation of CC, DOI was deemed unsuitable for this research.

Rogers classified potential adopters into five groups (Robertson, 1967; Franceschinis et al., 2017). These are:

1. **Innovators**: The innovators are the risk-takers and are always willing to try new ideas. They are always among the first people to adopt new technology and make up the 2.5th percentile of adopters (Robertson, 1967; Franceschinis et al., 2017).
2. **Early adopters**: The early adopters are mostly leaders in their community. Their leadership roles make other community members look up to them for advice regarding new innovations. Their attitude towards the new innovation is therefore very important as it will influence other members of the community. The make up the 13.5th percentile of adopters (Robertson, 1967; Franceschinis et al., 2017).
3. **Early majority**: The early majority are members of the community who are usually not in leadership roles like the early adopters but interacts well with other members of the community. Their interpersonal network makes them important in the process of diffusion of innovation. They make up the 34th percentile of adopters (Robertson, 1967; Franceschinis et al., 2017).
4. **Late majority**: The late majority are those members of the community who are undecided about the new innovation. They tend to doubt its outcomes and economic necessity. They may finally adopt the innovation due to peer pressure, or because they see that others that have adopted it are benefitting from its use. Just like the early majority, they make up the 34th percentile of adopters on the other side of the median (Robertson, 1967; Franceschinis et al., 2017).
5. **Laggards**: The laggards are the last group in terms of the timing of adoption, and are the most sceptical. They are conservative and have fewer resources. They also have limited access to information, unstable incomes and are often isolated from the social support system (Lien & Jiang, 2017). They make up the 16th percentile of adopters (Robertson, 1967; Franceschinis et al., 2017). Figure 2-8 is a schematic representation of the adoption curve.

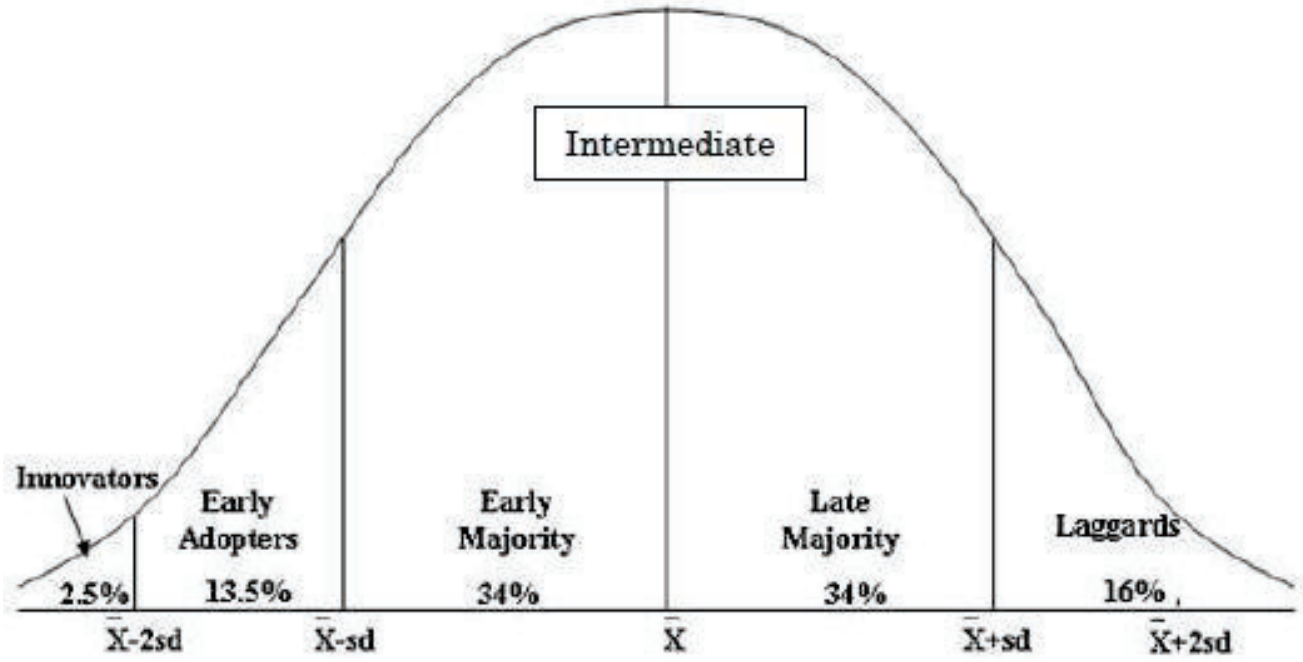

Figure 2-8: Adoption Curve (Source: Franceschinis et al., 2017: 27)

2.5.4 Technology, Organisation and Environment Framework

This research used the TOE framework, originally developed by Tonartzky and Fleisher (1990), as a theoretical lens to view the research problems in order to arrive at potential solutions to the research problems. The TOE postulates that the process by which an organisation adopts and implements a technology is influenced by the technological, organisational and environmental context in which the organisation is situated (Ntshakala & Eyono Obono, 2013). The technological contexts include all the technological innovations relevant to the organisation are available both within and outside the organisation. The organisational context refers to measures that describe or represent the organisation. For example, “the size, scope, managerial structure, resources, skills, centralisation, formalisation, and the quality of human resources” (Low et al., 2011:1010). The environmental context refers to the location in which the organisation carries out its business activities, for example, its industry, competitors, suppliers, customers and government (Ntshakala & Eyono Obono, 2013).

The TOE framework is a generic framework and has been used by researchers to study different types of innovation (Zhu & Kraemer, 2005). The TOE framework states that technology, organisation and the environment are the three aspects that affect the adoption, implementation and usage of technological innovations by any organisation (Hassan et al., 2017). The current technologies being used by an organisation and any other technology relevant to the organisations make up the technological aspect of the TOE framework. The scope, size, and the amount of slack resources available at the organisation internally and other descriptive measures about the organisation makes

up the organisational aspect of the TOE framework. The environmental aspects are the issues in the area in which the organisation carry out its business activities such as the industry, competitors, and association with government (Zhu & Kraemer, 2005). This research assumes that all these factors play a role in the successful adoption and implementation of CC by an organisation. As a result, the TOE theory is used as a lens for the investigation. Figure 2-9 shows some technological, organisational and environmental aspects examined by the TOE framework.

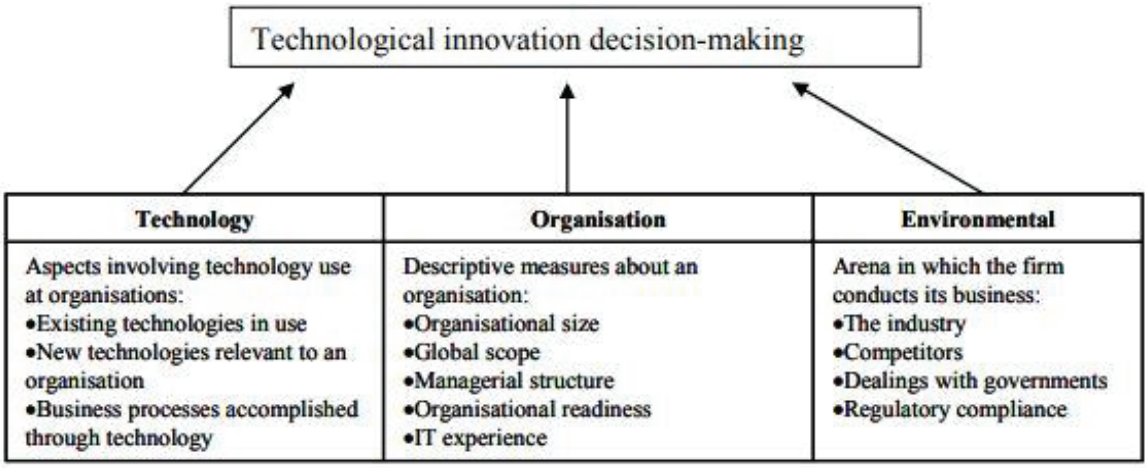

Figure 2-9: Aspects examined by the TOE contexts (Source: Marie & Lane, 2010:165)

TOE is the selected theory for this research because it provides a broader scope by covering the technological context, organisational context, and environmental context. Hence, it covers the scope of this research by providing organisational context and goes further by providing additional insights by providing technological and environmental contexts.

The consideration of environmental factors by TOE gives it an advantage over the DOI model. In relation to TAM, TOE is an institutional level theory. Unlike TAM, its focus is not restricted to technological only as it covers the organisational and environmental factors as well. Researchers have also criticised UTAUT because of its applicability only at the individual level (Tashkandi & Al-Jabri, 2015). Hence, this gives TOE an advantage over UTAUT as well because TOE can be applied at both individual and organisational levels.

Although TAM, UTAUT, DOI, and TOE have all be used by researchers to study the adoption of CC (Kayali et al., 2016), this research selected TOE because of its applicability at not just the individual level but also organisations level. It also does not only look at the technological aspects like the other theories as it looks at the organisational and environmental aspects as well. The TOE framework is more exhaustive and is better able to demonstrate intra-firm technology innovation because of its inclusion of the environmental context (Low et al., 2011).

In addition to that, the TOE model has been used by other researchers to study the adoption of CC and other technologies at the organisational level and the outcome has been successful (Low et al.,

2011; Alshamaila et al., 2013; Oliveira et al., 2014; Tashkandi & Al-Jabri, 2015; Senyo et al., 2016; Adam et al., 2019; Al Isma'ili et al., 2020; Shetty & Panda, 2020; Tambe, 2020). Furthermore, all the factors identified by various researchers in prior studies can be classified under technological, organisational or environmental context. Also, the majority of the previous studies have only explored the importance of the technological factors affecting CC while paying little or no attention to the organisational and environmental factors (Low et al., 2011). This study covers that gap by exploring all the three contexts (technological, organisational, and environmental contexts).

Thus, this researcher found the TOE framework to be suitable for this research.

2.6 Summary

FSPs are embracing CC in their quest to find cheaper alternatives to traditional ways of accessing computing resources. CC seems to be one of such alternatives, and it is becoming popular among FSPs. The ability of CC to provide FSPs with affordable access to infrastructure, development platform, service, and applications has been a major source of attraction of FSPs to CC. Some of the benefits of CC that attract FSPs include cost reduction, flexibility, scalability, accessibility, and its swift and easy deployment.

There are four different types of CC deployment models. These are private cloud, in which the resources are own and used exclusively by one organisation; public cloud, in which the resources are owned by a third-party service provider and shared among client organisations on a pay-as-you-go basis; hybrid cloud, which is a combination of both private and public clouds; and community cloud, in which the resources are shared among organisations with similar goals and objectives. CC also has several service models with SaaS, PaaS, and IaaS being the most common ones.

Although CC has many advantages that FSPs can enjoy, it also has some disadvantages which FSPs need to be aware of to ensure a successful implementation. Some of these disadvantages are the lack of awareness of FSPs about the benefits and limitations of CC and its reliance on the internet, lack of required skills to use CC, privacy and security issues, continuity issues, service migration issues, legislation and compliance issues and switching cost, performance and downtime issues, availability issues and cost of bandwidth. A good understanding of the advantages and disadvantages and how to avoid them can assist FSPs in successfully implementing CC.

Organisations in SA are classified into either small, medium, or micro-enterprises based on the number of employees they have, their annual turnover, and their gross movable assets. Any organisation that does not fall into the classification of SMMEs by the national small business act is regarded as a large organisation. FSPs play a vital role in economic growth and help in the creation of jobs.

To provide a better understanding of CC, its benefits and limitations, this research used the TOE framework as a theoretical lens to investigate and uncover the issues relating to CC use among FSPs.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

The underlying philosophies, research approach, research strategy, choice, and time horizon make up the methodology, which is a tool for conducting research. The research methodology that was employed in this research is highlighted in red, as shown in Figure 3-1.

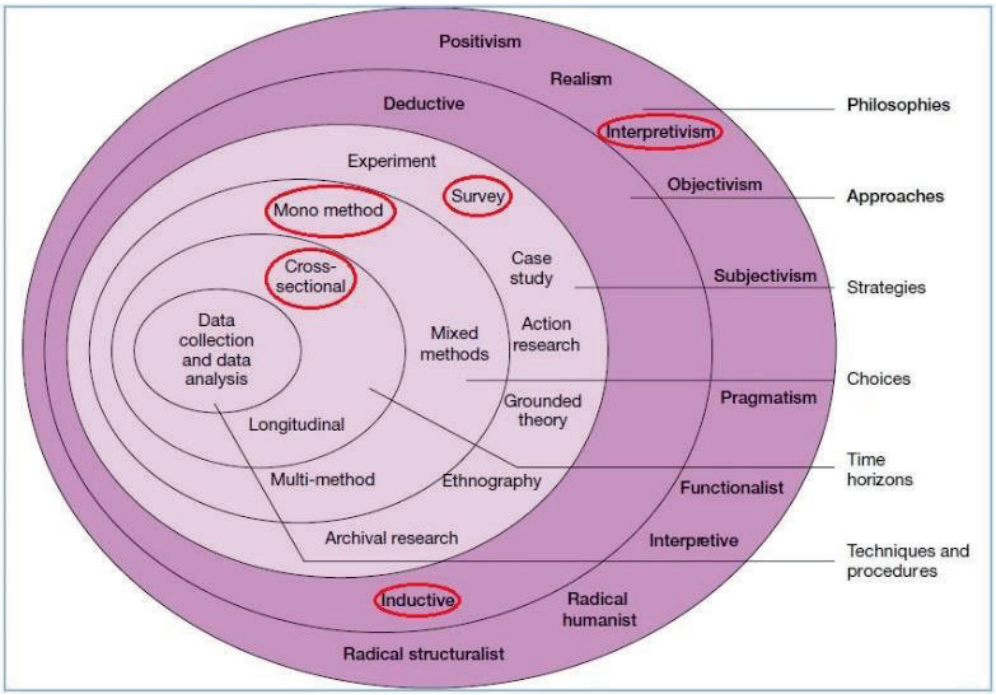

Figure 3-1: The Research 'Onion' (Source: Saunders et al., 2009:102)

The underlying philosophy assists in knowledge development within the research area, and it helps researchers to determine the appropriateness of the data collection method in answering the research questions (Saunders et al., 2009). This research is qualitative as a qualitative approach provided the researcher with a better understanding of the phenomenon being investigated. It also allowed the researcher to be able to describe the phenomenon based on the perception, attitudes, and interpretations of the participants (Bojuwoye et al., 2014). This research followed an interpretive stance because the researcher believes that reality is subjective, and the researcher's beliefs about the world can influence the result of research (Myers, 2009).

3.2 Research Philosophy

3.2.1 Ontology

Ontology is concerned with the nature of reality, and it questions the assumptions of a researcher about the way the world operates and their commitments towards particular views. It is concerned with how realistic the assumptions are that we make about reality (Bilau et al., 2018). It discusses

what a researcher intends to know or study about existing theories and the benefits derived by humans from the acquired knowledge (Suffa et al., 2019). There are two aspects of ontology commonly used by business and management researchers. These are objectivism and subjectivism (Saunders et al., 2009; Bilau et al., 2018).

3.2.1.1 *Objectivism*

This represents the position that, in reality, the existence of social entities is external to and independent from, social actors. This independence reduces the chances of bias on the part of the researcher (Saunders et al., 2009). Objectivism deals with the influence of social structures regardless of the perceived meaning people attach to it (Peter & Park, 2018). Objectivists believe that reality can be objectively measured (Kelly, 2018).

3.2.1.2 *Subjectivism*

Subjectivism believes that the perceptions and consequent actions of social actors lead to the creation of social phenomena, which are reviewed continuously through the process of social interactions. The involvement of a researcher with reality in subjective research may lead to bias on the part of the researcher (Saunders et al., 2009). Subjectivists hold the view that reality is subjective, and it is socially constructed. For example, an individuals' actions are created from the environment, culture, and process in which the individual exists (Kelly, 2018). The ontological stance for this research was subjectivism because the researcher was part of the research, which allowed her to view the world from her own perspective (Saunders et al., 2009).

3.2.2 **Epistemology**

Epistemology deals with what makes up adequate knowledge in a field of study. It explains how knowledge is created and how a researcher's bias affects that knowledge. It also provides a detailed understanding of the process involved in acquiring knowledge (Suffa et al., 2019). A researcher can embrace either an interpretive position or a positivist position to knowledge development.

3.2.2.1 *Interpretivism*

Interpretivism advocates the need for researchers to understand the differences between humans in their roles as social actors. It relies mainly on qualitative data, and it aims to understand human behaviour. Also, it assumes that there is no universal truth or reality, and that reality is what people think it is (Johnson et al., 2018). Interpretivism assumes that describing and understanding the meaning behind an action, i.e. the reasons that people do what they do is the main task of social research (Armstrong, 2018). The interpretivism approach emphasizes that reducing the complexity of this world to a series of law-like generalisations would result in the loss of rich insight into such complexity. Researchers taking this approach believes that reality is subjective and that what researchers believe about the world can influence the outcome of the research (Dean, 2018; Gemma, 2018). The interpretive position believes in the necessity of exploring the subjective

meanings motivating the actions of social actors to allow the researcher to understand these actions. The interpretivist views knowledge as being socially constructed with a complex nature and dependent on context (Bilau et al., 2018). An interpretivist researcher often adopts an empathetic stance by entering the social world of research participants and trying to understand the participants' world from their point of view (Saunders et al., 2009). Although researchers have widely used interpretivism, it is not without criticism. Some of these critiques are lack of concrete hypothesis before fieldwork; the sample size; lack of generalisability; and objectivity (Dean, 2018). This research adopted an interpretive stance as the researcher attempted to understand the differences between the FSPs stakeholders in their roles as social actors by interpreting the data collected in order to make claims about the truth and understand the participants from their own viewpoint.

3.2.2.2 *Positivism*

A researcher taking a positivist position often prefer working with a social reality that can be observed and such research leads to law-like generalisations similar to those produced by the physical and natural scientists (Saunders et al., 2009). A positivist researcher remains independent of the research and tests already established theories in different contexts (Munir et al., 2018). A positivist researcher values objectivity and consistently seeks to prove or disprove hypothesis (Gemma, 2018). The positivist researcher believes that reality is objective and that only observable phenomena can lead to the production of data that is reliable and credible. In generating a research strategy for data collection, researchers taking a positivist position often develop hypothesis using an existing theory. Also, in a positivist approach to research, the research is undertaken in a value-free way as far as possible, and the researcher is external to the process of data collection and does not influence the result of the data collection (Kelly, 2018).

3.2.2.3 *Axiology*

Axiology, also known as the study of value, is concerned with a researcher’s judgement based on value (Bell & Bellon, 2018). It is also known as the values theory because of its possibility to serve as a means of human orientation to answer fundamental questions (Suffa et al., 2019). During research, a researcher can express his or her personal value, beliefs, and experiences and he or she can be in a position to be unbiased regarding the value concept in the research (Bilau et al., 2018). The role that a researchers’ values plays in all the stages of research is important as it affects the credibility of the research. Hence, two researchers conducting similar research under the same conditions may arrive at different conclusions because of the differences in their judgement based on their values (Saunders et al., 2009).

3.3 **Research Approach**

A research project often involves the use of theory. The design of research may or may not make the theory explicit at the beginning of the research. The research approach involves the processes followed in carrying out research. The common approaches used are the inductive and deductive

approaches. The degree of clarity a researcher displays of the theory at the beginning of research raises an important question about the research design and shows whether the research approach is deductive or inductive (Bilau et al., 2018; Tian, 2018). When using a deductive approach, researchers collect empirical data and use it to verify the validity of the selected research theory. The inductive approach is different from the deductive approach in that a new theory is developed from the findings and observations made by researchers during focus group interviews or in-depth interviews with experts.

The TOE framework, existing literature, books and data collected was used to develop the new framework called “FSPCLOUD”. The FSPCLOUD framework aims to assist FSPs in their adoption, implementation and use of CC to ensure that they are able to enjoy the perceived benefits of CC.

3.3.1 Deduction

The deductive approach is also known as theory testing (Gehman et al., 2018; Fleischmann & Ivens, 2019) or theory-driven approach (McIver et al., 2018). It requires a researcher to understand an existing theory and then apply the theory to understand the phenomenon of interest (Mason et al., 2018). It tests the validity of existing assumptions, and it involves the development of a hypothesis and a research strategy to test the hypothesis (Tian, 2018). This approach closely associated with positivism. There are several essential characteristics of deduction, one of which is the search to explain the causal relationships between variables. Other characteristics of the deductive approach are the development of a hypothesis, data collection, and testing of a hypothesis. The deductive approach emphasizes that the researcher should be independent of the observed phenomena to ensure scientific rigour. Also, in a deductive approach, concepts need to be operationalised to allow the measurement of facts quantitatively. The last characteristic of deduction is generalisation. The deductive approach assists researchers to know which part of a theory or conceptualization does not provide a good explanation of the phenomenon of interest. It also allows a researcher to find other explanations supported by the empirical data (Bergdahl et al., 2019).

3.3.2 Induction

The inductive approach also referred to as building theory (Fleischmann & Ivens, 2019) or data-driven approach (McIver et al., 2018). The researcher begins by formulating research questions, study aims and having some pertinent assumptions that will guide his or her analysis. The researcher then proceeds with data collection, for example, conducting interviews with the participants to provide the researcher with a better understanding of the research problem.

Induction is used when there is limited or no previous theories or research findings (Armat et al., 2018). It contributes to the development of new theories (Tian, 2018). The analysis of the data collected and making sensible meaning of the data will then follow, and theory would then be developed based on the result of the data analysis (Bilau et al., 2018). This approach is closely associated with interpretivism.

This research followed an inductive approach, and a new framework (FSPCLOUD) was developed. This approach allowed the researcher to conduct the research with an open mind without having any predetermined ideas of what the outcome of the research would be, with the aim of developing a framework from the data. The researcher was able to examine existing theories in order to position the proposed framework (FSPCLOUD) within the discipline.

3.4 Research Strategy

The research strategy determines the way the data will be collected and analysed. Examples of research strategies are archival research, action research, ethnography, grounded theory, case study, experiment, and survey (Myers, 2009) (Figure 3-1). Research strategies can be linked with descriptive, exploratory or explanatory research, and they are all independent of each other. This research used a semi-structured questionnaire to obtain data from selected participants. Myers (2009) compared semi-structured questionnaires to night-vision goggles which allow a researcher to see the things that cannot be seen with the ordinary eyes and to observe what is looked at but rarely seen. The semi-structured questionnaire allowed the researcher to address all the research questions in an unbiased manner, for instance, participants were allowed to speak in their own language and not forced by the researcher to speak in her language. The researcher ensured this by listening, encouraging, recording, prompting, and directing the interview process (Myers, 2009).

3.4.1 Interviews

This research conducted interviews with participants from FSPs in the financial industry in SA to ensure that the data obtained is valid, reliable and relevant to the research question and objectives (Saunders et al., 2009). Twenty-two interviews were conducted with fourteen owners of FSPs and eight ICT managers in FSPs where the owners were not available for interview. The owners and ICT managers are involved with the implementation of ICT in their respective FSPs. The researcher obtained permission from the participants to record all the interviews. The recorded interviews were later transcribed to a textual format.

3.4.1.1 *Unit of Analysis*

A unit of analysis is an entity which the researcher intends to say something about at the end of a study. In some studies, the unit of analysis could be the same as the unit of observation. The unit of analysis is determined to a large extent by the research question (DeCarlo, 2018). In this study, the unit of analysis is the FSP as the research is aimed at saying something about FSPs and the issues they face when implementing CC.

3.4.1.2 *Unit of Observation*

A unit of observation is what a researcher observes, measures or collects data from while studying the unit of analysis. Unlike the unit of analysis, which is determined by the research question, the unit of analysis is determined by the method of data collection that a researcher uses to answer the

research question (DeCarlo, 2018). In this study, the unit of observation is the twenty-two participants described above (3.4.1). A short preliminary interview was conducted with the potential FSPs to ascertain whether they would be able to answer the questionnaire questions. It was necessary to ensure that all the participants had experience with CC and were able to provide relevant answers to all the questionnaire questions.

3.4.2 Data Collection

Research can either be qualitative or quantitative in nature. This research adopted the qualitative research method to provide answers to the research questions because qualitative research allows the researcher to understand the phenomenon under investigation in a natural setting. Researchers have used qualitative techniques for generating new theories, and it has had a significant impact in helping to shape the understanding of scholars about core theoretical constructs (Gehman et al., 2018). A qualitative research method enabled the researcher to uncover the benefits and limitations of CC in FSPs based on the views of participants from the selected FSP. This research selected the participating FSPs from the financial industry because the level of adoption of technologies and mode of operation of companies vary from one industry to another. The exploratory nature of this research allowed it to explore the benefits and limitations associated with the use of CC FSP and to identify how FSPs may take advantage of CC to expand their businesses and remain competitive (Wang, 2013). Data was collected through semi-structured questionnaires and was guided by an interview guide (Appendix D).

3.4.3 Sample design and design of the interview questions

This research collected data from either the owner or ICT manager in each of the participating FSPs. The participants were selected based on their CC knowledge and awareness. A short preliminary interview was conducted with the potential FSPs to determine whether they are aware of CC and would be able to answer the questionnaire questions. During the preliminary interviews, the researcher asked each potential participant whether they are aware of CC or not. The researcher then selected the participants that are aware of CC. After identifying suitable participants, the interviews were conducted with each of the participants. The duration of the interviews was between 45 minutes and 90 minutes.

The questionnaire questions were designed to be open-ended to allow the participants to answer the questions freely and eliminate any influence the researcher might have on the participants while providing answers to the questionnaire questions. This helped to reduce the possibility of bias on the part of both the researcher and the participants. The researcher was part of a team that conducted similar research on large organisations. Hence, the questionnaire questions from the prior research were used in conjunction with the selected research framework (TOE framework) to formulate the questionnaire questions. After the questionnaire questions were designed, a preliminary interview was conducted with owners or ICT managers of the potential FSPs. The outcome of the preliminary interviews was used to refine further and improve the questionnaire

questions. This process ensured that the final questionnaire questions were sufficient to obtain rich, valuable and relevant answers from the participants. Please refer to the interview guides (Appendix D) for the questionnaire questions.

3.4.3.1 *Data collection methods*

The researcher obtained all the necessary approvals, i.e. from the Faculty of Business Administration ethics in research committee at Cape Peninsula University of Technology (CPUT) (Appendix A2) and the management of the participating FSPs (Appendix H). A sample of the ethics clearance application form is available in Appendix A1. The researcher collected the necessary data through interviews with the owners or ICT managers of each of the participating FSPs. The data obtained from the interviews was then used in conjunction with the data obtained from literature to provide answers to the research questions. Table 3.1 is an outline of the data collection methods used in this research.

Table 3.1: Data Collection Methods

Data Collection Methods	**A brief discussion of the data collection method**
Semi-structured questionnaires	The researcher presented open-ended questions to the participants during the interviews. This allowed the participants to answer the questions freely without any fear. The participants were also not restricted to only the questions asked as they were allowed to mention any other issue that comes to their mind provided that they feel it is related to the issues being discussed. This allowed the researcher to obtain rich and valuable data from the participants. The data obtained from the interviews are presented in Chapter 4.
Literature review	The researcher conducted a review of the existing literature in the same or similar research area with this research. This allowed the researcher to understand what is already known about the phenomenon of interest and to identify what is unknown, i.e. the gaps in the literature. A full discussion of the literature review was presented in Chapter 2.

3.4.3.2 *Data capturing and editing*

The data was captured during the interviews using a recording device with prior permission from the participants. After each interview, the researcher listened to the recordings on several occasions and transcribed the recordings to a text format (Appendix F1 – F22). The transcribed interviews were then mailed to the participants to validate the correctness of the transcriptions. After validation, the data was exported to Atlas.ti (a qualitative analysis tool) which was used to analyse the data.

3.4.3.3 *Limitations faced during the data collection*

The researcher faced some limitations during the data collection phase of this research, one of which was getting participants with adequate knowledge of CC who would be able to provide answers to

3.5 Data Analysis

3.5.1 Analysis

A thematic analysis was done based on the Abductive Thematic Network Analysis (ATNA) (Rambaree, 2018:67) (Figure 3-2) using TOE as the theoretical lens. This research made use of Atlas.ti, a qualitative research tool for the analysis to improve the quality of the analysis. The six-step approach to accurately identify thematic patterns by Braun and Clarke (2006) was followed. The first step requires the researcher to study the data and get to know the data. To familiarise herself with the data, the researcher did the data transcription personally and during the process, tried to understand the data by reading through the transcripts several times. In step two, the researcher came up with codes relating to the relevant aspects of the data. During step three, the researcher generated themes, and in stage four, these themes were further reviewed, and new themes were identified, related themes were grouped, and irrelevant themes were eliminated. The themes were further refined in step five, and in step six, detailed analysis and interpretation of each theme were conducted. Based on the outcome of the data analysis and the TOE framework, the researcher developed the proposed framework, which can assist FSPs in their adoption and implementation of CC.

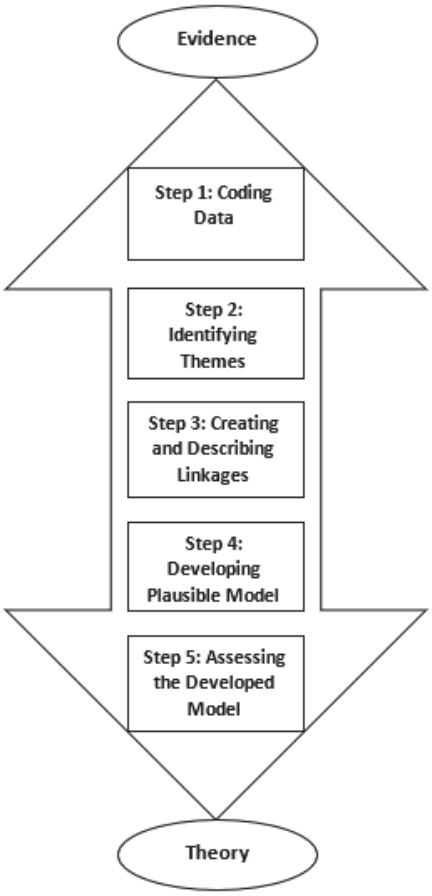

Figure 3-2: Abductive Thematic Network Analysis (ATNA) (Source: Rambaree, 2018:67)

3.5.2 Data reliability and validity

The reliability and validity of data help to ensure the integrity of data (Zikmund et al., 2012). In research, selecting appropriate data collection technique is vital to ensure the consistency and reliability of the data collected. The validity of research refers to the degree or extent to which the outcomes or findings of research reflects the true intentions of the participants (Bryman, 2012). The data analysis was sent back to the interview participants to get their feedback on whether the transcript reflects what they intended during the interviews, to ensure the validity of this research. The feedback from the interview participants was used to refine and improve the data analysis to reflect the true intentions of the interview participants. Validity aims to ensure that research findings meet the requirements of the research objectives. In the past, there have been questions raised among researchers concerning the validity of qualitative research. Contrary to the past believe regarding the validity of qualitative research, some researchers have demonstrated the validity of qualitative research (Saunders et al., 2009).

Bryman and Bell, (2011:42-43) classified validity into four types. These are measurement (1) validity, (2) internal validity, (3) external validity and (4) ecological validity. Measurement validity refers to how well the researcher measures the constructs. The internal validity refers to the degree of honesty with which the participant answers the questionnaire questions. For example, some participants may decide to provide a wrong answer or chose to withhold valuable information if they feel uncomfortable with a question. Hence, it could lead to bias on the part of the interview participant. The external validity refers to the possibility of applying the research findings to similar research and arriving at the same or similar outcomes. The extent to which a behaviour observed in one situation can be generalised to another situation is referred to as ecological validation (Bryman & Bell, 2011).

3.6 Ethics and confidentiality

The ethics and confidentiality issues of research need to be considered from the beginning of the research. Ethical factors such as informed consent, approval by the review board, feedback, confidentiality, inducement and how to handle sensitive results should be considered from the beginning of the research to avoid problems at a later stage during the research. This research obtained written consent from all participants, a sample of which is available in Appendix C. Permission was also obtained from the managements of all the participating FSPs to interview their staff (Appendix H). The questionnaire questions were submitted together with the ethics clearance application form to the Ethics Committee of CPUT for approval (Appendix A2). A cover letter which covers the ethics and confidentiality issues of this research was sent to the participants. The researcher explained all the issues as well as the risks of this research to the participants (Appendix B). The participants were introduced to the aim of this research; they were further informed that their participation is voluntary and their personal identity and the identity of their organisation, will not be included in the final research output to guarantee their confidentiality. Personal information about

the participants such as their names, position, email address and name of their organisation are excluded from the final research output to ensure that their anonymity is protected.

3.7 Summary of Research Methodology

This chapter provided a detailed discussion of the research method used in this research. The ontology, epistemology and axiology aspects of the research were discussed. This chapter also discussed the research design and described the approach, strategy, data collection methods and data analysis methods used in this research. The reliability and validity of the data collected were also discussed. This chapter provides a discussion of the ethics and confidentiality issues relating to this research.

The ontological stance for this research was subjectivism which considers that the perceptions and consequent actions of social actors lead to the creation of social phenomena that is reviewed continuously through the process of social interactions. Hence, the researcher was part of the research, and this allowed her to view the world from her own perspective (Saunders et al., 2009). This research followed an interpretive paradigm which enabled the researcher to take an empathetic stance by entering the social world of research participants and trying to understand the participants' world for their point of view. The interpretive stance also allowed the researcher to understand the differences between the FSP stakeholders in their roles as social actors by interpreting the data collected to make claims about the truth and understand the participants from their viewpoint.

This research followed an inductive approach and based on the findings, a new framework (FSPCLOUD) for FSPs in their use of CC was proposed (Chapter 5). The research adopted the qualitative method, and data was collected through interviews. The data collected was analysed using thematic analysis.

CHAPTER 4

DATA ANALYSIS AND FINDINGS

4.1 5Introduction

This chapter presents an analysis of the data collected from the interviews and the subsequent findings.

The research used 22 FSPs as data sources, selected from Cape Town, Western Cape, SA. The interviews were scheduled for 45 minutes, but some ran over that time. Table 4.1 shows the profile of the FSPs and the interviewees.

The data has been analysed based on the intention of finding solutions to the research problem. The research problem leads to two research questions (RQ 1 & RQ 2), subdivided into three sub-questions for RQ 1 (RSQ 1.1, RSQ 1.2 & RSQ 1.3), and two sub-questions for RQ 2 (RSQ 2.1 & RSQ 2.2), as shown in Table 1.1. The questionnaire questions were derived from the RQs, and the responses to these questions were transcribed. The transcriptions were analysed using thematic analysis to elicit categories and themes emerging from the transcripts (Table 4.8). The key concepts (20), categories (8) and themes (4) were based on the initial concepts (93) and findings (63) derived from the interviews.

4.2 Mode of Analysis

The thematic analysis method of Braun and Clarke (2006) was chosen as the appropriate analytic method for this study, because of its proven ability to identify, analyse and report themes in data.

4.3 Profile of FSPs and Participants

The participants were mainly the owners of the selected FSPs. However, eight of the twenty-two participants were not the owners, but they are the ICT managers in charge of the ICT operations of their respective FSPs. The ICT managers were selected in the eight FSPs because the owners were not available for the interviews. All the participants are involved in the ICT decision-making process of their organisation. As with the FSPs, the participants' names have been coded as P1, P2, … P22 (Table 4.1) to maintain their anonymity. Fourteen of the participants are owners of their FSPs, while eight of the participants are ICT managers. The participants' experience using CC ranges from one year to ten years, and they all use at least one form of CC with the most common one being SaaS. For example, all the participants noted that their email is SaaS-based.

Table 4.1: Profile of the participants in the study

Company	Years in business	Number of employees	ICT dept
FSP 1	5	10	No
FSP 2	8	24	No
FSP 3	3	15	No
FSP 4	3	32	Yes
FSP 5	8	23	Yes
FSP 6	5	19	No
FSP 7	13	45	Yes
FSP 8	8	17	No
FSP 9	2	14	No
FSP 10	2	38	Yes
FSP 11	8	37	Yes
FSP 12	7	18	No
FSP 13	2	16	No
FSP 14	9	27	No
FSP 15	8	22	No
FSP 16	1	11	No
FSP 17	2	39	Yes
FSP 18	7	48	Yes
FSP 19	3	15	No
FSP 20	6	42	Yes
FSP 21	7	30	No
FSP 22	12	14	No

Participant	Position	Years of CC experience
P1	Owner	**4**
P2	Owner	**8**
P3	ICT Manager	**9**
P4	Owner	**3**
P5	Owner	**1**
P6	Owner	**5**
P7	Owner	**10**
P8	ICT Manager	**2**
P9	Owner	**3**
P10	ICT Manager	**7**
P11	Owner	**5**
P12	Owner	**8**
P13	ICT Manager	**3**
P14	Owner	**1**
P15	Owner	**4**
P16	ICT Manager	**9**
P17	ICT Manager	**8**
P18	Owner	**3**
P19	Owner	**2**
P20	ICT Manager	**6**
P21	Owner	**4**
P22	ICT Manager	**6**

4.4 The Data Analysis

The process followed for the data analysis was as follows:

1. Interviews were transcribed and the transcriptions validated by the participants.
2. Initial codes and words were then identified.

3. From the initial codes and words, 93 initial concepts were derived.
4. These concepts were analysed and 63 findings emerged
5. From these findings, 20 key concepts were developed.
6. Eight categories were derived from the key concepts.
7. From the category's, four themes were developed.

Throughout, the research questions and sub-questions were linked to each stage (Table 4.8).

The first step of the analysis was to read and understand the data (Stuckey, 2015). The transcripts were subsequently loaded into Atlas.ti, which assisted the linking of concepts with the corresponding quotations. Figure 4-1 presents a partial list of the transcribed documents on Atlas.ti.

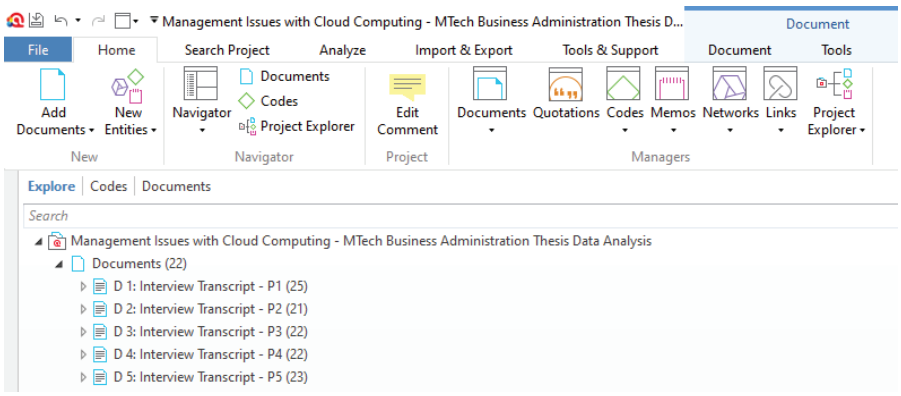

Figure 4-1: Partial list of transcribed documents on Atlas.ti

The second stage involved the creation of the initial codes derived from the transcriptions (Stuckey, 2015). To enhance the coding of Atlas.Ti, the programme MonkeyLearn was used to identified words of significance. The outcome of Atlas Ti and MonkeyLearn were combined, and 93 initial concepts are identified (Table 4.2). The identification of these initial concepts was made by combining similar concepts (Williams & Moser, 2019). For example, CC security was merged with inhibitors of CC. Similarly, CC skills was merged with organizational factors of CC. The researcher used open coding during the first stage of analysis. The open coding allowed the researcher to be able to consider small segments of data in detail and to compare the different data segments with one another (Lewis, 2015).

Table 4.2: Initial concepts derived from the transcripts

INITIAL CONCEPTS		
Confidence in cloud computing adoption	Service level agreement	Time-saving
Cloud computing strategy	Possible loss of income due to disruptions of internet services	Accessibility

Basic computer skills	Cloud computing as a tool for invoicing and expense tracking	Difficulty of data migration
Soft skills	Cloud computing usage for core business activities	Possibility of data lock-in
Communication skills	Cloud computing supporting tools	Concerns over data location
Lack of technical skills	Cloud computing service offering used	Malicious insider
Computer skills	IaaS applications used	Disadvantages of cloud computing
Knowledge of cloud computing	SaaS applications used by the participating FSPs	Concerns over security and privacy of data
Cloud computing as a training and development tool	Cloud computing service provider	The high cost of servers
Educational background	Cloud computing service provider	Limited knowledge of cloud computing
ICT degree	Access to more customers	Identity theft
Environmental factors of cloud computing	Benefits of cloud computing	Accessibility of cloud computing
Long service	Cloud computing as a banking tool	Inhibitors of Cloud Computing adoption
Own device	Cloud computing as a cheaper solution	Reliance on the service provider for data security
Cloud computing service provider	Cloud computing as a tool for invoicing and expense tracking	Reliability of internet service
Organisational factors of Cloud Computing	Cloud computing as a tool for reporting	Possibility of data access by an unwanted person
Top management support for Cloud Computing	Cloud computing as an advertisement tool	Possibility of outage
Competition between service providers	Elimination of license fees	Broadband issues
Cloud computing billing as a utility similar to water and electricity	Enablers of cloud computing adoption	Pay per use
ICT Resources	Faster time to market	Cost and quality of internet access

Cloud computing strategy	Increased uptime	Cloud computing as a storage tool
The high cost of ICT resources	Integration of data	Cloud computing as a communication tool
Affordability of small businesses	Lack of data access	Installations, maintenance and upgrades
Business continuity and disaster recovery	Main business activities	Identifying a suitable service provider
Business value of cloud computing	No need for ICT experts	Data control
Cloud computing legal issues	On-demand access	Cloud computing security
Cloud computing as a training and development tool	Possibility of data access by an unwanted person	Scalability of cloud computing
Cloud computing as a customer relationship management tool	Reduced ICT support	Service level agreement
Customer complaints and feedback	Scalability of cloud computing	Technological factors of Cloud Computing
Cloud computing as a payroll tool	Sensitivity of customer information	Integration with legacy systems
Main business activities	Speed of service provider response time	Service level agreements

The 93 initial concepts were analysed (Table 4.2) and 63 findings derived. From the 63 findings, 20 key concepts were developed, as shown in Table 4.3.

Table 4.3: The twenty key concepts identified

Key Concepts
Confidence in cloud computing adoption
Benefits of cloud computing adoption
Cloud computing service provider
Environmental factors of cloud computing
Cloud computing service offering used
Cloud computing supporting tools

Challenges of Cloud Computing adoption
Level of Cloud Computing adoption readiness
Business continuity and disaster recovery
Business value of cloud computing
Cloud computing legal issues
Service level agreement
Top management support for Cloud Computing
Cloud computing strategy
SaaS applications used by the participating FSPs
Cloud computing security
Organisational factors of Cloud Computing
Technological factors of Cloud Computing
Cloud computing skills
Understanding of Cloud Computing concepts

Using the same approach, eight categories of output were derived from the 20 key concepts (Table 4.4). These categories were then linked to the research sub-questions. The categories are (1) CC adoption readiness, (2) education level, (3) skills, (4) environmental factors of CC, (5) organisational factors of CC, (6) benefits of CC adoption, (7) inhibitors of CC adoption, (8) technological factors of CC and (9) applications used by FSPs.

Table 4.4: The eight categories derived from the 20 key concepts

Categories
Cloud Computing adoption readiness
Education level
Skills
Environmental factors of Cloud Computing
Organisational factors of Cloud Computing
Benefits of Cloud Computing adoption
Inhibitors of Cloud Computing adoption
Technological factors of Cloud Computing

Applications used by FSPs

From the eight categories, four themes emerged, i.e. (1) Readiness management, (2) Management of environment, (3) Management of adoption, and (4) Management of technology and Management of applications. Table 4.5 shows the four themes.

Table 4.5: The four themes developed from the categories

Themes
Readiness management
Management of environment
Management of adoption
Management of technology

Table 4.8 represents the process followed from the initial codes, the findings, the key concepts, categories, themes and the linking of research questions.

4.5 The results

From the initial concepts 22, key concepts were identified. These key concepts are linked to the research questions and research sub-questions. In the following sections, the responses of the participants in terms of the sub research questions are discussed and then findings produced. The following is a narrative on the definitions of CC by the participants. The section ends with the development of the categories, themes and a summary.

4.5.1 Definition of Cloud Computing by the participants

Although the participants are pre-selected as FSPs that use CC, it is deemed necessary to determine how the participants define CC. The participants are all able to explain or define CC in their own words, showing that they have all heard about CC and are capable of answering the interview questions. A complete list of all the definitions of CC from the twenty-two participants can be found in Appendices F1 to F22. Four of the definitions (two from the owners and two from ICT managers) are:

> "Cloud computing is a concept whereby ICT resources like software and hardware are provided to users by an external company on a pay-per-use basis. It is a cheaper way to access the resources that are often too expensive for small businesses like ours to afford. I think it's a good thing for small businesses like us." (P1; Appendix F1).

"Cloud Computing is the availability of computer resources to users over the internet. The users can access the resources on-demand and pay per-use. This means that they are kind of renting the resources from the third-party service provider." (P4; Appendix F4).

"Cloud Computing is a concept of offering ICT resources over the internet. The users are able to access the resources such as hardware, software, applications and development platforms over the internet and pay based on their usage." (P19; Appendix F19).

"Cloud Computing is the on-demand supply of computer resources by a service provider with no direct management of the resources by the user. The service provider takes care of all the management of the resources." (P21; Appendix F21).

From the twenty-two definitions of CC provided by the participants, four main findings have been identified.

Finding 1: Cost reduction is the main reason why FSPs are adopting CC.

Finding 2: The dependence of CC on the internet is a major problem faced by FSP's

Finding 3: FSPs are attracted to CC because of its pay-per-use ability.

Finding 4: The possibility to work from any place at any time is one of the reasons behind FSPs adoption of CC.

4.5.2 Findings from the initial concepts

An organisation's level of readiness to adopt a technology plays a significant role in determining the success of that adoption. This research explored factors such as skills level, availability of business continuity and disaster recovery plans, availability of business strategy, CC supporting technologies and service level agreement to evaluate the level of readiness of the participating FSPs. FSPs must assess their level of readiness and ensure they attain the necessary level before adopting CC, thus increasing their chances of successfully adopting CC.

An FSP with a high readiness level has a better chance of adopting CC successfully and maximising its benefits. On the other hand, an organisation with a low level of readiness may struggle to adopt CC successfully, which may subsequently lead to implementation failure. P4 indicates that: "The first issue is the level of readiness of the company. If the staff are not technologically inclined, it could lead to resistance which could, in turn, lead to failure of cloud computing" (P4; Appendix F4). P4, P8 and P9 mention the importance of readiness assessment before the adoption of CC. "Before implementing cloud computing, it is important to do some readiness evaluation to determine whether the organisation is ready or not. This will help to avoid implementation failure due to lack of readiness" (P4; Appendix F4).

P8 states that "lack of readiness for the technology can affect organisations ability to adopt the technology effectively." (Appendix F8). To minimise the possible management issues that may arise because of a lack of readiness, P9 suggested that FSPs should work on improving their readiness

level before adopting CC (Appendix F9). “Improved readiness level before adoption will help to minimise these issues” (P9; Appendix F9).

Lack of training and development programmes in 17 of the FSPs shows a lack of readiness for CC before adoption. This is related to findings 15, 45 and 46, respectively. Only five of the participants (P2, P3, P6, P11 & P22) mention that they have training and development programmes for their employees on CC (Appendixes F2, F3, F6, F11 & F22).

Since a lack of readiness can affect the success of CC implementation, FSPs need to consider assessing their CC readiness before implementation. Other FSPs that have not yet implemented CC can also learn from the mistakes of the participating FSPs by conducting readiness assessments before adopting CC.

This research found that the lack of awareness about the benefits and limitations of CC is widespread among FSPs. The participants note that only a few of the employees in their respective organisations are aware of CC and that the majority of the employees require training to create awareness of CC and equip them with skills needed to use CC for their daily business activities.

This research suggests that FSPs should work on increasing the awareness of CC among their employees as the low usage of CC among the participating FSPs could be due to the lack of awareness of CC among their employees. P19 suggests the FSPs should try to create awareness among their staff as it could boost their interest in using CC. The low usage of CC, together with the lack of awareness of the benefits and limitations of CC, shows a lack of CC readiness from the FSPs. P8 suggests that FSPs should provide training for their employees to assist them in improving their skills level and ultimately increasing their level of readiness for CC adoption. “Training and development should be offered to staff members as this can increase their readiness level and make them more aware of cloud computing and how to use it effectively” (P8; Appendix F8)

Finding 5: Awareness of CC is low among employees of FSPs.

Finding 6: The lack of awareness of CC causes low usage among employees of FSPs.

The environmental factors are external to the organisation. The CC service provider falls under this category as they are third-party organisations to the FSPs. Likewise, the government falls under environmental factors because government support or lack of it is external to the FSPs. The participants note the importance of getting a service provider that is credible because they may rely solely on the service provider for the safekeeping of their data. They also rely on the service provider for continuous on-demand access to their data and to provide them with business continuity and disaster recovery since most of them do not have any plan in-house for business continuity and disaster recovery. Hence, the participants suggest what to do to identify a credible service provider before finally adopting their services. P1 said that comparing three to five service providers and their offerings and then choosing the one that best suits the company’s needs is the way to go. Some of

the factors to consider when selecting a service provider includes the suitability of their offering for the company's activities, the cost, ease of use and functionality of their offering. P1 proposes that:

> "What I normally do is to decide on which service is suitable for our needs and then do some research on which companies offer those services. I would normally choose 3 to 5 companies and then do more research about them to later decide on one based on my findings." (Appendix F1).

He also suggests that confirming from existing clients of the service provider whether the service provider keeps to the SLA and responds to customer issues timeously as it bolsters the service providers' credibility. P2, P4, P5, P7, P9, P14, P15, P17, P18, P20 and P22 suggest getting testimonials from existing customers of the service providers and looking into how long the service provider has been in business. For example, P2 said:

> "If they can deliver on their promises, then I think they are trustworthy. Before one can choose the service provider, I think one can find out from their existing customers about their service and based on what their customers have to say, and one can decide whether to use their services or not." (Appendix F2).

P2 and P4 contribute by saying that: "The number of years they have been in business is something to look at because if they have been operating for long, chances are they are doing something right. Customer complaints and feedback on social platforms can also give an indication of a service providers trustworthiness." (P2; Appendix F2).

> "looking at the number of years they have been in business is one thing. Another thing is to get references from their existing customers. One can also do some online research about them like looking at websites that deal with customer complaints such as HelloPeter.com to see customers comments about them." (P4; Appendix F4).

P20 adds that:

> "I think the size of the service providers business and the number of years they have been in the market is a good indicator. If they are big and have been in the market for a long time, that could mean that they are doing something right. Otherwise, they should not have a big customer base if they were not keeping the customers happy." (Appendix F20).

P3, P5, P10, P11, P13, P19 and P21, tested the applications by using the trial versions before adoption. "We first look at vendors that have trial versions of their services and use the trial versions. We then compare which of the vendors best suit our needs based on our experience using the trial versions." (Appendix F3). P10 states that "I think the best way is to try their service first before signing up for their service." (Appendix F10). It is suggested by P3, P4, P7 and P9 that consideration of the

uptime guaranteed by the service providers is essential in identifying a credible service provider. P3 states that: “A trustworthy service provider should be able to guarantee at least 99.9 per cent uptime and keep to the service level agreements.” (Appendix F3). P8 also suggests testing the service providers applications for compatibility with existing in-house applications before finally adopting it. “Testing their applications first for compatibility with our needs is one way to verify the credibility of a service provider.” (P8; Appendix F8).

P11 introduces the principle of a trial version and states that:

> “The best thing is to test their services before adopting it. Maybe use a trial version, and if you’re happy, you can then adopt it.” (Appendix F11). P13 also mentioned that “what we did with some of the Cloud Computing applications that we currently use was to first use the trial versions before final adoption.” (Appendix F13).

P19 argues that: “It will be nice to have a demo of their services first to see if it is exactly what we are looking for. Most of the service providers have trial versions nowadays, so it is best to first use a trial version of the application to see its compatibility with our business before final adoption.” (Appendix F19). P21 also mentions that trial versions are a good option and said, “first using the trial version before adoption is a good option as it will allow someone to determine if the application has all the features and functionalities needed.” (Appendix F21).

There are some other characteristics FSPs consider when selecting a service provider. For example, “the speed at which the service provider responds to issues could be an indication that they are trustworthy.” (P5; Appendix F5). P5 mentions trustworthiness of the service provider who can solve issues immediately. A reputable service provider should have a good reputation in the market so, so investigating their reputation is an appropriate way to start. “A service provider is trustworthy if they can ensure the security and privacy of your data. A trustworthy service provider should also ensure that the service level agreement is always reached.” According to P6 (Appendix F6). Another indication of a credible service provider is when a service provider honours the SLA and always ensures the security and privacy of data stored with them. The management of SLAs is important, and P4 expands by stating that: “I think if the service provider has at least 99 per cent uptime and they stick to all the agreement in the service level agreement. They also need to carry out the agreed remedy in case they fail to deliver as promised.” (Appendix F4). Of all the participating FSPs, only one does not have a written SLA with their service provider. The other twenty-one FSPs noted that they have a written SLA in place which clearly states what is expected of them and the service providers as well as the remedies in case there is a breach from either party.

P12, P15 and P16 suggest that FSPs should carefully identify the requirements and find out which service providers offer applications that meet those requirements. They should then carefully map their requirements to the different applications. In other words, the FSPs should look at their

requirements and look at the available cloud offerings that can satisfy those requirements. They should then investigate the different CC vendors and what they offer and decide based on the outcome of their investigations with the different service providers that they have selected. Finally, they should select the applications that best meet their requirements.

Finding 7: There is a need for credible service providers FSPs as it is essential to ensure the safety of their data and to guarantee business continuity and disaster recovery.

With regards to legal issues, participants are not aware of any laws or regulations specific to CC, showing a lack of readiness for CC from the participating FSPs. They are also worried about the legal issues that may arise in cases where the service provider stores their data in locations with different laws from where their businesses are situated. “I am also concerned about the location of the data as this may raise some legal or jurisdiction issues.” (P1; Appendix F1). P4 mentions that “I think legal issues can also arise when data is stored in locations with different laws from that of the organisation that owns the data.” (P4; Appendix F4). Thus, it is important to ensure that a service provider is reliable before opting for their service. P3 suggests that it is of utmost importance to select a credible service provider to ensure that they can guarantee business continuity in case of a disaster.

Finding 8: A service level agreement (SLA) is an essential document that FSPs need to have when adopting CC as it protects them in case there is a breach by the SP.

Finding 9: The participating FSPs understand the importance of SLA, and most of them have SLAs in place.

With regards to laws or legislations relating to CC or data protection in SA, only one of the participants (P4) is aware of the Protection of Personal Information (POPI) Act which came into effect in 2013 (South African Government, 2013). He noted that apart from the POPI act, he is not aware of any other law or legislation in SA that relates to CC. P4 said:

> “I know of the protection of personal information (POPI) act which is meant to ensure that companies do all they can to protect people’s personal information. Apart from that, I do not know any other law or legislation. I think legal issues can also arise when data is stored in locations with different laws from that of the organisation that owns the data.” (Appendix F4).

Although the service providers guarantee the protection of data stored with them in their SLAs, the majority of the FSPs do not have full confidence in the service providers as they still have doubts about the security and privacy of their data. Of all the participants, only P2 and P14 have full confidence in their service provider with regards to the security of their data. Some others are confident, but they still have some doubts regarding the service providers ability to protect the security and privacy of their data. It is interesting to see that although the majority of FSPs do not

have full confidence in the protection of their data by the service provider, that has not served as a deterrent factor for them to adopt CC. "I think I have about 70 per cent confidence as there is a possibility of an unwanted person gaining access to our data either from our side or from the service providers side" (P3; Appendix F3). P4 is also not confident about safety issues and said "I am not so confident about the safety of our data since it's stored with the service provider. Anything can happen from their side. For example, there could be a case of a malicious insider in which one of their employees can expose our data to an unwanted person." (P4; Appendix F4).

Finding 10: FSPs have little confidence in CC because of security and privacy issues.

Finding 11: Many FSPs do not have security measures in place for CC and rely solely on the security measures provided by the SP's.

The organisational factors are internal to the organisation. They include top management support, employee's willingness to use CC, available resources, skills, firm size and the availability of training programmes. P1 confirms this by saying that: "as the owner of the business, I am very supportive of our CC initiatives because I know it can improve our services to our customers and bring us a lot of benefits." (Appendix F1). P2 echoes this by saying: "I am very supportive of our CC initiatives because it is adding a lot of value to our business. For example, we are able to reach more customers and maintain a good relationship with all of them using a CC service called AdvanceForce." (Appendix F2).

The lack of needed CC skills affects the employee's willingness to use CC. Some employees are reluctant to use CC because of the fear that it is not easy to use. P6 confirmed this by stating that: "The lack of technical skills by my workers is also a problem." (Appendix F6). The lack of training programmes to equip employees with the needed CC skills also influences the adoption of CC.

The availability of technological resources such as computers and internet also affect FSPs chances of successfully implementing CC. The size of the firm also influences CC adoption. Small firms are unable to employ dedicated ICT staff to cater to their CC needs, whereas bigger firms can.

The adoption of CC by FSPs for core business activities is expected to increase in future as more FSPs continue to provide training for their employees to equip them with the needed CC skills. Twelve of the twenty-two participants note that they are busy researching how they can use cloud applications for their core business activities. They are also looking into the available cloud offerings and the risks involved with each offering. FSPs are faced with the need to find ways to improve their business processes. Hence, they are attracted to CC, and they continue to explore how CC can help to improve their business processes. This could create more awareness of CC among FSPs and consequently increase FSPs confidence in using CC.

Finding 12: The adoption of CC for core business activities among FSPs is expected to increase in future as FSPs continue to explore CC.

Finding 13: The support from top management is essential for successful adoption and implementation of CC.

This research found that there is no strategic planning in place at the participating FSPs. Hence, FSPs solely rely on service providers for business continuity and disaster. Only three of the twenty-two FSPs (P10, P16 & P19) have a business continuity and disaster recovery plan in place (Appendixes F10, F16 & F19). The lack of strategic planning among FSPs is another indicator of their lack of CC readiness. The lack of time needed to implement new technologies such as CC, lack of in-house expertise, and lack of adequate security measures by the FSPs signifies a lack of readiness in the FSPs.

FSPs lack the time needed to implement new technologies like CC. This is because they do not have enough staff and the few staff that they have are already overloaded with work, leaving no time for the implementation of new technology. This is a major hindrance to CC implementation by FSPs and could be another reason why the FSPs are not able to use CC for their core business activities.

Finding 14: Many FSPs lack the time needed to implement new technologies like CC because they have a limited number of staff.

This research found that training is inadequate for FSPs on CC. Only five of the participating FSPs have training and development programmes in place. Seventeen of the participants mention that only a few of their staff knows about CC, which is a serious hindrance to the rapid adoption of CC. P13 notes that “some of us have the needed skills, but others need some form of training.” (Appendix F13). Two of the participants (P6 & P9) also noted a reluctance from their staff due to the fear of new technologies. As P6 mentions: “the biggest issue for us is awareness. Many of my staff are not aware of Cloud Computing and it makes me reluctant to use it for core activities because of the fear of possible resistance from my staff due to their fear of technologies.” (Appendix F6). P9 confirms that “some employees are resistant to change because of the fear of technologies.” (Appendix F9).

Both P6 and P9 suggest that training and development of staff on CC usage could help to improve the situation by boosting the confidence of such employees and helping to reduce employee’s resistance to the changes brought about by CC. Out of all the participants, only P3 and P22 said that they have training and development programmes in place to provide essential training for their employees on CC and other technologies.

Participants P2, P5, P6, P7, P8, P11 and P16 mention that their lack of training is holding them back. To provide an immediate solution to the lack of training, P16 suggests that at least one employee with ICT knowledge should be tasked with providing other employees with some form of training.

Finding 15: The lack of training contributes to the slow rate of CC adoption among FSPs.

There is a lack of in-house CC expertise among the participating FSPs, meaning that there is limited technical knowledge of CC among employees in the participating FSPs. In terms of the necessary technical skills, all the participating FSPs have at least one staff member who is knowledgeable about CC, but their knowledge is limited. The majority of employees in the participating FSPs have little or no technical knowledge. This research also found that the reason for the lack of expertise in-house is that the FSPs do not have the financial capacity to employ needed ICT experts. That could be another reason why the majority of the participating FSPs are not yet using CC for their core business activities as they do not have an in-house ICT expert that could guide them through the process.

Finding 16: There is a lack of in-house expertise among the FSPs because many of the FSPs cannot afford a dedicated ICT expert.

It would be beneficial to the FSPs if more employees had knowledge of CC. Having a single person running CC becomes a serious failure point. It is interesting that two of the owners of the FSPs (P1 & P3) interviewed have degrees in Information Technology and are the driving forces behind their organisations CC initiatives.

Technological factors to carry out their daily business activities need to be investigated. These factors may include existing technologies that the FSP already have and use, and technologies in the market not yet acquired. This research found that the participating FSPs are aware of different CC applications for conducting general business activities, but their awareness of CC applications to conduct core business activities is limited. Appendix G shows a full list of CC technologies used by the participating FSPs.

FSPs are currently using CC for general business activities such as communication and advertising, but the core business activities are still being carried out using in-house systems.

This section details the benefits of CC as experienced by the participants. The benefits mentioned by the participants cover most aspects of CC such as cost, infrastructure, access, ICT support requirements, updates, time to market, billing, installation, upgrades, maintenance, storage, communication and collaboration.

The elimination of the need to purchase, install, maintain or upgrade software and hardware leads to cost savings for CC users. Cost reduction appears to be the main benefit of CC that attracts the participating FSPs because almost all the participants mention that cost reduction as one of the main reasons why they adopted CC.

> “The cost reduction it brings and the time you can save by leaving the installations, maintenance and upgrades to the service providers is something I really like about cloud computing. Personally, I think the high cost of purchasing a server and even maintaining it attracted me to use IaaS for storage. It is cheaper when I look at the cost of buying and

maintaining a server. The SaaS applications that we use are also cheaper because we only pay if we use them. We did not have to buy or pay license fees for them. Basically, its low cost and accessibility is something that attracted me." (P1; Appendix F1).

According to P6

"It is cheaper, and we only pay per-use. So, we can minimise the cost by using it only when it is necessary. For me, it is cost-effective. It saves me money on infrastructure cost, and as a small business, that's important to me. I do not have to buy everyone that works for me a computer. Most of them have their own device like smartphones and ipads, which they use to access these applications." (Appendix F6).

P11 argues that "The low cost of entry and the fact that we don't have to worry about the maintenance of the infrastructure is a big influence for me." (Appendix F11), while P12 believes that "The ease of use and the cost reduction are some of the factors that made me adopt cloud computing." (Appendix F12).

The low cost of CC is one of the major benefits of CC that has caught the attention of many FSPs. The pay-as-you-go model of CC allows FSPs to maximise their resources. Since the service providers carry out the installation, maintenance and upgrade of CC resources, this frees up some time for FSPs, thereby allowing them to focus on their core business activities. The ability to scale up or down depending on business need is another benefit of CC that attracts FSPs towards CC adoption.

Finding 17: The participants have a good understanding of CC but indicated that the employees of the FSPs do not have such understanding.

The billing system of CC, which allows users to pay per usage, is another benefit of CC that has garnered the interest of FSPs. According to P3, P4, P7, P10 & P12, CC allows FSPs to maximise their resources as they no longer have to purchase under-utilised resources, which translates into cost savings for FSPs (Appendixes F3, F4, F7, F10 & F12).

P4 said that "it is also cheap as we only pay for what we use, so there is no waste of resources." (Appendix F4). P6 agrees and states that "improved resource utilization is another thing I like about cloud computing as it helps us to avoid waste and save our resources." (Appendix F6). P12 is of the opinion that "The pay-as-you-go" system suites their ICT needs and explained that "the provision of software, hardware and other ICT infrastructure to users over the internet on a pay-as-you-go basis just like our cell phones makes business processes easier." (Appendix F12). P15 is of the opinion that "Cloud Computing allows people to use computing resources which are provided by hosting companies over the internet on a pay-per-use basis." (Appendix F15).

Finding 18: CC allows FSPs to maximise the use of their resources.

The ease of use of cloud applications and the fact that anyone with basic computer skills can use most cloud applications makes it attractive for FSPs (P2; P4; P12 & P17). “The low cost, ease of use and the accessibility of cloud computing influenced my decision to adopt cloud computing,” said P4 (Appendix F4). According to P12, “The ease of use of cloud computing applications, the cost reduction, improved storage capacity and reduced workload from our side in terms of things like installation, upgrades or maintenance because the service provider does that for us.” (Appendix F12).

Finding 19: The participants find CC easy to use, helping to reduce resistance to change; however, the employees struggle with the concept.

CC offers customers with business continuity because the service providers often have business continuity and disaster recovery plans in place to ensure that there is no interruption in case of a disaster. Although CC service providers often have business continuity and disaster recovery plans in place, most of the participants are not aware of these as stated by P11, P12, P14, P15, P17 and P18 (Appendixes F11, F12, F14, F15, F17 & F18). The lack of business continuity and disaster recovery plans are best described by P14, who stated: “no, we do not have business continuity and disaster recovery (BCDR) plans in place.” (Appendix F14). P22 ss not sure and states that “we do not have any business continuity and disaster recovery plans in place, but I think our service provider caters for that.” (Appendix F22).

P13, P20, P21 and P22, on the other hand, are aware that the service provider offers them business continuity and disaster recovery as part of their CC package as P13 indicates that “none in-house but the service provider offers business continuity and disaster recovery as part of their package.” (Appendix F13). P20 said that “it is provided by the service provider” Appendix F20). P21 also said, “our service provider has back up for all our data.” (Appendix F21). P10 notes that they have business continuity and disaster recovery plans in place. P16 and P19 both note that they kept their traditional systems as backups in case they encounter any problems with CC.

> “The only plan that we have is that we switch back to our old manual system whenever there is a problem with the cloud application. We then transfer all the data to the cloud application once the system is back online. This means double work for us at times, but that is what we do.” (P16; Appendix F16).

Finding 20: There is little awareness of the business continuity and disaster recovery plans of the service providers among FSPs.

The on-demand capability of CC makes it easy for users to introduce new products to the market timeously because they can focus on the core activities of their business since the service provider takes care of most of the technical requirements (P1; P2; P5; P8; P10; P14 & P19). “Improved

competitiveness is one reason why I adopted cloud computing because it allows us to focus on other important things while leaving ICT-related issues to the service providers. Hence, we can introduce new products to the market on time." (P6; Appendix F6). P9 is of the opinion that "Internal resources are freed up, and we can focus on our core activities." (Appendix F9).

The management of the ICT infrastructure by the service provider is a significant benefit for many FSPs. P14 indicates that "since the service provider takes care of the installation, maintenance and upgrades of the cloud applications, this gives us time to focus on our core business activities and thus allows us to reach out to the market in a timely manner." (Appendix F14). The CC offering clears the agenda of many FSPs managers and resources, allowing them to get to their clients quickly and efficiently. This saving of time is confirmed by P19 who said "With cloud computing, we are able to be up and running in no time as we can reach the market in a matter of minutes after setting up. The faster time to market is important to me as time is very important in our kind of business." (Appendix F19).

Finding 21: The ability to introduce new products to the market is of high importance for FSPs.

The availability and reliability of CC are two of the main attractions of CC for FSPs. The majority of service providers guarantee over 99% uptime, and this attracts FSPs (P7, P8, P21 & P22; Appendixes F7, F8, F21 & F22). P8 states "the service provider promises high availability which to me is an assurance that we can rely on the service. The high availability is of a high importance to us as we cannot afford to be offline." (Appendix F8). P21 and P22 mention that the lowering of costs, flexibility and availability is the main reasons for implementing CC (Appendixes F21 & F22).

Finding 22: The high availability of CC is one of the main reasons why FSPs are attracted to CC.

The ability to scale up or down depending on the business need is one of the benefits of CC that attracted the participating FSPs to CC. P3 said that "the increased flexibility, better collaboration, lower cost, improved scalability and reduced need for ICT personnel are things I love about cloud computing. It really makes things easier." (Appendix F3).

Adaptability is also a main benefit for FSPs. P6 states that "I also like the adaptability of Cloud Computing as it is able to cater for changing user requirements. For example, if my business grows and I need access for new workers, I can get them going almost immediately with Cloud Computing." (Appendix F6). P8 finds the ability to increase or decrease the resources appealing. "The nice thing about CC is that one can increase or decrease the resources as the business grows." (Appendix F8).

Scalability and flexibility are also benefits utilised by FSPs. P16 states "it is also scalable and flexible. For example, I can increase or decrease the number of employees with access to the cloud applications based on my business needs." (Appendix F16).

P19 introduces the concept of “working from home” as a benefit of CC. “We are also able to work from home or anywhere we are as long as we are connected to the internet. That flexibility is one of the factors that influenced us to adopt cloud computing.” (Appendix F19).

Finding 23: The ability to scale up or scale down depending on business requirements is also an important reason why FSPs are adopting CC.

The participants note that CC allows them to reach out to more customers with limited resources in a timely manner. “It saves a lot of time as we are able to reach more customers in limited time.” (P5; Appendix F5). “Being on the internet, it has given us the opportunity to make more customers. In other words, it has expanded our customer base.” (P16; Appendix F16). P22 supports P5 and P16 by saying that “it also expands our reach as it allows us to access more customers.” (Appendix F22).

Finding 24: The ability to reach more customers timeously is among the main reasons why FSPs adopt CC.

CC provides users with the latest and updated versions of the software as updates are performed automatically by the service providers. This saving of time can be used on core activities of the business (P8, P17 & P20). P17 states that “The automatic updates that it provides means that we do not have to waste time updating the software ourselves. This saves us time.” (Appendix F17). Furthermore, P20 is of the opinion that “It provides us with latest versions of software without us having to worry about updates. That saves a lot of time for us. It also saves cost for us because we don’t have to buy expensive hardware and software.” (Appendix F20).

Although having an up-to-date version of the software offers many benefits, P16 notes his unhappiness about automatic updates as there are times when some functionalities of the software are changed or hidden after an update. They have to spend a significant amount of time to figure it out. This is rather important as it can disrupt the management of the ICT department. P16 argues that “I also have a problem with the automatic updates because there are times when the service provider updates the applications and some functionalities become hidden and it takes us time to figure them out.” (Appendix F16).

Finding 25: CC provides FSPs with automatic updates which saves them time needed for upgrades.

Finding 26: CC saves a lot of time for FSPs and affords them the opportunity to focus on their core business activities.

CC allows smaller organisations such as the participating FSPs to be able to compete with larger organisations by providing the smaller organisations with resources which they would typically not be able to afford. P5 debates that “It allows us to have access to resources that we might not have been able to afford. These are resources that only the big companies could afford in the past, so it gives us access to compete with larger organisations.” (Appendix F5). P18 supports this argument,

stating: “CC has given us the opportunity to use technologies that we could not afford to use in the past. We can now use the same technology that only the rich and bigger organisations could use in the past.” (Appendix F18).

Finding 27: CC provides SE’s with the same resources as LE’s, thereby allowing them to be able to compete with LE’s.

The participants note that the elimination of the need to install, maintain and upgrade the CC applications from the user’s side allows them to free up valuable time which is used to attend to the core activities of the business. Again, the time made available for other business issues came up. P2 said that “the no installation, maintenance and upgrades from our side is one of the things I like about CC.” (Appendix F2). This is supported by P6 who states that “The fact that we don’t have to bother about installation, upgrades and maintenance makes me fall in love with it as most us are not so good with things like that.” (Appendix F6).

This also leads to a quicker implementation as the time saved leads to shorter deployment times. P9 introduced the technical advantage on set up and maintenance of the services.

> “I also like the simplicity of Cloud Computing because all the technical issues like the setup and maintenance of ICT infrastructure are done by the service provider so we can focus on our core business. The reduction in the need for hardware investment is also something I like about CC. Improved access to resources like software and hardware.” (Appendix F9).

P12, P14, P15 and P22 support this view, stating (respectively):

> “The ease of use of Cloud Computing applications, the cost reduction, improved storage capacity and reduced workload from our side in terms of things like installation, upgrades or maintenance because the service provider does that for us.” (P12; Appendix F12).

Finding 28: FSPs can focus on their core business activities because the SP’s assist them with the installation, upgrades and maintenance of the resources.

The use of CC helps to improve communication and collaboration among staff (P9; Appendix F9). It also improves communication and collaboration with customers, business partners and other stakeholders. “It’s the ability to improve communication and collaboration is definitely one reason why I like CC. The improved communication with customers, workers and business partners are also among the reasons why I like Cloud Computing.” (P6; Appendix F6).

Finding 29: CC helps to facilitate collaboration among FSP employees and customers, thereby improving communication among them.

CC P6 and P21 debate that CC is friendly to the environment, and it supports green ICT. P6 states that “also, it is environmentally friendly and it’s a form of green ICT.” (Appendix F6). P21 said “Cloud Computing reduces paperwork since it is online. It therefore helps in saving our planet by reducing the need to destroy trees used in making papers.” (Appendix F21).

Finding 30: CC contributes to green ICT as it helps to reduce the need for papers.

There is a reduced need for in-house ICT staff because the majority of the technical requirements are carried out by the service providers, leading to cost reduction as the reduced number of ICT personnel means savings on salaries meant for the extra ICT personnel’s (P2; Appendix F2). P8 supports this by stating that “there is no need for ICT experts as the complex ICT operations are performed by the service providers so, it makes things easier for us.” (Appendix F8). P13 and P21 confirm this by stating respectively that: “I also like the fact that it reduces the need to hire specialised ICT personnel because most of the technical stuff is handled by the service providers” (Appendix F13), and “it also reduces the cost of ICT personnel because most of the tasks that require ICT personnel are done by the third-party service providers.” (Appendix F21).

Finding 31: CC reduces the need for ICT personnel.

Cloud applications allow multiple users to access the same data at the same time by allowing one user to edit the data at a given time while others have access to a read-only option. This ensures data integrity and improves collaboration among staff, as this functionality allows them to work in groups on the same project. Data management, according to the participants, is easier and more effective. P4 mentions that “One or more employee can also access the data store at the same time by accessing a read-only version which also assists in ensuring the integrity of the data as only one person can edit it at any given time.” (Appendix F4). P11 states that: “It allows us to store more data that we were able to store with our in-house storage, and it also improves our access to data by allowing us to access new sets of data.” (Appendix F11). P19 states that it improves access to data by saying: “It improves access to data because we can now access huge amounts of data as quickly as possible.” (Appendix F19).

Finding 32: CC provides FSPs with access to large volumes of data.

Finding 33: Several employees can access the data at the same time.

CC allows users to increase storage on demand as their data grows. This makes it easy for users to access more storage without having to worry about purchasing or maintaining the servers. P2 states that:

> “The cost reduction, ease of use, ability to reach more customers, easy deployment of new products to the market, automatic updates, no installation, maintenance or upgrades from our

side, improved communication and collaboration, reduced ICT support, business continuity, more storage capacity and so on are some of the things I like about CC." (P2; Appendix F2). P5 mentions that "the improved storage capability is also something I like about cloud computing." (Appendix F5). P11 adds that "it allows us to store more data than we were able to store with our in-house storage." (Appendix F11). P12 is of the opinion that: "The ease of use of CC applications, the cost reduction, improved storage capacity and reduced workload from our side in terms of things like installation, upgrades or maintenance because the service provider does that for us." (Appendix F12).

Finding 34: The on-demand functionality of CC provides FSPs with more storage capacity.

CC reduces the need to purchase sophisticated ICT. The users can access CC with just a basic computer, or even a cell phone. This contributes to the reduction in costs for FSPs (P2, P5 & P17; Appendices F2, F5 & F17).

P5 mentions that "since we have little investment in infrastructure, the low infrastructure requirement of CC is something that I like about it." (Appendix F5). P17 confirms that they "also like the fact that we do not have to buy expensive computers because even the cheapest and the most basic computer is enough to access CC." (Appendix F17). The lower requirements for infrastructure and the ability to pay on a "pay-as-you-go" basis makes the management of ICT needs simpler. P22 confirms by stating that "The infrastructure requirement is low. For example, we don't need to have our own servers. The service provider owns the servers, and we only pay for it when we use it. This makes it cheaper and affordable for us." (Appendix F22).

Finding 35: The low infrastructure requirement of CC makes it easy for FSPs to adopt CC.

The possibility to access CC applications from anywhere at any time is one of the main benefits identified by 10 of the participants mention that CC allows them to work from home or anywhere, they are at any given time. The participants note that this is one of the reasons why FSPs are turning to CC. "CC has improved our mobility. We are now able to work from anywhere at any time." (P4; Appendix F4).

Finding 36: CC allows FSPs to be more mobile as employees can work from any place at any time.

The pressure that FSPs experience from competitors also plays a role in the adoption of CC. "The pressure from competitors is something that attracted me. Most of the FSPs in my sector around me are using CC services, and they are reaping the benefits so, why not my business too?" (P6; Appendix F6). The pressure from competitors can lead FSPs to adopt CC, and it can improve the performance of FSPs as they strive to be better than their competitors. P3 argued that they do not want to be left behind by saying "the need not to be left behind as others are already using it is another reason why we adopted CC." (Appendix F3). P8 realises that the "competitive pressure and the need to survive is the main reason why I opted for CC." (Appendix F8). P18 saw it as a new thing

and said “it’s a new thing and most of my competitors are either using it already or planning to start using it. So, it is important to also use it to keep up with others in the market.” (Appendix F18).

Finding 37: The pressure from competitors is among the reasons why FSPs adopt CC.

Security and privacy issues appear to be the biggest concern for the participating FSPs. Sixteen of the twenty-two participants noted their concern about the security and privacy of their data due to loss of control over data. With CC, the service provider has more control over data than the FSPs. P1 words the concern as follows: “I am concerned about security and privacy of data. Although we have a service level agreement and the service provider promises the security of our data, I still have my reservations.” (Appendix F1). Participants 3, 6, 7, 11, 12, 16 and 17 voice their concerns about the security and privacy of their data (Appendix F12 & F17):

P4 explains that “the security issue (of CC) is something I don’t like about CC (Appendix F3). (P3); P6 adds that “the security and privacy concerns are two things I don’t like about CC.” (Appendix F6). The security and privacy are issues further explained by P7 who refers explicitly to the data confidentiality of their clients stating “The security and privacy issues of CC is a big problem with CC, and there is a risk involved. Our data might be exposed to an unwanted person if care is not taken.” (Appendix F7). P11 contributes to the security discussion by saying “The security and privacy of data are of major concern for me. The dependence on the internet is another major issue for me as the cost of internet is still very high.” (Appendix F11); “The security and privacy issues around CC is also an issue for me.” says P12 (Appendix F12).

To reduce or eliminate the issues associated with CC security and privacy, P20 suggests that FSP’s should conduct a thorough investigation about the issues related to security and privacy in CC and come up with reasonable measures to reduce or eliminate them before adopting CC. P20 said: “understanding all the security issues and what to do to minimise or eradicate them is important. I would suggest the FSPs do some research about the security issues of Cloud Computing and how to resolve them before moving to the cloud.” (Appendix F20).

Finding 38: The security and privacy issues of CC are the main reasons why FSPs are reluctant to use CC for their core business activities.

The location of data is dependent on the service provider, and this may lead to slow access to the data due to latency if the data location is very far from the user. It may also lead to legal or jurisdictional issues. For example, if the service provider stores data in a location with different laws and regulations from that in the location where the user is situated, it could result in legal or jurisdiction issue. For example, P1 states that “I am also concerned about the location of the data. I am also concerned about the possibility of vendor lock-in as well as compliance and legal issues.” (Appendix F1). According to P20 “some of the issues to consider are security and privacy issues like data locality, data integrity, data access, data breaches and data segregation.” (Appendix F20).

Finding 39: Legal and compliance issues and the possibility of data lock-in prevent FSPs from fully adopting CC.

Four participants (P3, P4, P5, P6) also raise concerns about legal issues that may arise regarding data ownership, especially in cases where the service provider stores data in locations different to that of the users, and where the laws are different from those where the user's business is located. The lack of adequate laws and regulations regarding CC in SA is another concern raised by the participants, and seventeen of the participants note that they are not aware of any law or regulation in SA that caters for CC. Only P3, P4, P5, P6 and P8 highlighted the possibility of a legal issue arising in cases where the service provider stores data in locations different from the location of the FSPs and where the law and regulations may be different. P3 notes that: "I have not experienced any, but I am aware that some service providers that offer storage services might have their servers located in other countries which may lead to legal and jurisdiction issues in cases where there is a problem with the data." (Appendix F3). P4 points out that:

> "The issue of compliance in terms of the legal aspects relating to the storage of customers data outside our company is something I dislike about Cloud Computing. Lack of regulation is something I don't like about Cloud Computing as it leaves the users with no clue about their legal rights in terms of problems with their data." (Appendix F4).

P5, P6 and P8 are also concerned about compliance issues. P5 points out that: "The location of data and methods used for data protection by the service provider is unknown to us, and I don't like that." (Appendix F5). P6 is concerned about the physical location of the data and said that "The problem with where data is physically located is also of concern to me because it may lead to legal or jurisdictional issues." (Appendix F6).

As FSPs operate in a highly regulated environment, regulatory and compliance issues are paramount and care must be taken on where the data is hosted. P8 states that "the possible regulatory and compliance issues that may arise if the service provider stores the data in a different country or in a place where the law is different from that of the place where the business is located." (Appendix F8).

Finding 40: FSPs operate in a highly regulated environment, and as a result, the location of their data is important to them to avoid legal and jurisdictional issues associated with data location.

Finding 41: A good understanding of the legal and jurisdictional issues of CC can assist FSPs in minimising the management challenges of CC.

The reliance of CC on the internet is a major issue encountered by all twenty-two of the participating FSPs, as they all mentioned the difficulties they experience with CC access whenever there is an internet connectivity issue. The high cost of bandwidth in SA makes internet access a major

hindrance in the use of CC (P7). P10 also note that the speed of the internet is an issue, as there are times when the internet speed is too slow, and it takes too long to access data.

> "The high cost of bandwidth for internet connectivity and the speed of the internet is an issue. There are times when the internet is completely down, and there are times when it is too slow. It takes maybe an hour to access what should normally take a minute. That is not good for our business." (Appendix F10).

According to P3:

> "The biggest issue we have encountered was outage when we could not access the service and customers were frustrated as we needed to check their credit record to decide whether to give them a loan or not. We had to call the service provider and wait until they resolved it before we were able to assist the customers." (Appendix F3).

The challenges FSPs face in terms of the availability of internet services is of concern. P6 is of the opinion that "the issue with availability is also something I dislike about CC. It could be either because there is a problem with internet service or because there is a problem with the service provider. This could result in disruptions in our service to our customers." (Appendix F6). The disruptions caused by the issues with internet connectivity could lead to loss of income for the business. "The possibility of service disruptions can lead to loss of income for the business." (P9; Appendix F9). P11 confirms that "the dependence on the internet is another major issue for me as the cost of internet is still very high." (Appendix F11). P13 dislikes CC because of "its dependence on the internet as well as the security and privacy issues are two of the things, I dislike about CC ." (Appendix F13). P18 also dislikes CC because of "the reliance on the internet is not a nice thing about Cloud Computing." (Appendix F18).

The dependence on the internet is of significant concern for most of the participants because of the downtimes that arise when there is a problem with the internet. The high cost of internet in SA is another reason why the participants are concerned about the dependence of CC on the internet. P21 notes that it is important to find a reliable internet service provider as this can help in reducing the downtime arising from internet problems.

Finding 42: The internet is too expensive for many of the FSPs.

Finding 43: There is a need for FSPs to find a reliable internet service provider (ISP) and to have alternative ISP in case one ISP does not meet their expectation since the internet is an important requirement for CC.

Thirteen of the twenty-two participants (P4, P5, P6, P7, P10, P11, P12, P13, P16, P17, P20, P21 & P22) note that they have staff members who do not have the necessary knowledge about CC. As a result, those staff members are unable to utilise CC effectively. P4 notes that the ICT skills requirement of IaaS and PaaS are more than that of SaaS, and as a result, training is required to

encourage more FSPs to adopt IaaS and PaaS. Supporting P4, P7 also notes the importance of training in improving staff knowledge and skills about CC. P12 suggests that training can help to improve employee's knowledge about CC and improve their confidence in CC. P7 states that "I think training the staff on how to use Cloud Computing is essential before deployment takes place." (Appendix F7). According to P3, the "biggest issue is that my workers have little or can I say insufficient knowledge of Cloud Computing." (Appendix F3). P12 iterates that "it is important to make sure that your employees are knowledgeable about Cloud Computing and confident in using it. Maybe training can help with that." (Appendix F12). P5, P6, P7, P11 and P13 are all in agreement on the importance of training of employees on CC.

P11 and P20, on the other hand, mention that they are knowledgeable when it comes to ICT and they train their employees on any technology they need to use. "I try to train my employees by myself on how to use the Cloud Computing applications that we use." (P11; Appendix F11). P20 also are of the opinion that:

> "for technical skills, most of my employees are not technically inclined. For soft skills like managing the service provider relationships, I am very good with that. I am also ICT savvy, so I am able to train my employees on how to use any technology that we need to use." (Appendix F20).

According to P16, training an employee by one's self can be time-consuming and may waste much valuable time needed to make important management decisions. P14 states that: "The main issue for us is the lack of training. We are a small organisation and cannot afford the training on how to use some of these applications. We are forced to learn on our own in most cases, and that can be time-consuming." (P16; Appendix F16).

The importance of training cannot be overemphasised as training has the potential to boost the morale of employees. Hence, P22 suggests that training should be provided for all employees before the implementation of any new technology by saying "most of us have the needed skills and we always opt for training before we start using a new application." (Appendix F22). P8 said that "training and development should be offered to staff members as this can increase their readiness level and make them more aware of CC and how to use it effectively." (Appendix F8). In addition to ICT skills, P16 mentions that CC requires some soft skills such as negotiation skills, conflict management skills, contract management which are essential in managing the relationship with the service provider. P16 said: "to manage the relationship with the service provider one needs to possess some soft skills like negotiation skills, conflict management skills, contract management skills and so on because they are vital in ensuring that the service provider lives up to expectations." (Appendix F16).

Finding 44: FSPs need to improve their knowledge and skills of CC.

Finding 45: Many FSPs have no training programme in place to equip staff with the needed skills.

Finding 46: Training and development of staff is important for FSPs to boost the confidence of their staff reduce resistance to change by staff.

There are concerns among nine FSPs (P4, P5, P7, P8, P9, P15, P17, P21 & P22) about the migration of data from their legacy systems to CC. They also raise concerns about the integration of in-house systems with CC, which could sometimes be difficult or even impossible. “The issues with migration are also a problem as it can be difficult to migrate some in-house applications to the cloud. Integrating some existing in-house traditional ICT with Cloud Computing can also be difficult.” (P4; Appendix F4). However, this research finds that there is disagreement among participants about migration issues. For example, P4 believes that migration and integration are sometimes complex, while P5 believes that migration is relatively easy. P5 argues that “I like the ease of migration as we initially thought it would be complex, but it was easier than we thought to migrate. The migration process was quick and easy.” (Appendix F5). Although P5 believes that migration to the cloud is relatively easy, he noted that migration and integration could be challenging at times for different reasons. For example, it could be difficult to manage the migration from one service provider to another service provider because the applications might be platform dependent. P5 said: “I am concerned about compatibility issues with our existing systems. There is a lack of standardisation among cloud providers, making it difficult to move from one service provider to another in case one is not happy with the services of a service provider.” (Appendix F5). P13 highlights that “another issue is that it is sometimes difficult to integrate existing applications with Cloud Computing applications.” (Appendix F13). Integration is a challenge for many (9) FSPs.

P7, P13, P17 and P22 suggest that it is important to conduct a thorough investigation before adoption to determine how to integrate existing applications with CC to prevent issues that may arise during integration. P7 suggests that “doing a proper investigation on how to integrate the existing applications with Cloud Computing is also important before deployment as it will allow us to identify and select applications that can be easily integrated with our existing applications.” (Appendix F7). P13 also said, “the organisation should first investigate the possibility of integrating their existing applications with the intended cloud applications before adoption to ensure smooth deployment.” (Appendix F13). Doing research before adoption and implementation is important, as stated by P17 and P22 respectively: “to overcome the issue of integration, one should do research and find out the possibility of integrating the cloud computing application with existing applications before adoption.” (Appendix F17). “it is important to conduct research about the possibility of customisation and integration of the cloud application upfront to ensure that the chosen Cloud Computing application caters for customisation and integration with existing applications.” (Appendix F22).

Finding 47: The migration to the cloud can sometimes be complex because it might be difficult to integrate some in-house applications with CC.

Finding 48: There is a need for FSPs to investigate the possibility of integrating their in-house application successfully before adopting CC.

An important issue raised by three of the participants (P4, P8 & P9) is that level of readiness of an organisation affects their ability to adopt CC successfully. This research found the FSPs adopt CC without assessing their level of readiness, and as a result, they struggle to implement CC successfully. A detailed discussion of the adoption readiness is provided in section 4.6.2.

The adoption readiness of the participating FSPs led to two findings (finding 49 and 50).

Finding 49: The FSPs have no systematic approach to the adoption of CC in place because they do not assess their level of readiness before adopting CC.

Finding 50: Many FSPs have no CC strategy in place.

The small organisations such as the participating FSPs find it difficult to have dedicated ICT personnel to manage their technological issues. Bigger firms, on the other hand, can dedicate some of their staff to issues that require technical expertise. P8 argued that "the firm size because bigger firms will have the capacity to dedicate some staff members to technological issues, security and privacy issues." (Appendix F8). P17 supports P8 by saying that:

> "Being a small organisation whose core business is not ICT, we are unable to dedicate someone to our ICT needs. I'm sure the bigger organisations might not have all the technical problems that we have as they can afford to dedicate someone for their ICT needs. For us, we rely on the service provider for everything, and they sometimes take time to respond." (Appendix F17).

Finding 51: The small size of the participating FSPs makes them unable to employ dedicated ICT personnel.

The control of data stored in the cloud shifts to the service providers, because they own the servers and control access to the server and the data stored on it. This makes FSPs uncomfortable as they feel that no one should have control of their data except themselves. The loss of control is an issue as highlighted by P5, stating that "the loss of control over that is one thing I completely dislike about CC." (Appendix F5). P9 said that "the loss of control over data is also a concern for me as the service provider has more control over the data that is stored on their server." (Appendix F9). P19 verbalises the issue by saying that "the service provider also has more control over data than us. That is something I definitely dislike about Cloud Computing." (Appendix F19).

Finding 52: FSPs are reluctant to use CC for their core business activities because of the possibility of loss of control over data.

One of the disadvantages of CC mentioned by the two of the participants (P5 & P9) is a lack of standardisation which could result in data or vendor lock-in (P1, P12, P14, P17 & P21). This would make it challenging to migrate from one service provider to another. It may also lead to integration

issues when integrating with existing ICT systems. These issues make ten of the participating FSPs (P1, P5, P6, P9, P12, P13, P14, P17, P21 & P22) reluctant and afraid of CC because they cannot imagine being at the mercy of a service provider whose services, they are unhappy with. P5 (Appendix F5) states that "There is a lack of standardisation among cloud providers. It might be difficult to move from one service provider to another in case one is not happy with the services of a service provider". P9 also mentions that "The possibility of data lock-in, the possibility of losing critical business data and less tailored software as the service provider tries to provide a solution for everyone." (Appendix F9).

Finding 53: The lack of standardization and the possibility of data lock-in makes FSPs reluctant to adopt CC fully.

Three of the participants (P6, P13 & P22) say that it can sometimes be difficult to customise CC applications because the service provider tries to make it too general to in order to meet as many needs of clients as possible. In the process, they complicate the CC implementation. This makes customisation more difficult as more work needs to be done by technical staff to customise the applications. According to P6, "the lack of customisation is something I also don't like about cloud computing." (Appendix F6). P13 agrees saying, "it is not easy to customise most Cloud Computing applications as they are generally 'one size fits all', and are made for everyone. This is a problem because there is no uniqueness in that" (Appendix F13).

P22 also noted that:

> "The lack of customisation of cloud applications is a problem as it does not make you different from competitors who are using the same application from the same service provider…it is important to research the possibility of customisation and integration of the cloud application upfront to ensure that the chosen cloud computing application caters for customisation and integration with existing applications." (Appendix F22).

Finding 54: It is difficult to customise some CC applications, and this demotivates some FSPs who require uniqueness.

One of the participant's (P5) notes that the lack of adequate support from the government is one of the disadvantages of CC. He also notes that government support in terms of regulations and bandwidth could provide some support for CC and improve the confidence of FSPs in adopting more CC offerings. Three of the participants note that the government is not doing enough to support CC in terms of funding and regulations. P5 said "I think government support is important here in terms of things like regulations, review of laws relating to data protection and privacy and improved bandwidth availability. This will improve adoption and give prospective users more confidence." (Appendix F5).

P14 agrees with P5 by saying that “the government should develop laws and regulations that can guide the cloud computing market. They should also provide funding for FSPs to encourage the use of cloud computing among FSPs.” (Appendix F14). P11 suggests that “government needs to regulate the cost of internet to ensure that they are affordable for small businesses.” (Appendix F11).

Finding 55: Government support for CC is inadequate, and this reduces the confidence of FSPs on CC.

The users are not able to determine the total cost of CC upfront as the cost depends on their actual usage. This limits their ability to plan and budget effectively. P6 indicates that the management of finance is a problem. P6 states that “one thing I dislike about Cloud Computing is the lack of ability to know the exact cost upfront as this limits our ability to plan our budget effectively.” (Appendix F6).

Finding 56: FSPs are unable to determine the total cost of CC upfront. Thus, they are afraid that they will be unable to plan and budget effectively.

One of the participants (P6) mentions that the majority of his staff are not aware of CC. He further states that although many of them are already using CC applications such as Gmail and Facebook, they are not aware that they are using CC. “The biggest issue for us is awareness. Many of my staff are not aware of Cloud Computing, and it makes me reluctant to use it for core activities because of the fear of possible resistance from my staff due to their fear of technologies.” P6 (Appendix F6). P10 said that “Lack of awareness is one issue because we are limited in our knowledge of Cloud Computing. We only know a little about it. Some of our employees don’t even know anything about it.” (Appendix F10).

To improve awareness among staff, P6 suggests that training should be provided to staff members. P10 also suggests that it is important to conduct extensive research about technology before adopting it to create more awareness and to guarantee successful adoption and implementation.

Finding 57: Many of the employees in the participating FSPs have little awareness of CC.

There is a possibility of unsolicited advertising from the cloud application, which could become a source of distraction. P9 points out that “Some of the applications have unsolicited advertising which can be irritating at times, especially when you are in the middle of something important.” (Appendix F9). P20 is also annoyed with advertisements, saying, “Some CC applications have advertisements in them which pop up while you’re doing something important. That could be a source of distraction and can affect our productivity if care is not taken.” (Appendix F20).

Finding 58: Some CC applications have unsolicited advertisements which can negatively affect the productivity of FSPs as it can distract them.

The number of service providers offering a specific CC application or service is always limited according to the FSPs. This perceived lack of adequate number of services providers offering CC

applications that could be used for core business activities like banking or customer relationship management leads to little or no competition among the services providers. Hence, the lack of service providers makes them to be relaxed and care less about the quality of service they offer. “The lack of enough service providers gives the few available ones the chance to do what they like.” (P9; Appendix F9).

Finding 59: There is a limited number of CC service providers, which leads to limited competition among the SP’s and gives the SP’s more power over the FSPs.

All the participating FSPs are already using one or more forms of CC. Thirteen of them (P4, P5, P6, P7, P10, P11, P12, P13, P16, P17, P20, P21 & P22) note that not all their employees are knowledgeable about CC, and some are using it without knowing that they are using it. When asked about the forms of CC used during the interviews, some of the participants mentioned that they use both SaaS and IaaS, while others noted that they only use SaaS. None of the participants mentioned that they use PaaS. For communication with customers, staff, business partners and other stakeholders, Gmail and Facebook are the most common SaaS applications used by the participating FSPs. Facebook is also used for advertising and promotions by the participating FSPs. Another SaaS application mentioned is Office 365, which provides them with productivity tools such as Microsoft Word, Microsoft PowerPoint, Microsoft Excel etc.

P1 mentions that the use an online business management and accounting application known as SMEasy, which is a SaaS application. Also, for their electronic banking, electronic accounts and electronic payments, they use Kineto. P11 said that they use Kineto, a SaaS application. P1 notes that he heard of another SaaS application called Sage, but they are not using it. He added that Sage is an accounting and payroll solution, and he is currently doing some research on how it can help his business. For recruitment, P1 said they utilise Linkedin. P1 indicates that:

> “We use tools like Gmail and Office 365 for business, and SMEasy for online business management and accounting capabilities. We also use a platform the Kineto for things like e-banking, e-accounts and payments solution. I have heard of Sage which provides integrated accounting and payroll solution, but we are not using it yet, I am currently looking into it. For our recruitment, we use Linkedin, which I believe is also Cloud Computing.” (Appendix F1).

P1 also notes that they use IaaS because of the servers provided by a service provider called PointClick for storage. “For our storage, we use a company called PointClick. They deal with the storage of all our data, and we have a service level agreement that guarantees the protection and confidentiality of our data.” (P1; Appendix F1).

P2 said they use Gmail and Yahoo-mail for sending and receiving electronic mails. They also use Facebook, Instagram and Twitter for advertisements and to communicate with their customers. Furthermore, P2 notes that they use cloud services for their internet banking. Another cloud

application mentioned by P2 is Youtube, which they use for video streaming. P2 also said they use a SaaS application called AdvanceForce for customer relationship management, and another cloud application called Pay Space for payroll and human resources.

> "We are using cloud services like Gmail and Yahoo mail for our emails. We also use Facebook, Skype, Instagram and Twitter for advertisement and communication with customers. We use cloud services for our internet banking as well. Our staff use Youtube for video streaming. They get a lot of training videos on how to use applications and other things from Youtube. For storage, we use Dropbox, Google Drive and SkyDrive. We use AdvanceForce for our customer relationship management. We use a payroll cloud application called Pay Space for our payroll and human resources needs." (P2; Appendix F2).

P3 indicates that they use Gmail for electronic communications and Google Drive for storage. P3 further said they use Facebook and Skype for communication and collaboration. For customer invoicing, P3 said that they use a cloud-based application known as Zuora and they use another cloud application called Gusto for payroll and employee benefits. P3 said "We use Gmail, Facebook, Skype and Google Drive. We also use a cloud service called Zuora for our customer invoicing. We use Gusto for our payroll and employee benefits. It is a cloud-based application." (Appendix F3).

Seventeen of the FSPs currently use cloud applications for general activities such as emails, communication, advertising and storage. They are not currently using any cloud application for their core activities like accounting and payroll as seen with other FSP. When asked whether or not they are currently using any CC applications in their business, P6 initially said no because he is not aware that Gmail and Facebook are also cloud applications. He, however, mentions that they use Gmail and Facebook when asked by the researcher.

Based on the data obtained from the participants, SaaS remains the most popular cloud service model used by the participating FSPs. For communication, Gmail is the common SaaS type among the FSPs that participated in this research. For storage, Google Drive and DropBox are both popular among the participating FSPs. Also, most of the FSPs only use CC for communication and storage because they are not yet using CC for their core business activities. Only five FSPs go beyond using CC for general activities like communication and advertising, using CC for customer relationship management, banking, payroll services, human resources, customer invoicing, expense tracking, reporting and web hosting.

This research found that management issues with CC are a big concern among the FSPs. It has made them reluctant to fully adopt CC for their core business activities -- only five out of the twenty-two participating FSPs use CC for things other than communication and storage. A complete list of all the CC applications used by the participating FSPs is provided in Appendix G.

Finding 60: Gmail and Facebook are the most common tools used for communication by the FSPs. FSPs also use Yahoo mail, Instagram, Skype and Twitter for communication and advertisement.

Finding 61: SaaS is the most common CC service model used by FSPs.

Finding 62: Many FSPs are not using CC for their core business activities. They are only using CC for general business activities like communications.

Finding 63: FSPs use many CC applications in their daily business activities. These applications can be found in Appendix G.

4.5.3 Summary of the findings as linked to the research questions

Table 4.6 shows the research questions and sub research questions linked to the findings of the research (Section 4.4).

Table 4.6: Map of the findings to research questions

Research question 1	
RSQ 1.1	**What are the benefits of CC for FSPs?**
Finding 1	Cost reduction is the main reason why FSPs are adopting CC.
Finding 2	The dependence of CC on the internet is a major problem faced by FSP's in their CC adoption.
Finding 3	FSPs are attracted to CC because of its pay-per-use ability.
Finding 4	The possibility to work from any place at any time is one of the reasons behind FSPs adoption of CC.
Finding 17	The participants have a good understanding of CC; however, the employees struggle with the concept.
Finding 18	CC allows FSPs to maximise the use of their resources.
Finding 20	There is little awareness of the business continuity and disaster recovery plans of the service provider among FSPs.
Finding 21	The ability to introduce new products to the market is of high importance for FSPs.
Finding 22	The high availability of CC is one of the main reasons why FSPs are attracted to CC.
Finding 23	The ability to scale up or scale down depending on business requirements is also an important reason why FSPs are adopting CC.
Finding 24	The ability to reach more customers timeously is among the main reasons why FSPs adopt CC.
Finding 25	CC provides FSPs with automatic updates which saves them time needed for upgrades.

Finding 26	CC saves a lot of time for FSPs and affords them the opportunity to focus on their core business activities.
Finding 27	CC provides S's with the same resources as LEs, thereby allowing them to compete with LEs.
Finding 28	FSPs can focus on their core business activities because the SP's assist them with the installation, upgrades and maintenance of the resources.
Finding 29	CC helps to facilitate collaboration among FSP employees and customers, thereby improving communication among them.
Finding 30	CC contributes to green ICT as it helps to reduce the need for papers.
Finding 31	CC reduces the need for ICT personnel.
Finding 32	CC provides FSPs with access to large volumes of data.
Finding 33	Several employees can access the data at the same time.
Finding 34	The on-demand functionality of CC provides FSPs with more storage capacity.
Finding 35	The low infrastructure requirement of CC makes it easy for FSPs to adopt CC.
Finding 36	CC allows FSPs to be more mobile as employees can work from any place at any time.
RSQ 1.2	**What are the challenges faced by FSPs in their adoption and implementation of CC?**
Finding 6	The lack of awareness of CC causes low usage among FSPs.
Finding 10	FSPs have little confidence in CC because of the security and privacy issues of CC.
Finding 11	Many of the FSPs do not have security measures in place for CC and rely solely on the security measures provided by the SP's.
Finding 38	The security and privacy issues of CC are the main reasons why FSPs are reluctant to use CC for their core business activities.
Finding 41	A good understanding of the legal and jurisdictional issues of CC can assist FSPs in minimising the management challenges of CC.
Finding 42	The internet is expensive for many small FSPs.
Finding 46	Training and development of staff are important for FSPs to boost the confidence of their staff reduce resistance to change by staff.
Finding 52	FSPs are reluctant to use CC for their core business activities because of the possibility of loss of control over data.
Finding 53	The lack of standardization and the possibility of data lock-in makes FSPs reluctant to adopt CC fully.
Finding 54	It is difficult to customise some CC applications, and this demotivates some FSPs who require uniqueness.

Finding 57	Many of the employees in the participating FSPs have little awareness of CC.
Finding 58	Some CC applications have unsolicited advertisements which can negatively affect the productivity of FSPs as it can distract them.
RSQ 1.3	**What management tools do FSPs use when managing the complexities of CC?**
Finding 43	There is a need for FSPs to find a reliable internet service provider (ISP) and to have alternative ISP in case one ISP does not meet their expectation since the internet is an important requirement for CC.
Finding 59	There is a limited number of CC service providers, which leads to limited competition among the SP's and gives the SP's more power over the FSPs.
Finding 60	Gmail and Facebook are the most common tools used for communication by the FSPs. FSPs also use Yahoo mail, Instagram, Skype and Twitter for communication and advertisement.
Finding 61	SaaS is the most common CC service model used by FSPs.
Finding 62	Many FSPs are not using CC for their core business activities.
Finding 63	FSPs use many CC applications in their daily business activities. These applications can be found in Appendix G.
Research question 2	
RSQ 2.1	**How can a set of best practices and governance protocols assist FSPs with challenges faced when using CC?**
Finding 7	There is a need for FSPs to find a credible service provider as it is essential to ensure the safety of their data and to guarantee business continuity and disaster recovery.
Finding 8	A service level agreement (SLA) is an essential document that FSPs need to have when adopting CC as it protects them in case there is a breach by the SP.
Finding 39	Legal and compliance issues and the possibility of data lock-in prevent FSPs from fully adopting CC.
Finding 40	FSPs operate in a highly regulated environment, and as a result, the location of their data is important to them to avoid legal and jurisdictional issues associated with data location.
RSQ 2.2	**How does FSP management combat the challenges faced during the adoption and implementation of CC?**
Finding 5	Awareness of CC is low among FSPs.
Finding 9	The participating FSPs understand the importance of SLA, and most of them have SLAs in place.
Finding 13	The support from top management is essential for successful adoption and implementation of CC.

Finding 16	There is a lack of in-house expertise among the FSPs because many of the small FSPs cannot afford a dedicated ICT expert.
Finding 19	FSPs find CC easy to use, helping to reduce resistance to change.
Finding 37	The pressure from competitors is among the reasons why FSPs adopt CC.
Finding 45	Many FSPs have no training programme in place to equip staff with the needed skills.
Finding 48	There is a need for FSPs to investigate the possibility of integrating their in-house application successfully before adopting CC.
Finding 49	The FSPs have no systematic approach in place because they do not access their level of readiness before adopting CC.
Finding 50	Many FSPs have no CC strategy in place.
Finding 51	The small size of the participating FSPs makes them unable to employ dedicated ICT personnel.
Finding 55	Government support for CC is inadequate, and this reduces the confidence of FSPs on CC.
Finding 56	FSPs are unable to determine the total cost of CC upfront. Thus, they are afraid that they will be unable to plan and budget effectively.

As described earlier (Section 4.4) the findings were analysed to get to the key concepts (Table 4.7)

Table 4.7: The findings linked to the key concepts

Finding number	**Key Concepts**
5; 6; 12; 55	Confidence in CC adoption.
3; 4;18; 22--36	Benefits of CC adoption.
7; 43; 59	CC service provider.
37; 55	Environmental factors of CC.
60	CC service offering used.
62; 63	CC supporting tools.
1; 2; 42; 51; 58	Challenges of CC adoption.
5; 6; 14; 16; 49; 56; 57	Level of CC adoption readiness.
20	Business continuity and disaster recovery.
17	Business value of CC.
39; 40; 41	CC legal issues.

8; 9	Service level agreement.
13	Top management support for CC.
50	CC strategy.
61	SaaS applications used by the participating FSPs.
10; 11; 38	CC security.
19; 52; 62	Organisational factors of CC.
43; 47; 48; 53; 54	Technological factors of CC.
15; 45; 46	CC skills.
17	Understanding of CC concepts.

The four (4) themes that emerged were (a) Readiness management, (b) Management of environment, (c) Management of adoption and (d) Management of Technology. Table 4.8 shows the data analysis process followed in this study. Note that the findings are not shown in this table because of the size of the finding file.

Table 4.8: The key concepts, categories, themes and research sub-questions

Key Concepts	**Categories**	**Themes**	**Research sub-questions**
Confidence in Cloud Computing adoption	Cloud Computing adoption readiness	Readiness management	RSQ 1.1; 1.2; 1.3; 2.1; 2.2
Benefits of Cloud Computing adoption	Skills		
Cloud Computing service provider	Environmental factors of Cloud Computing	Management of environment	RSQ 1.2; 2.1
Environmental factors of Cloud Computing	Organisational factors of Cloud Computing		
Cloud Computing service offering used	Enablers of Cloud Computing adoption	Management of adoption	RSQ 1.1; 1.2
Cloud Computing supporting tools	Inhibitors of Cloud Computing adoption		
Challenges of Cloud Computing adoption	Technological factors of Cloud Computing	Management of technology	RSQ 1.3
Level of Cloud Computing adoption readiness	Applications used by FSP's		
Business continuity and disaster recovery			

Business value of Cloud Computing
Cloud Computing legal issues
Service level agreement
Top management support for Cloud Computing
Cloud Computing strategy
SaaS applications used by the participating FSPs
Cloud Computing security
Organisational factors of Cloud Computing
Technological factors of Cloud Computing
Cloud Computing skills
Understanding of Cloud Computing concepts

4.6 **Summary**

This chapter presented the data analysis and findings. The identified themes were discussed in detail based on the interview data. The themes were derived from the sub-themes, which were linked to the research questions and sub-questions. RSQ1.1 aimed at identifying the enablers (benefits) of CC for FSPs as experienced by the participating FSPs. The findings of the research revealed that FSPs are enjoying the benefits of CC as they were able to mention some benefits of CC that they have experienced in their implementation of CC. Cost reduction was found to be the most attractive benefit to FSPs. Although FSPs know the benefits of CC, their adoption of CC was found to be low with regards to using CC for core business activities. RSQ1.2 sought to uncover the inhibitors (disadvantages) of CC.

This research found that FSPs are aware of the disadvantages of CC and are reluctant to fully adopt CC for their core business activities because of the limitations of CC. The security and management issues they face in their implementation of CC for general business activities is one of the main reasons why their adoption of CC for core business activities has been slow. The high level of sensitivity of the data they handle adds to their reluctance to use CC for core business activities.

RSQ1.3 was intended to identify the management tools used by FSPs in managing the complexities of their day to day business activities. This research found that CC applications for general

productivity are commonly used by FSPs (17) to manage their daily activities. Few (5) of the participating FSPs use CC for core business activities like banking, human resource management and payroll. A complete list of the management tools identified based on RSQ1.2 is available in a tabular format in Appendix G.

RSQ 2.1 was intended to determine how a set of best practices and governance protocols can assist FSPs with the challenges they face when using CC. It was expected that participants would suggest ways by which they can avoid or minimise the problems associated with CC. It was also intended to find out their knowledge of the legal issues of CC in the FSP sector. RSQ 2.1 was also intended to find out the level of top management support available at the participating FSPs for CC to verify the findings from previous literature that lack of top management support is one of the main reasons why SMMEs are not adopting CC. The finding of this research is contrary to previous literature as the participating FSPs do not see top management support as an inhibitor of CC adoption due to the high level of management support they enjoy from their owners.

RSQ2.2 was aimed at understanding the strategies of FSPs in avoiding or minimising the management issues associated with CC implementation. This research found that FSPs do not have any strategy in place to manage their CC implementation. Their lack of CC strategy signifies a lack of readiness management which is evident in their reliance on the service provider for business continuity and disaster recovery (BCDR) and security. This research suggests that in addition to the security and BCDR provided by the service provider, they should develop their in-house CC strategy and have a BCDR plan of their own to avoid costly disappointment from the service provider.

CHAPTER 5

DISCUSSION AND PROPOSED FRAMEWORK

5.1 Introduction

This chapter presents a discussion of the themes developed during data analysis.

The significant investment of traditional systems has led FSPs to look for cost-effective ways to run their businesses. CC proves to be a technology capable of providing FSPs with needed resources without the need for high ICT infrastructure capital investments (Attaran & Woods, 2018). Although CC presents FSPs with many opportunities, this research finds that FSPs are not fully implementing CC due to the management of CC issues such as security and privacy which prevented them from using CC for core business activities. Tambe (2020) reports that security is one of the most challenging hurdles for small businesses that prevented them from adopting CC. Tambe (2020:51) further notes that among the management issues that prevent small businesses from adopting CC are (a) insufficient resources and expertise to implement CC rapidly, (b) lack of implementation time for new initiative considering their limited personnel, (c) management of costs related to maintaining a business on the cloud, and (d) lack of data control on a shared cloud. In agreement with Tambe (2020), this research also found that FSPs lack the time needed to implement new technologies such as CC because of the limited number of employees.

Chapter 5 includes discussions on (a) readiness management, (b) the environment, (c) adoption, and (d) technology. The chapter ends with a summary.

5.2 Discussion of Theme 1: Readiness management

There are six findings relating to the theme "readiness management" (Table 4.5), including the findings associated with the category "level of CC adoption readiness" (Table 4.7). There is a lack of in-house expertise among the FSPs. Many of them cannot afford a dedicated ICT expert to prepare them for the adoption and implementation of CC infrastructure. RSQ 1.2 and RSQ 2.2 (Table 1.1) are both linked to this theme.

5.2.1 RSQ 1.2: What are the challenges faced by FSPs in their adoption and implementation of CC?

Management needs to take care of the lack of expertise by actively managing this challenge. This can be done by outsourcing the ICT-CC function or by recruiting a CC manager. The recruitment of a CC manager is for many FSPs' too expensive, and they will need to be creative and find other ways of using the CC opportunities available to them. The difficulty in integrating CC with in-house systems is one of the barriers to CC adoption (Yeboah-Boateng & Essandoh, 2014). With the outsourcing or appointment of a CC manager, the challenge of integration can be mitigated.

FSPs that adopt CC without a clear understanding of CC and how to minimise the associated issues reduce their level of readiness. A low readiness level is also created by the lack of training programmes to equip staff with the needed skills. Khan and Al-Yasiri (2015:5) found that there is a lack of internal staff expertise (due to lack of in-house CC training) which is preventing CC from transforming SMMEs and state:

> "When asked about the in-house cloud training to overcome this issue; SMMEs said there are no such things in their company. Cloud service providers (CSP's) answered that for most organisations there is no adequate training, no management and front-end support for the cloud which according to CSP's are some serious issues to be addressed in cloud adoption."

This research arrived at a similar finding in that CC training is inadequate in FSPs. The training and development of staff are important for FSPs and should be managed and prioritised to boost the confidence of the FSPs' employees and reduce resistance to change among them.

FSPs often adopt CC without considering their level of readiness. Hence, they are unable to face the challenges of CC adoption and implementation. The poor integration of CC with in-house systems, the lack of CC strategy, the lack of in-house CC training, the lack internal staff expertise, the lack of clear understanding of CC and how to minimise the issues associated with CC speaks to the level of readiness of FSPs towards CC adoption. FSPs are more likely to adopt CC with higher levels of technical readiness (Shetty & Panda, 2020). This research supports Ilyihamije (2019), who argues that the failure or under-utilisation of CC is due to a lack of readiness. It is suggested that FSPs should conduct a thorough readiness assessment of their organisation and take the necessary steps to attain a higher readiness level before adopting CC. Doing so can improve their chances of CC adoption success.

5.2.2 **RSQ 2.2: How does FSPs management combat the challenges faced during the adoption and implementation of CC?**

The FSPs encounter several challenges when using CC. Hence, they need to find ways to combat these challenges and minimise or eradicate the possible effect of these challenges on their business.

Some FSPs have subscribed to alternative internet service providers to address challenges such as poor internet service, and are able to switch over should the current internet service provider perform below expectations Other FSPs, though, simply have to wait for their internet service provider to resolve the issue no matter how long it takes, leading to potentially serious disruptions in the FSPs services to their customers.

To manage these challenges, the FSPs need to have specific CC strategy in place that aligns with the business strategies. Without a CC strategy in place, the level of readiness for the adoption of CC

will be significantly lower. This research found that many FSPs have no CC strategy in place, contributing to a low readiness level.

5.3 Discussion of Theme 2: Management of environment

5.3.1 RSQ 1.2: What are the challenges faced by FSPs in their adoption and implementation of CC?

This theme relates to the environmental and organisational factors, i.e. the constraining and enabling factors from the FSPs' organisational structures and the external environment in which the FSP operates.

In this study, there are ten findings which relate to the theme "management of environment" as listed in the summary of the findings which are linked to the research questions. Table 4.6: Map of the findings to research questions shows the research questions and sub research questions linked to the findings of the research (Section 4.4), including those associated with categories "organisational factors of CC" and "environmental factors of CC". The external environment can be the government, competitors, suppliers, service providers, policymakers and customers (Hassan et al., 2017). These environmental factors can affect the FSPs' ability to adopt and implement CC successfully.

The availability of credible service providers is one challenge that FSPs need to consider before deciding to adopt CC. This research found that there is a limited number of CC service providers, leading to limited competition among the service providers, which in turn gives service providers power over FSPs. Credible service providers are essential to ensure the safety of their data and to guarantee business continuity and disaster recovery. This agrees with the findings of Apostu et al. (2014) and Gharat et al. (2019). Apostu et al. (2014:6) state that "businesses need to make sure that they choose the most reliable service provider, who will keep their information totally secure". Similarly, Gharat et al. (2019:1515) found that organisations should be sensitive to the issue of storing business information on a third-party service provider as it could compromise their company. Gharat et al. (2019) suggest that "it is important to select a reliable service provider that keeps your information secure".

With regards to internet service, which is also an environmental factor, this research found that there is a need for FSPs to find a reliable ISP and to have an alternative ISP as a back-up. Yeboah-Boateng and Essandoh (2014) suggest that internet bandwidth and network infrastructure should be upgraded to address poor internet access and connectivity issues.

Legal and jurisdiction issues are another environmental factor of CC. The literature on CC adoption by SMMEs found legal compliance to be one of the threats to CC adoption (Vasiljeva et al., 2017; Senarathna et al., 2018). Khan and Al-Yasiri (2015) note that two of the issues hurting CC adoption among SMMEs are privacy laws and legal jurisdiction issues. This research found that, although the physical location of data is an important CC environmental factor for FSPs as it relates to legal and jurisdictional issues, the FSPs have little knowledge about these issues. This research suggests that

FSPs manage this lack of knowledge by using vendors, online courses and other means to train and development to their employees, giving them a better understanding of the legal and jurisdictional issues of CC. Doing so will help FSPs to minimise the management challenges of CC.

CC is a form of green computing from the user perspective, and businesses are encouraged to use ecologically friendly and environmentally compliant systems like CC (Yeboah-Boateng & Essandoh, 2014). This research found that CC positively contributes to green ICT from the user end although, this is not necessarily the case at the SP's end.

Government can impact SMME technology adoption by setting up laws and policies which can either enable or discourage the adoption of new technology (Yeboah-Boateng & Essandoh, 2014). Government imposes strict laws around the financial advice that FSPs give to their clients. One of these laws, for instance, requires that all financial advice communications with clients be recorded (e.g. phone calls, printed matter, emails, etc.) and that FSPs have on-demand access to those recordings. This results in FSPs needing massive storage space which would be prohibitively expensive for small FSPs. This research finds that government support for CC is inadequate, resulting in a reluctance on the part of the FSPs to invest in CC. Sakib et al. (2019) suggest that government should take CC privacy concerns seriously by coming up with regulations relating to CC adoption and implementation. They further suggest that government should regulate broadband pricing and provide guidelines for commercial and other suppliers of CC to ensure that unnecessary barriers to CC adoption are reduced. This research agrees with these suggestions as the availability of CC related regulations can increase the confidence of FSPs on the safety of their data. The regulation of broadband pricing by the government can ensure that more FSPs can afford internet services.

5.3.2 **RSQ 2.1: How can a set of best practices and governance protocols assist FSPs with challenges faced when using CC?**

Research question 2.1 asks "How can a set of best practices and governance protocols assist FSPs with challenges faced when using CC?", aims at assisting FSPs to devise a strategy to overcome the challenges they face when managing, adopting and using CC. Having a good understanding of CC is a good starting point for FSPs in their quest to find best practices and governance protocols that can help them overcome the challenges of CC adoption and implementation. Service level agreements (SLAs) between the FSPs and their service providers is another step towards FSPs' realisation of best practices and governance protocols in overcoming CC challenges. Sarmah (2020) notes that SLAs are often not specific or detailed enough and are, therefore, one of the limitations of CC. For example, service providers often advertise the level of availability of the services they offer, but some of them refuse to include it in the SLA (Sarmah, 2019). This research suggests that FSPs should negotiate SLAs before signing up with a service provider to ensure they address all concerns.

Both organisational and environmental factors influence the adoption and implementation of CC. FSPs should ensure that organisational and environmental factors are favourable before attempting

to adopt and implement of CC. FSPs should conduct a proper investigation into how the organisational and environmental factors can affect this adoption *before* adoption. The proposed framework - FSPCLOUD (Figure 5-1) - can assist FSPs in this regard.

The management issues of CC include the organisational factors of CC such as top management support, availability of CC skills, availability of training programmes, availability of CC supporting tools and firm size. The organisational factors affect the adoption and implementation of CC. In this study, six findings are related to theme two (Management of the environment) (Table 4.4). These include the findings associated with the categories, namely (a) organisational factors of CC, (b) understanding of CC concepts, (c) level of CC adoption readiness, and (d) inhibitors of CC adoption.

Top management support is one of the primary factors influencing CC adoption decisions (Abubakar et al., 2014; Yeboah-Boateng & Essandoh, 2014; Tambe, 2020). This research also found that the support from top management is important for successful adoption and implementation of CC. Top management needs to actively involved during the readiness assessment, adoption and implementation of CC in the FSP.

SMMEs often lack ICT skills and knowledge, and this is one of the main barriers of CC adoption (Yeboah-Boateng & Essandoh, 2014). This research found that there is a need to improve the knowledge and skills of FSPs on CC. In addition, this research found that many FSPs have no training programme in place to equip staff with the needed skills. RSQs 1.2 and 2.1 link to the theme "management of the environment". RSQ 2.1 led to the development of the proposed framework FSPCLOUD (Figure 5-1).

Management issues start long before the adoption process commence. Management needs to have ICT strategies in place that accommodates CC and in particular the business readiness for the adoption of ICT and in this case, CC. It is at this point where strong management is required as management confronts the business change potential and all the factors that cover readiness for the adoption of CC (Ilyihamije, 2019).

5.4 Discussion of Theme 3: Management of adoption

The adoption of CC by FSPs depends on various factors such: as the understanding of CC within the FSPs; government support for CC and skills of the FSPs, and; their awareness of the benefits and disadvantages of CC. This study finds that, according to the participants, only a few employees have a good understanding of CC and are also aware of the benefits and disadvantages of CC and its impact on the organisation. In this study, there are forty-four findings that relate to theme 3 (Management of adoption) (Table 4.4). These include the findings associated with the key concepts of (a) understanding of CC concepts, (b) enablers of CC adoption, (c) inhibitors of CC adoption, and (d) confidence in CC adoption. The number of findings relating to theme 3 is the highest in the analysis, showing that adoption (theme 3) is a significant issue for FSPs. It suggests that FSPs could

boost their chances of achieving success in their adoption of CC if they improve their ability to understand the concepts, benefits and disadvantages of CC, and improve their confidence in CC.

Theme 3 involves RSQ 1,1; RSQ 1.2 and RSQ 2.2, which are discussed in sections 5.4.1, 5.4.2 and 5.4.3. respectively.

5.4.1 **RSQ 1.1: What are the benefits of CC for FSPs?**

This research selected participants who are knowledgeable about CC. The possibility of finding participants with CC knowledge among FSPs confirms the findings of Vasiljeva et al. (2017) in which the familiarity of 86 SMMEs with CC and the impact of CC adoption on business performance have been evaluated. They reported that 98% of SMMEs are aware of CC and that this awareness influenced their decision to adopt CC.

The benefits of CC according to the participants include (a) cost reduction, (b) usage-based billing, (c) ease of use, (d) business continuity, (e) ability to introduce new products to the market timeously, (f) and availability, reliability, elasticity, flexibility, and scalability of systems.

The advantages identified by the participants in section 2.2 support the findings Bajenaru, (2010), Zabalza et al. (2012), Wang (2013), Yeboah-Boateng and Essandoh (2014), Ming et al. (2018), and Shetty and Panda (2020). The latter also identified benefits such as usage-based billing, low cost, scalability, portability, reduced software and hardware obsolescence, greater accessibility to the latest ICTs, automatic updates and upgrades, flexibility, time savings, improved disaster recovery and back-up capabilities and easy deployment process. As the benefits of CC have a positive impact on CC adoption, the FSPs need to have a good understanding and awareness of the benefits of CC.

Although many FSPs are aware of the benefits of CC, they have not necessarily fully adopted CC due to the disadvantages of CC. In summary, the benefits of CC identified by the participants are:

- cost reduction,
- usage-based billing,
- ease of use,
- business continuity,
- ability to introduce new products to the market in a timely manner,
- availability and reliability,
- elasticity, flexibility/scalability,
- ability to reach more customers,
- automatic updates,
- levels the playing ground,
- no installation, maintenance or upgrades by the users,
- improved communication and collaboration,
- eco-friendly ICT,

- reduced ICT support,
- improved access to data and more storage capacity,
- low infrastructure requirement,
- improved mobility and
- improved performance due to competitive pressure.

5.4.2 **RSQ 1.2: What are the challenges faced by FSPs in their adoption and implementation of CC?**

RSQ 1.2 addresses the challenges faced by FSPs when adopting and implementing CC. This research finds that the FSPs are aware of the disadvantages of CC, and this has negatively impacted their adoption decision as they are afraid of using CC for their business activities. As stated in section 4.5, FSPs are using CC to some extent (e.g. emails and Whatsapp) for general business activities but do not do so for their core business process activities. One such core business activity is the giving of financial advice to clients. A second core business activity is the interaction with large service providers (primarily large financial institutions) that develop products for FSPs and their clients, and who also underwrite the financial offerings of FSPs. Since the financial health of their clients, and the advice given to them, are the lifeblood of FSPs, the FSPs keep strict control over information to prevent it from getting to third parties whom they do not trust. Furthermore, FSPs are obliged by law to keep all financial advice to clients on record be it, written, telephone, or one of the many electronic means available to them. Since the COVID19 lockdown regime began in March 2020, various platforms such as ZOOM, WeChat and Microsoft Teams have become popular to conduct business meetings, and these meetings must now also be recorded. The recordings must also be readily available, for example, if a client has a complaint or a compliance audit is required.

The disadvantages of CC identified here are in agreement with existing literature, e.g. Akande et al. (2013), Yeboah-Boateng and Essandoh (2014), Bajdor and Lis (2014), Kreslins et al. (2018) and Al Isma'ili et al. (2020) (section 2.2). These authors report that among the disadvantages of CC, which prevents SE's from fully adopting CC are:

- privacy and security issues,
- the lack of awareness of the benefits and limitations of CC,
- the lack of necessary ICT skills,
- the reliance of CC on the internet,
- service migration,
- legislation and compliance,
- compatibility,
- performance and downtime,
- availability,
- cost of bandwidth, and

- interoperability issues.

The participants in this research mention security and privacy issues, data location, legal or jurisdiction issues, dependence on the internet and insufficient knowledge or skills of employees about CC as some of the disadvantages of CC.

The disadvantages of CC prevent FSPs from fully implementing it. Before adopting and implementing CC, small businesses should be aware of the disadvantages and consider how they can affect their businesses (Apostu et al., 2014). FSPs should do a risk analysis and then plan to mitigate the risks. An understanding of the benefits and disadvantages of CC is essential for successful implementation of CC (Chong, 2019). In summary, the disadvantages of CC mentioned by the participants are:

- Security and privacy issues,
- Data location, legal or jurisdiction issues,
- Dependence on the internet,
- Insufficient knowledge or skills about Cloud Computing,
- Migration and integration Issues,
- Lack of readiness for CC,
- Firm size (i.e. the small size of SE's prevents them from being able to afford dedicated ICT personnel for their CC initiatives),
- Loss of control over data,
- Lack of standardisation, customisation and the possibility of data lock-in,
- Lack of adequate government support,
- Inability to determine the total cost upfront,
- Lack of awareness among staff,
- Unsolicited advertisements, and
- Insufficient service providers.

5.4.3 **RSQ 2.1: How can a set of best practices and governance protocols assist FSPs with challenges faced when using CC?**

This question explores the strategies employed by FSP management in reducing or eradicating the challenges they face when adopting and implementing CC. The availability of a CC strategy can assist FSPs to implement CC successfully. This research has found that many FSPs have no CC strategy in place, and they adopt CC without having a clear understanding of how to minimise the issues associated with CC. Attaran and Woods (2018:10) note that "many companies have failed with the deployment of cloud computing because of the failure of developing a cloud strategy rooted in the delivery of ICT services which are linked to business process outcomes." This research suggests that FSPs should develop a CC strategy to assist them in managing the issues and complexities of CC and to help avoid implementation failure.

CC can assist FSPs with business continuity planning by protecting data and ICT systems. CC service providers ensure the back-up and protection of mission-critical data in a secure and safe location using advanced strategies (Attaran & Woods, 2018). Ten participants confirm that their service providers offer them BCDR, but that they have no detailed knowledge of those BCDR plans. This research finds that FSPs have little awareness of the BCDR plans of their cloud service provider The provision of BCDR by the service providers has led FSPs to show low interest in having their own in-house plans. Although the service providers offer organisations BCDR, this research suggests that FSPs should have their own in-house BCDR plans to avoid any disappointments from the service provider. FSPs can combat the challenges they face during the adoption and implementation of CC by:

- addressing management issues that come with CC adoption,
- developing a BCDR plan in-house,
- developing a CC strategic plan, and
- acquiring the appropriate supporting technologies, i.e. quality internet services for CC.

5.5 Discussion of Theme 4: Management of technology

The technological factors can influence the adoption decisions of FSPs. For example, the availability of necessary CC supporting tools can encourage them to adopt CC while the non-availability of such tools can hinder their CC adoption.

5.5.1 RSQ 1.3: What management tools do FSPs use when managing the complexities of CC?

RSQ 1.3 explores the technological factors of CC by identifying the tools that FSPs are using to during their daily business activities.

In this study, there are sixteen findings which relate to theme four (Management of technology) as listed in the summary of the findings which are linked to the research questions. Table 4.6: Map of the findings to research questions shows the research questions and sub research questions linked to the findings of the research (Section 4.4). These include the findings associated with the categories; (a) SaaS applications used by FSPs, (b) IaaS applications used by FSP's and (c) technological factors of CC.

Having the right tools to aid the adoption and implementation of CC can assist FSPs in adopting and implementing CC successfully. FSPs generally have the necessary infrastructure for CC due to the low infrastructure requirements of CC. The low infrastructure requirements of CC leads to reduced infrastructure cost (Gharat et al., 2019). The tools currently employed by FSPs are used mostly for general business activities; the tools available for core business activities are not being implemented. Table 5.1 provides a summary of the software packages and their use within the FSPs. Table 5.2 itemises the most common advantages and disadvantages of CC software from the FSPs' perspective.

Table 5.1: CC tools used by the FSPs

Software	Function of Tool
AdvanceForce	Customer relationship management
Dropbox	Storage
Facebook	Advertisement, networking, communication and collaboration
Gmail	Communication and collaboration
Google drive	Storage
Instagram	Advertisement, communication and collaboration
Kineto	Used for electronic banking, electronic accounts management and electronic payments
Linkedin	Communication, professional networking and Recruitment
MS Office 365	Office productivity, communication and collaboration
Pay Space	Payroll and human resources
PointClick	Data storage
Skydrive	Storage
SMEasy	Online Business Management and Accounting System. Used for pricelist, invoice and quote generation.
Twitter	Advertisement, communication and collaboration
Yahoomail	Communication and collaboration

Table 5.2: Some generic advantages and disadvantages of CC packages used by FSPs

Advantages	Disadvantages
No installation, maintenance or upgrades by the users	Inability to determine the total cost upfront
Green ICT	Unsolicited advertisements
Ability to reach more customers	Loss of control over data
Business continuity	Insufficient knowledge or skills about Cloud Computing
Reduced ICT support	Insufficient service providers
Automatic updates	Lack of standardisation, customisation and the possibility of data lock-in
Usage-based billing	Data location, legal or jurisdiction issues

Ease of use	Dependence on the internet
Ability to introduce new products to the market in a timely manner	Migration and Integration Issues
Improved communication and collaboration	Lack of awareness among staff
Availability and reliability	Lack of readiness for CC
Improved access to data and more storage capacity	
Cost reduction	Security and privacy issues
Cloud Computing leverages the playing ground	Lack of adequate government support
Elasticity, flexibility/scalability	Firm size

5.5.2 Research sub-question 2.2: How does FSPs management combat the challenges faced during the adoption and implementation of CC?

This question relates to the theme "management of technology" as it explores how FSPs can manage to reduce or eradicate the challenges they face when adopting and implementing CC. This research finds that the lack of in-house BCDR and other strategic plans by FSPs affects their ability to combat the challenges faced when adopting and implementing CC. As previously suggested in section 5.4, FSPs should (a) develop their own BCDR plan, (b) develop CC strategic plans, and (c) acquire the needed CC supporting technologies as this can assist them in combating the challenges associated with faced CC adoption and implementation.

FSPs should evaluate their CC readiness level before adoption. One of the main challenges faced by FSPs during CC adoption and implementation is the lack of ability to determine their level of CC readiness before adoption (Ilyihamije, 2018). Financial issues, lack of management skills and ICT resources are also among the challenges faced by FSPs during the adoption and implementation of CC (Kreslins et al., 2018). The lack of training facilities of FSPs to provide the owners and staff members with management skills needed to drive their CC initiatives also affects FSPs ability to combat the challenges faced during the adoption and implementation of CC (Gamage, 2019). Proper budgeting for CC requirements should be considered by FSPs to ensure that necessary ICT resources for CC implementation are available. Training should also be arranged for FSP owners and staff members to equip them with the required management skills.

To summarise, FSPs need to aspire to attain a higher readiness level before adoption and implementation of CC. To achieve this, they should (a) develop their own BCDR plan, (b) develop CC strategic plans, (c) acquire the needed CC supporting technologies, (d) provide CC related training and development for owners and staff alike, and (e) make provisions for funding of CC related resources.

5.6 The proposed framework

From the results and discussion, an integrated framework - "FSPCLOUD" - has been developed to assist FSPs with their CC adoption and implementation. Central to the proposed framework is Technology, Organisation and Environment, reflecting the theory on which this research is based.

The proposed framework provides guidelines for FSPs regarding the essential steps they need to take before and after the adoption of CC. A prototype version of the framework was presented to the participants to confirm the relevance and applicability of the proposed framework. After getting feedback from the participants, a revised version was produced in line with their suggestions (Figure 5-1).

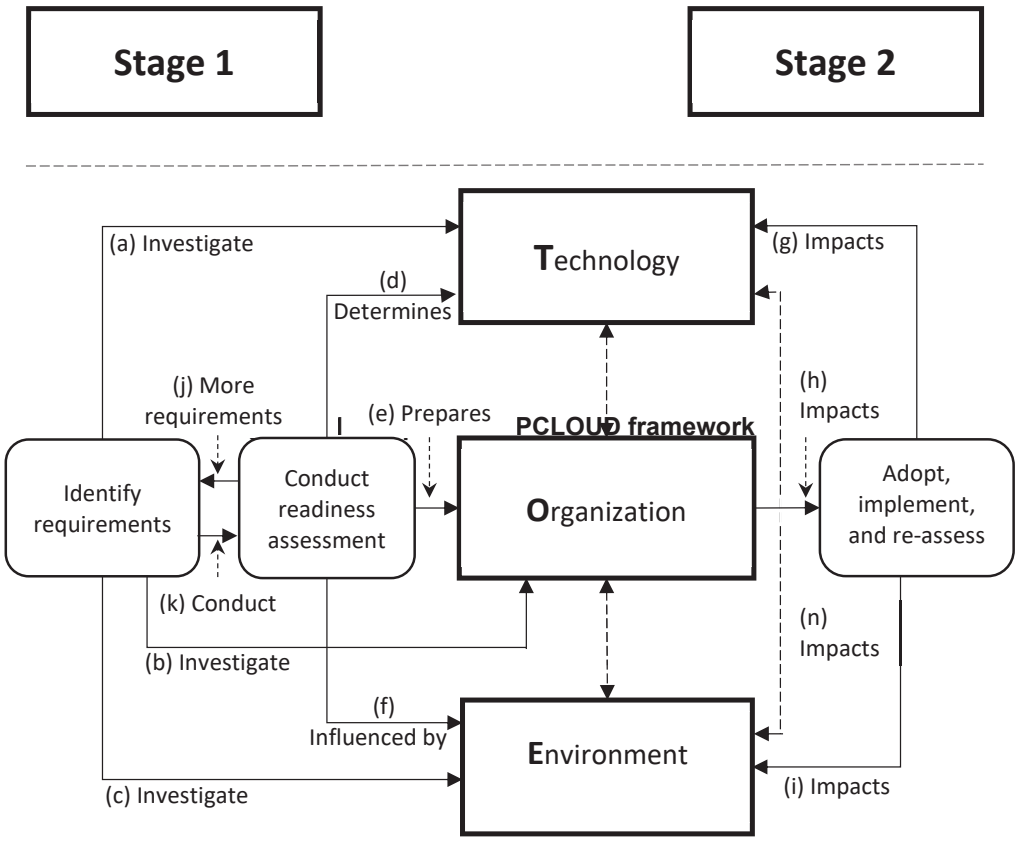

Figure 5-1 The proposed FSPCLOUD framework

The design of the framework started with the researcher identifying, from both literature and the thematic analysis, the problems that the framework needs to address. FSPs face management issues before, during and after adoption of CC. For example, before adoption, FSPs are unable to identify their business requirements and map them to the relevant CC application. During adoption, FSPs lack the necessary skills needed to implement CC successfully. They also face issues such as employee's resistance to change by CC. After adoption, FSPs have no evaluation programmes in place to determine whether the CC applications meet their business needs. FSPs are unable to

identify these management issues and are therefore unable to come up with viable solutions to these issues.

5.6.1 **Before adoption – stage 1**

Stage 1 of FSPCLOUD caters for what FSPs need to do before adopting CC. The first step is to identify how CC can be utilised in their business. After this identification process, FSPs should research cloud offerings that offer the functionalities required and select one of the available offerings. The technical requirements for each cloud offering should be identified in order to ensure that the organisation meets all the basic requirements of the cloud offering.

While identifying their requirements, the FSP should investigate the technology (a), i.e. the cloud offering and, the organisation (b), i.e. they should investigate whether there are staff with required skills to use the cloud offering and whether the organisation has the necessary ICT infrastructure. They should also investigate their environment (c) to determine if there are resources such as bandwidth to support their cloud infrastructure.

The next step will be to conduct a readiness assessment (k) to ensure that the organisation can meet all the requirements identified in the first step. If they find themselves not ready to proceed, they should return to the requirement gathering step, as shown by (j). The FSP should only proceed with adoption once all the requirements have been met, and the readiness assessment has been passed.

The outcome of the readiness assessment (d) will influence what cloud offering the FSP will adopt, as different cloud offerings have different infrastructural requirements. The readiness assessment will prepare the FSP itself for successful CC adoption and implementation (e). At the same time, the outcome of the readiness assessment will also be influenced by the environment (f). This is because some environments may not have the necessary resources to support CC. In cases where basic infrastructure like bandwidth is available, the readiness level of FSPs can be improved. The cost of bandwidth may vary from one environment to another, and this may influence the FSPs ability to afford the bandwidth to support CC.

The relationships between the technological, organisational and environmental factors should also be identified as they can affect each other as shown by arrows (l), (m) and (n). For example, the lack of a CC supporting technology can affect an organisations readiness level to adopt CC. This is a crucial stage as the outcome will impact the final adoption and implementation of CC, as illustrated by arrows (g), (h) and (i). Hence, a detailed and comprehensive evaluation of all the technological, organisational and environmental factors should be conducted.

5.6.2 **After adoption – stage 2**

Continuous evaluation of the chosen CC application should be conducted to give room for improvements. A review should be carried out after each evaluation to ensure the resolution of the

errors and issues identified during the evaluation. The evaluation and review should be a continuous exercise as this can allow the FSP to pick up management issues with the cloud offerings even after updates by the service provider and allow them to find solutions to those issues timeously.

5.7 Research questions revisited

The four themes that emerged have been discussed based on their links to the RSQs. Some RSQs are linked to more than one theme, while others are linked to only one theme.

RSQ 1.1 aims to identify the benefits of CC as experienced by the FSPs. The research shows that FSPs understand CC concepts, and in some cases, have enjoyed the benefits of CC.

RSQ 1.2 aims to identify the disadvantages of CC for FSPs. The research shows that FSPs are aware of the disadvantages of CC and are reluctant to commit to CC because of this.

RSQ 1.3 aims to identify the tools used by FSPs in managing the complexities of CC adoption and implementation. This research found that FSPs are mainly using CC tools associated with general business activities and are only using a few CC tools for core business activities.

RSQ 2.1 explores the possibility of having a set of best practices and governance protocols to assist FSPs with challenges faced when using CC. A framework - FSPCLOUD (Figure 5-1) - is proposed, which is expected to guide FSPs in the adoption and implementation of CC.

RSQ 2.2 explores how FSPs management combats the challenges faced during the adoption and implementation of CC. Although the participating FSPs have general ICT strategies in place, this research found that FSPs do not have any specific CC strategy and rely mainly on the service providers for their CC strategies, including BCDR plans.

This research suggests that FSPs should consider using the proposed framework (FSPCLOUD) as a guideline to take them through their CC adoption and implementation process. By doing so, this research hopes that the proposed framework (FSPCLOUD) can assist FSPs in their adoption and implementation of CC and increase their chances of having a successful adoption.

The next and final chapter is dedicated to the conclusions drawn from study results, recommendations, research contributions and self-reflection.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter presents the answers to the research questions shown in Table 1.1 and provides a discussion of the aims and objectives of this research. The research recommendations, contributions as well as self-reflections are also included in this chapter.

Researchers in both academics and industry have conducted various studies on CC. The majority of these studies focus on the adoption and advantages of CC, while others focus on the disadvantages or limitations of CC. Many studies also focus on CC in large organisations, with only a few studies reporting on CC from the perspective of SE's. The low number of studies on the limitations of CC and the management of CC in SE's show that there is a gap in the literature and this research attempts to assist in closing this gap.

6.2 Addressing the aims and objectives of this research

The results of this research have addressed the aims and objectives of this research. This research aimed to explore the factors affecting the management of CC in FSPs. The objectives of this research were to identify the management issues and limitations that FSPs face when adopting and implementing CC. This research also aimed to propose a framework that FSPs can use in managing the adoption and implementation of CC.

There are many management issues and limitations faced by FSPs in their adoption and implementation of CC. This research has revealed four important themes (areas of management) which are: readiness management, management of the environment, management of adoption, and management of technology.

With readiness management, this research reveals that FSPs lack in-house expertise because they cannot afford a dedicated ICT expert to prepare them for the adoption of CC. The research also shows that FSPs fail to assess the CC readiness level before adopting CC. The lack of CC readiness of FSPs affects their ability to implement CC successfully. Furthermore, it shows that there is a lack of awareness of both the benefits and limitations of CC among FSPs, which in turn contributes to the FSPs lack of trust in CC which is evident in their reluctance to adopt CC for their core business activities.

The FSPs lack of CC training and strategic plans are shown in this research. The importance of providing CC related training for employees and coming up with CC strategic plans has been emphasised in this research.

The ability of FSPs to successfully adopt CC is influenced by environmental and organisational factors from within and externally by the FSP, government, competitors, suppliers, service providers,

policymakers and customers. With the management of the external environment, many FSPs do not entirely trust the service provider regarding the safety of their data; hence, the importance of selecting a credible service provider to guarantee the safety of data and ensure business continuity and disaster recovery. Government support is inadequate for CC initiatives. This research also finds that poor internet services and connectivity issues are serious management issues relating to the management of the environment. This research also finds that the location of data may lead to legal and jurisdictional issues.

The management of adoption is another theme revealed by this research. This research found that only a few of the employees in the participating FSPs have a good understanding of CC. Most FSP employees do not know about the benefits and disadvantages of CC and the impact these have on the organisation. This research found that FSPs are reluctant to fully adopt CC for their core business activities due to the limitations of CC.

The management of technology forms part of the themes identified by this research. The lack of ICT resources is one of the challenges faced by FSPs during CC adoption and implementation. To successfully adopt CC, FSPs need to have the right ICT resources (technologies) needed to support CC.

The proposed framework (FSPCLOUD) has been developed to assist FSPs in their adoption and implementation of CC. FSPCLOUD provides a 3-stage approach for FSPs to manage their CC adoption implementation and continued use right from before adoption to the adoption and then to after adoption. It is proposed that the steps suggested in FSPCLOUD can serve as a set of best practices and governance protocols which can assist FSPs in overcoming the challenges FSPs face when using CC. It is anticipated that FSPCLOUD can assist FSPs to successfully prepare for adoption and manage the adoption and implementation process.

6.3 **Conclusions**

The use of CC by FSPs offers them the opportunity to be and remain competitive and may lead to the growth and expansion of their business. Some FSPs are realising the potential of CC for their businesses; many are unaware of the limitations and how to manage them. Thus, they are reluctant to adopt CC. The lack of understanding has prevented many FSPs from realising the expected benefits of CC. This research has uncovered the dynamics and complexities associated and the limitations with CC in FSPs. The benefits and limitations of CC are identified by this research to assist in promoting awareness among FSPs.

6.4 Recommendations

There are currently no adequate provisions for CC related training by FSPs, and it is recommended that FSPs provide training for their employees on how to use CC effectively to improve employee productivity. This would also help to reduce employee resistance. The selection of a reputable service provider is important for a successful CC implementation. This research recommends that FSPs develop appropriate strategies to guide them in selecting the right service provider.

To overcome the problem of internet connectivity, this research recommends that the government can help regulate internet service providers to ensure that their prices are reasonable and affordable for FSPs. This would encourage more FSPs to consider CC as the high cost of internet services was found to be one of the reasons why many FSPs are reluctant to adopt CC. Further recommendations are:

- The service providers need to improve the security of data stored on the cloud, and this should be clearly stated in the SLA. If this is done, FSPs would be more motivated to adopt CC.

- To improve the chances of a successful CC adoption and implementation, FSPs should assess their CC readiness level and ensure they attain a higher CC readiness level before adoption.

- Management needs to outsource the ICT-CC function or recruit a CC manager to avoid issues which may arise as a result of lack of in-house expertise,

- This research recommends that FSPs need to find a reliable ISP and to have an alternative ISP as a back-up to overcome the poor internet services and connectivity problems,

- There is a need for more support from the government in terms of setting up laws and policies that can guide the CC adoption and implementation process.

- A good understanding of the advantages and disadvantages of CC before adoption is necessary for FSPs as it can equip them in making an informed decision regarding their CC adoption. Before adopting CC, FSPs should also conduct a risk analysis and develop plans to mitigate the risks.

- To ensure that necessary ICT resources for CC implementation are available, FSPs should make budgets for CC requirements.

- Finally, it is recommended that FSPs should employ the use of the proposed framework (FSPCLOUD) as it can assist by preparing them for a successful adoption implementation and continued use of CC.

6.5 Research Contributions

6.5.1 Theoretical Contributions

This research attempts to make a theoretical contribution by enhancing the understanding of how CC can be managed effectively in FSPs to improve productivity and create opportunities for growth and expansion. This study also made a theoretical contribution by questioning and validating the assumptions of previous studies on CC in FSPs. The proposed framework (FSPCLOUD) is another important theoretical contribution of this research aimed at guiding FSPs towards a successful adoption and implementation of CC.

6.5.2 Practical Contributions

This research contributes to practice by creating awareness of the benefits and limitations of CC for FSPs. The proposed framework referred to as “FSPCLOUD” framework serves as a form of practical contribution and is intended to serve as a tool by which FSPs can learn about the important aspects of CC to ensure implementation success. The framework can assist owners of FSPs, their ICT managers, and other decision-makers in FSPs in making informed decisions about CC and drive their organisation towards a successful CC adoption and implementation.

6.6 Self-Reflections

This research is based on the data obtained from the participants from the twenty-two selected FSPs. There were several challenges encountered during this research. Of importance is the difficulty faced to secure interviews with some of the participants. Some interviews were rescheduled twice or more because of the busy schedules of the participants, some of whom, had to cancel and reschedule the interviews at the last minute. The difficulty faced in getting hold of the participants delayed the projects, and the project timeline was shifted on several occasions. The research findings showed some CC management issues that need the attention of FSPs to assist them in overcoming those issues. For example, the lack of training and development programmes in the FSPs requires the attention of FSPs as the availability of training can improve the confidence of FSPs in CC and increase their chances of a successful CC adoption. This research suggests that FSPs should come up with a CC strategy and conduct readiness assessment before adopting CC. This will prepare them against all the management issues of CC that they may encounter during and after adoption.

There is a need to find out why FSPs are not using IaaS and PaaS. Future research can investigate the impact the identified management issues are having on FSP. Also, future research can focus on how IaaS and PaaS can be used by FSPs to improve their business activities. Future research can also investigate why a similar study conducted in Australia arrived at a different conclusion from this

study and other studies from Germany and Malaysia with regards to the effect of competitive pressure on FSPs CC adoption decisions.

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APPENDICES

8.1 Appendix A1: Ethics form

Cape Peninsula University of Technology

FACULTY OF BUSINESS
ETHICAL CONSIDERATIONS FOR A QUESTIONNAIRE
CAPE PENINSULA UNIVERSITY OF TECHNOLOGY

Tick One Box: □ Staff Project
□ Postgraduate Project (Masters and Doctoral level)
□ Undergraduate Project (ND & BTech level)

Title of Project: Management Issues with Cloud Computing: A Small and Medium Enterprises perspective using TOE framework

Name of researcher(s): Nozuko Aurelia April
Name of Supervisor(s) (if appropriate): Dr Andre de la Harpe

		YES	NO	N/A
1	Will you describe the main experimental procedures to participants in advance, so that they are informed about what to expect?	YES		
2.	Will you tell participants that their participation is voluntary?	YES		
3.	Will you obtain written consent for participation?	YES		
4.	If the research is observational, will you ask participants for their consent to being observed?	YES		
5.	Will you tell participants that they may withdraw from the research at any time and for any reason?	YES		
6.	With questionnaires will you give participants the option of omitting questions they do not want to answer?	YES		
7.	Will you tell participants that their data will be treated with full confidentiality and that, if published, it will not be identifiable as theirs?	YES		
8.	Will you debrief participants at the end of their participation (i.e. give them a brief explanation of the study)?	YES		

If you have ticked No to any of Q1-8, you must ensure that the reasons for this are made explicit in your project proposal. [Note N/A = Not applicable].

		YES	NO	N/A
9.	Will your project involve deliberately misleading participants in any way?		NO	
10.	Is there any realistic risk of participants or researchers experiencing either physical or psychological distress or discomfort? If yes, give details on a separate sheet and state what you will tell them to do if they should experience any problems (e.g. who they can contact for help).		NO	

If you have ticked Yes to Q9 or Q10 you should ensure that your proposal describes in sufficient detail the appropriate procedures and provides a scientific justification for their inclusion. You should also identify alternative methodologies and outline the reasons why they were deemed inappropriate.

			YES	NO	N/A
11.	Does your project involve work with animals**? If yes, you should also investigate whether you require approval from the S.A. Health Professions Council and/or related organisation? Provide the answer to this in your proposal**			NO	
12.	Do participants fall into any of the following groups**? If they do, refer to professional body guidelines and include some reference to these in your proposal.**	Children (under 16 years of age)		NO	
		Schoolchildren of all ages.		NO	
		People with learning or communication difficulties		NO	
		Patients		NO	
		People in Custody		NO	
		People engaged in illegal activities (e.g. drug taking)		NO	

		YES	NO
13.	Does your study include administering a Psychometric test(s)? **If yes, name the test (s) and describe your or your supervisor's competence to administer such tests.**		NO
		YES	NO
14.	Will your study involve *any* contact with *any* external institution**? If yes, your proposal will not normally be approved unless you submit a letter of confirmation from the person responsible for this institution that they are happy for you to conduct your study on their premises and/or contact their staff and/or people who use the service.**		NO

There is an obligation on the lead researcher to bring to the attention of the Faculty of Business Ethics Committee any issues with ethical implications not clearly covered by the above checklist.

PLEASE TICK **EITHER** Statement **A** OR Statement **B** BELOW **AND PROVIDE THE DETAILS REQUIRED** IN SUPPORT OF YOUR APPLICATION. THEN PRINT OFF AND SIGN THE FORM

Please Tick

Statement A: I consider that this project has **NO** significant ethical implications to be brought before the Faculty of Business Ethics Committee.	

Please Tick

Statement B: I consider that this project may have ethical implications that should be brought before the Faculty of Business Ethics Committee, and/or it will be carried out with children or other vulnerable populations. **If you select this Statement, please ensure that you outline clearly the ethical issues in your proposal.**	

If you ticked Statement B then please provide all the further information listed below in a separate attachment.

1. Your Name
2. Title of project
3. Purpose of project and its academic rationale.
4. **Full** description of methods and measurements
5. Participants: recruitment methods, number, age, exclusion/inclusion criteria
6. Consent and participant information arrangements, debriefing. **Please attach intended information and consent forms.**
7. A clear but concise statement of the ethical considerations raised by the project and how you intend to deal with them.
8. Estimated start date and duration of project.

This form (and any attachments) should be submitted to the Faculty of Business Ethics Committee where it will be considered. **If any of the above information is missing, your application will be returned to you.**

I (student and/or supervisor) am familiar with the ethical practices in research.
I am familiar with the Cape Peninsula University of Technology Guide to Post Graduate Studies and Guidelines for Research Proposals.

Signed ……..
Print Name: Nozuko Aurelia April
Student Number: 217289339
Date: ……
(Undergraduate/Postgraduate researcher(s)/student)

Signed ……..
Print Name: Dr Andre de la Harpe
Date……
(Lead Researcher or Supervisor)

8.2 Appendix A2: Ethics clearance certificate

P.O. Box 1906 • Bellville 7535 South Africa •Tel: +27 21 4603291 • Email: fbmsethics@cput.ac.za
Symphony Road Bellville 7535

Office of the Chairperson Research Ethics Committee	Faculty: BUSINESS AND MANAGEMENT SCIENCES

At a meeting of the Faculty's Research Ethics Committee on **30 April 2019**, Ethics **Approval** was granted to **Nozuko Aurelia April (217289339)** for research activities of **M Tech: Business Administration** at Cape Peninsula University of Technology.

Title of dissertation/thesis/project:	MANAGEMENT ISSUES WITH CLOUD COMPUTING: SMALL, MICRO AND MEDIUM ENTERPRISES PERSPECTIVE USING THE TECHNOLOGY, ORGANISATION AND ENVIRONMENT FRAMEWORK Lead Researcher/Supervisor: Dr A de la Harpe

Comments:

Decision: Approved

	10 May 2019
Signed: Chairperson: Research Ethics Committee	Date

Clearance Certificate No | FOBREC649

Cover Letter for Participation of selected owners of Small and Medium Enterprises in Interview

Department of Business Administration

Cape Peninsula University of Technology

Tel: +27 21 460 4251

Fax No: +27 21 460 3716

REQUEST TO PARTICIPATE IN A RESEARCH INTERVIEW

Dear Participant,

I am currently pursuing my master's degree in Business Administration at Cape Peninsula University of Technology. As part of the requirements for the completion of my master's degree in business administration, I am conducting a research on "Management Issues with Cloud Computing: A Small, Micro and Medium Enterprises perspective using TOE framework". Cloud Computing offers a lot of benefits to organisations and has the capability to provide them with access to resources such as infrastructure, software and platforms to develop their own software and applications. Regardless of the numerous benefits it offers, some small and medium enterprises struggle to enjoy these benefits due to reasons such as lack of knowledge about Cloud Computing and lack of necessary skills.

This interview will contribute towards identifying the issues and problems faced by small and medium enterprises and how to overcome them. This interview will also contribute towards the development of a framework aimed at assisting small and medium enterprises in their adoption and implementation of SaaS to assist them in reaping the expected benefits of Cloud Computing. The outcome of this research will benefit your organisation as the framework can provide a better understanding of Cloud Computing, the issues related with Cloud Computing and how to avoid these issues for a successful implementation of Cloud Computing. The interview will be conducted face to face and would take between 45 and 90 minutes.

The researcher will ensure that the data obtained during the interview is only used for this research and kept confidential. The identity of the participants and their organisations will also be kept confidential. Information about the participants and their organisations will also

be kept confidential. This research does not pose any risk to the participants and their organisations.

I would like to inform you that your participation in this research is voluntary. The interview questions have been approved by CPUT's faculty of business and management sciences ethics in research committee. The researcher would provide you with a copy of the final report should such be requested by you. Thank you in anticipation of your participation in this research.

Kind Regards,

Nozuko Aurelia April.

For enquiries, please contact:

Researcher: Nozuko Aurelia April

E-mail: NApril2@metrorail.co.za

Cell: +27 764408281

Supervisor: Dr Andre de la Harpe

Department of Business Administration

Cape Peninsula University of Technology

E-Mail: andre@cencra.com

Phone: +27 824481058

8.4 Appendix C: Informed Consent form

Department of Business Administration

Cape Peninsula University of Technology

Tel: +27 21 460 4251

Fax No: +27 21 460 3716

INFORMED CONSENT FORM

I/we ……certify that my/our participation in the study: "Management Issues with Cloud Computing: A Small and Medium Enterprises perspective using TOE framework" by Nozuko Aurelia April is voluntary. I/we also certify that I/we am/are in the right state of mind to participate in this research.

By signing this form, I/we confirm my/our participation in the research on "Management Issues with Cloud Computing: A Small and Medium Enterprises perspective using TOE framework" either through face to face interviews or telephone interviews.

Signature..... Date: .....

8.5 Appendix D: The interview guide

Semi-structured questionnaires

Interview schedule:

Introductory remarks: With the constant changes in technology and the tight budget of FSPs, the FSPs are faced with the need to continuously find alternative ways to access needed technologies for their day to day activities. Cloud Computing is one of the major technologies that is capable of providing FSPs with the needed resources without putting a strain on their budgets. This study will be looking at Cloud Computing in FSPs from the selected financial institutions in Western Cape.

The aim: This study seeks to identify the issues and limitations that FSPs are facing in their adoption and implementation of Cloud Computing and to develop a framework which could assist FSPs in overcoming the limitations.

We are kindly requesting answers to the questions listed below in your good faith. Your answers will be used specifically for the purpose of this study and your responses will be treated with the highest degree of confidentiality and privacy. To confirm the relevance and applicability of the proposed framework in resolving the identified management issues, we will send you the proposed framework for your consideration.

Also, your participation in this interview is voluntary and allows anonymity as well as autonomy.

Section A: Participant's details

Name: _____	
surname: _____	Date: _____
Position: _____	Contact No: _____

Section B: Questions

RQ1: What are the issues associated with CC management for FSPs?
SQ1.1 What are the benefits of CC for FSPs?
IQ 1.1 .1 What is your understanding of Cloud Computing? Comment: This question aims to ensure that the participants understands Cloud Computing as a good understanding of Cloud Computing will allow them to provide answers which will assist in answering the research question.
IQ 1.1.2 Do you think you have the right infrastructure to use Cloud Computing? Comment: This question aims to ascertain whether the FSPs have necessary infrastructure or not. This is to determine whether they are enjoying any competitive advantage as a result of having the necessary infrastructure.
IQ 1.1.3 What factors influenced you to adopt Cloud Computing? Comment: This question aims to identify the reasons why FSPs are adopting Cloud Computing. It also aims to confirm some of the existing literature which has found that FSPs are adopting Cloud Computing because of its benefits such as low cost and anytime anywhere access.
IQ 1.1.4 What do you like about Cloud Computing? Comment: This question aims to identify the benefits of Cloud Computing from the perspective of the participants based on the personal experiences.
IQ 1.1.5 Have you defined or measured the business value of Cloud Computing? Comment: This question will determine the benefits of Cloud Computing for business as experienced by the participating FSPs. Understanding the business value of Cloud Computing can further encourage FSPs to utilise Cloud Computing and increase their chances of realising the expected benefits of Cloud Computing.
SRQ1.2 What are the challenges faced by FSPs in their adoption and implementation of CC?
IQ 1.2.1 What skills do you require to use Cloud Computing? Comment: Previous literature has found that lack of skills is one of the major challenges faced by FSPs in their adoption and implementation of Cloud Computing. This question aims to find out whether FSPs have the necessary skills to use Cloud Computing effectively. It will also help to determine if the issue of lack of skills is impeding the success of FSPs in relation to Cloud Computing.
IQ 1.2.2. Is there anything you dislike about Cloud Computing? Comment:

This question aims to identify the disadvantages of Cloud Computing as experienced by the participants**.**
IQ 1.2.3 What are the issues involved with the deployment of Cloud Computing? Comment: The aim of this question is to identify the issues and challenges faced by FSPs in utilising and accessing Cloud Computing.
IQ 1.2.4 Do you/your employees have the skills needed to use Cloud Computing effective? Comment: The question aims to determine whether the owners and staff of the participating FSPs possess the skills needed to use Cloud Computing effectively. It differs from IQ 1.2.1 because it hopes to determine whether the FSPs owners and staff actually possess the skills identified in IQ 1.2.1.
IQ 1.2.5 How confident are you on the safety of your data in the cloud? Comment: This question will help to determine whether FSPs have appropriate security measures in place to protect their data from unwanted access.
IQ 1.2.6 Do you have security measures in place to secure your Cloud Computing environment? Comment: This question aims to identify what kind of security measures are being used by FSPs.
IQ 1.2.7 How will you identify the right Cloud Computing vendor for your business? Comment: Based on existing literature, one of the challenges faced by organisations is the possibility of data lock in. This question aims to assist FSPs in coming up with ways to identify potential threats from service providers that are not reputable by identifying the right service provider right from the onset.
IQ 1.2.8 What are indicators that a Cloud Computing vendor is trustworthy? Comment: The answer to this question will assist with the development of a set of best practices and protocols that will assist FSPs in their use of Cloud Computing. It will also assist FSPs towards identifying and selecting the right service provider.
IQ 1.2.9 What challenges have you experienced regarding the use of Cloud Computing? Comment: The answer to this question will help identify the challenges that FSPs are facing when implementing Cloud Computing. It will contribute to the development of a set of best practices and protocols that will assist FSPs in their implementation of Cloud Computing.
IQ 1.2.10 How did you resolve the challenges? Comment: The answer to this question will also contribute towards the development of a set of best practices and protocols that will assist FSPs in their implementation of Cloud Computing.

SRQ1.3 What management tools do FSPs use when managing the complexities of CC?
IQ 1.3.1 Are you currently using any form of Cloud Computing? **Comment:** This question aims to confirm whether the FSPs are currently using any form of Cloud Computing and if so, identify the ones being used by FSPs in this study.
IQ 1.3.2 What type of cloud environment does your organisation currently use? **Comment:** This question aims to identify the cloud environment being utilised by the FSPs to understand why they have selected that environment and to determine if they are able to manage the complexities of CC effectively using the cloud environment they have chosen.

RQ 2: How can CC management challenges be minimised when considering CC solutions for FSPs?
SRQ2.1 How can a set of best practices and governance protocols assist FSPs with challenges faced when using CC?
IQ 2.1.1 Do you have any suggestion on how to avoid or minimise the problems associated with Cloud Computing? Comment: This question aims to determine whether the participants, based on their practical experience have found ways to minimise the issues associated with Cloud Computing as a step towards identifying a set of best practices and governance protocols which can assist FSPs in maximising the benefits and minimising the challenges faced when using Cloud Computing.
IQ 2.1.2 Do you have a service level agreement in place with your cloud service provider? Comment: This aim of this question is to ascertain whether FSPs are aware of service level agreement and if so, to determine whether they have one in place to ensure that they have a remedy in place should there be a breach from the service provider.
IQ 2.1.3 Do you know of any legal issues relating to Cloud Computing? Comment: From the literature, legal issues are a major problem faced by FSPs when implementing Cloud Computing. A good understanding of the legal issues surrounding Cloud Computing use can therefore assist FSPs in their Cloud Computing implementation.
IQ 2.1.4 How supportive are you of Cloud Computing initiatives? Comment: The support from management is vital for a successful Cloud Computing implementation. This question hopes to determine if the owners of the participating FSPs are supportive of Cloud Computing initiatives.
SRQ 2.2 How does FSPs management combat the challenges faced during the adoption and implementation of CC?

IQ 2.2.1 Do you have business continuity and disaster recovery (BCDR) plans in place for cloud environment? Comment: This question aims to determine the readiness of FSPs in cases when there is a disruption of cloud services due to unforeseen circumstances. The availability of BCDR plan can help FSPs to minimise the challenges faced when using Cloud Computing.
IQ 2.2.2 Do you have a Cloud Computing strategy in place? Comment: The availability of a Cloud Computing strategy can also assist FSPs to successfully implement Cloud Computing. This question aims to determine whether the FSPs have a Cloud Computing strategy in place as that can be a foundation towards developing a set of best practices and governance protocols that can assist FSPs in their use of Cloud Computing.
IQ 2.2.3 What tools do you use to manage the complexities involved in your Cloud Computing implementation? Comment: This question aims to identify any other tool or strategy used by FSPs in their implementation of Cloud Computing that has not been covered in the interview.

Thank you for your time and patience in answering the questions. Your contribution is highly appreciated.

8.6 Appendix E: Project Timescale

The research activities are planned in line with the requirements for the MTech in Business Administration degree by the Department of Business Administration of the Cape Peninsula University of Technology. The research is planned to be conducted within three years from 2017 to 2020. The activities, their description, duration, and expected completion dates are shown in Appendix E.

Research Activities and Deliverables

Activity	Description of the activity	Duration in months	Completion Dates
Research Proposal	This document describes the intended research and how the researcher planned to conduct the research.	6	20 February 2019
Literature Review	The findings of other literature in the same research area as the current research were discussed in this document.	3	27 May 2019
Research Design	The intended research method and approach that the researcher plans to follow in this research as well as the ethical issues associated with this research will be discussed in this document.	2	25 July 2019
Research Ethics Approval	The researcher submitted the research design and all other documents relevant to this research to the ethics committee of the Business Administration department, Cape Peninsula University of Technology for approval.	3	19 April 2019
Data Collection	This involves interviewing participants from selected FSPs and recording the interviews.	4	28 June 2019
Data Analysis	This involves transcription of the recorded interviews and obtaining meaningful information from the transcripts.	3	24 September 2019
Thesis Draft	This is a draft of the complete thesis after the researcher has completed the literature review, research design, data collection and analysis, findings, conclusions, recommendations and areas of future research. It will be submitted to the research supervisor for corrections,	3	30 December 2019

	suggestions or advice for improvement in the quality of the thesis.		
Final Thesis	This is the final copy of the thesis after all the required corrections would have been made. This copy will be submitted for evaluation after it has been approved by the research supervisor.	9	15 September 2020

8.7 Appendix F1: Interview Transcript of FSP1

Department of Business Administration

Cape Peninsula University of Technology

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The interview transcript - FSP1

1. **Introduction**

- Introduction and greetings
- Purpose of the interview
- Discuss the ethical procedures regarding the data that will be obtained during the interview
- Assure the participants that their information and data obtained during the interview will be kept confidential

2. **Participants' rights**

The participants will be provided with the following information

- The participants may choose to answer or refuse to answer a question
- The participants have the right to decline voice recording
- The participants may request a copy of the research results

3. **Section A: General questions**

1. Name of small and medium enterprise: P1
2. Organisational sector: Financial Sector
3. Core business of the small and medium enterprise: Provision of small loans
4. Size of the small and medium enterprise i.e. number of employees: 10
5. Number of years in business: 5 years
6. Is the owner/manager directly involved in making IT decision? Yes
7. Does the owner/manager have any cloud computing experience? Yes

Section B:

This section aims assess the cloud computing usage of small and medium enterprises based on the technology, organisation, and environment framework. The participants responses will assist in answering the research questions and contribute towards the development of the proposed framework which will assist small and medium enterprises in their adoption and implementation of cloud computing.

8. Researcher: What is your understanding of cloud computing?

   P1: Cloud computing is a concept whereby IT resources like software and hardware are provided to users by an external company on a pay per use basis. It is a cheaper way to access the resources that are often too expensive for small businesses like ours to afford. I think it's a good thing for small businesses like us.

9. Researcher: Do you think you have the right infrastructure to use cloud computing?

   P1: Well, I think we do because we have computers and internet access although the internet access is sometimes unreliable. It is also very expensive. I pay R1500 per month for the internet services that we use. In my view, a computer and internet access are the basic tools you need to use the cloud services.

10. Researcher: Are you currently using any form of cloud computing?

    P1: Yes. We use tools like Gmail, Office 365 for business, SMEasy which provides us with online business management and accounting capabilities. We also use a platform called Kineto for things like ebanking, eaccounts and payments solution. I have heard of Sage which provides integrated accounting and payroll solution, but we are not using it yet, I am currently looking into it. For our recruitment, we use Linkedin which I believe is also cloud computing.

    Researcher: Do you use any Infrastructure as a Service solution?

    P1: For our storage, we use a company called PointClick. They deal with the storage of all our data and we have a service level agreement that guarantees the protection and confidentiality of our data.

    Researcher: That is interesting to know. You look like you have a lot of It background

    P1: Yes, I have a bachelor's degree in information technology.

    Researcher: Oh, I see. Let's move on to the next question.

11. Researcher: What type of cloud environment does your organisation currently use?

    P1: We mainly use Software as a Service and Infrastructure as a Service

12. Researcher: What factors influenced you to adopt cloud computing?

- P1: Personally, I think the high cost of purchasing a server and even maintaining it attracted me to use IaaS for storage. It is cheaper when I look at the cost of buying and maintaining a server. The SaaS applications that we use are also cheaper because we only pay if we use them. We did not have to buy or pay license fees for them. Another thing is that the service provider does things like the upgrade of the software for us so, we don't have to spend time upgrading it ourselves. Basically, its low cost and accessibility is something that attracted me. The possibility to use cloud services at any time from any place is also a source of attraction for me because I am someone who likes to work from anywhere at my own convenience.

13. Researcher: What skills do you require to use cloud computing?

- P1: Basic computer skills. I believe that if you have the basic knowledge of how to use computers, you should be able to use cloud computing.

14. Researcher: What do you like about cloud computing?

- P1: The cost reduction it brings and the time you can save by leaving the installations, maintenance and upgrades to the service providers is something I really like about cloud computing.

15. Researcher: Is there anything you dislike about cloud computing?

- P1: Yes, I am concerned about security and privacy of data. Although we have a service level agreement and the service provider promises the security of our data, I still have my reservations. I am also concerned about the location of the data as this may raise some legal or jurisdiction issues. I am also concerned about the possibility of vendor lock-in as well as compliance and legal issues.

16. Researcher: What are the issues involved with the deployment of cloud computing?

- P1: We did not really encounter issues with the deployment of cloud computing. The only issue was when an employee could not access the system which I think was a password issue and it was resolved immediately.

17. Researcher: Do you have any suggestion on how to avoid or minimise the problems associated with cloud computing?

- P1: I think people should do a proper research into cloud computing and how it can help their business before adopting it. They should also find out about the benefits and disadvantages before adopting it. I believe that a good understanding of the benefits and limitations of Cloud Computing before adoption could increase the confidence of financial service providers and increase their usage of Cloud Computing for their core business activities.

18. Researcher: Do you have a service level agreement in place with your cloud service provider?

- P1: Yes

19. Researcher: Do you/your employees have the skills needed to use cloud computing effective?

- P1: Yes, I believe that we have the basic skills needed to use cloud computing.

20. Researcher: Do you know of any legal issues relating to cloud computing?

- P1: No

21. Researcher: How confident are you on the safety of your data in the cloud?

- P1: Yes, I have an IT degree so, for me it’s easy to understand how to use these cloud applications and services. Some of my employees also have a good background of IT so, they find it easy to use cloud computing services.

22. Researcher: How supportive are you of cloud computing initiatives?

- P1: As the owner of the business, I am very supportive of our cloud computing initiatives because I know it can improve our services to our customers and bring us a lot of benefits.

23. Researcher: Do you have security measures in place to secure your cloud computing environment?

- P1: We have a firewall and we use passwords to protect our data. The service providers also have their own security measures in place.

24. Researcher: Do you have business continuity and disaster recovery (BCDR) plans in place for cloud environment?

- P1: Nothing inhouse but our service providers do.

25. Researcher: Do you have a cloud computing strategy in place?

- P1: No

26. Researcher: Have you defined or measured the business value of cloud computing?

- P1: Not really.

27. Researcher: How will you identify the right cloud computing vendor for your business?

- P1: What I normally do is to decide on which service is suitable for our needs and then do some research on which companies offer those services. I would normally choose 3 to 5 companies and then do more research about them to later decide on one based on my findings.

28. Researcher: What are indicators that a cloud computing vendor is trustworthy?

- P1: If a service provider keeps to the service level agreements and responds timeously to customer issues, I think they are trustworthy.

29. Researcher: What challenges have you experienced regarding the use of cloud computing?

- P1: Our biggest challenge is internet. The internet service is not reliable as it often goes down for hours at times.

30. Researcher: How did you resolve the challenges?

- P1: What I have done now is subscribe to a different internet service provider on a pay as you go basis. So, if there is a problem with the one that we use on a day to day basis, we switch to the second provider. The problem with this is that the pay as you go provider is more expensive.

Researcher: Thank you very much for participating in this research.

8.8 Appendix F2: Interview Transcript of FSP2

Department of Business Administration

Cape Peninsula University of Technology

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The interview transcript – FSP2

1. **Introduction**

- Introduction and greetings
- Purpose of the interview
- Discuss the ethical procedures regarding the data that will be obtained during the interview
- Assure the participants that their information and data obtained during the interview will be kept confidential

2. **Participants' rights**

The participants will be provided with the following information

- The participants may choose to answer or refuse to answer a question
- The participants have the right to decline voice recording
- The participants may request a copy of the research results

3. **Section A: General questions**

1. Name of small and medium enterprise: P2
2. Organisational sector: Financial Sector
3. Core business of the small and medium enterprise: Loans
4. Size of the small and medium enterprise i.e. number of employees: 24
5. Number of years in business: 8 years
6. Is the owner/manager directly involved in making IT decision? Yes
7. Does the owner/manager have any cloud computing experience? Yes

Section B:

This section aims assess the cloud computing usage of small and medium enterprises based on the technology, organisation, and environment framework. The participants responses will assist in answering the research questions and contribute towards the development of the proposed framework which will assist small and medium enterprises in their adoption and implementation of cloud computing.

8. Researcher: What is your understanding of cloud computing?

   P2: Cloud computing provides users with access to computing resources such as software, infrastructure and platforms to develop their own software.

9. Researcher: Do you think you have the right infrastructure to use cloud computing?

   P2: Yes, we do. We have access to computers, internet services and me and one some of the workers have a very good background of IT.

10. Researcher: Are you currently using any form of cloud computing?

    P2: We are using cloud services like Gmail and Yahoo mail for our emails. We also use Facebook, Skype, Instagram and Twitter for advertisement and communication with customers. We use cloud services for our internet banking as well. Our staff use Youtube for video streaming. They get a lot of training videos on how to use applications and other things from Youtube. For storage, we use Dropbox, Google drive and Skydrive. We use AdvanceForce for our customer relationship management. We use a payroll cloud application called Pay Space for our pay roll and human resources needs.

11. Researcher: What type of cloud environment does your organisation currently use?

    P2: We use Software as a Service and Infrastructure as a Service

12. Researcher: What factors influenced you to adopt cloud computing?

- P2: The cost savings, usage based billing, ease of use, business continuity, ability to introduce new products to market in a timely manner, availability and reliability, possibility to work from anywhere at any time and the elasticity and flexibility to scale up or down based on demand are some of the things that attracted me to cloud computing.

13. Researcher: What skills do you require to use cloud computing?

- P2: You need basic computer skills like typing skills, how to open a document on the computer, how to save a document, how to delete a document, how to retrieve a document etc.

14. Researcher: What do you like about cloud computing?

- P2: Like I said earlier, the cost reduction, ease of use, ability to reach more customers, easy deployment of new products to the market, automatic updates, no installation, maintenance or upgrades from our side, improved communication and collaboration, reduced IT support, business continuity, more storage capacity and so on are some of the things I like about cloud computing.

15. Researcher: Is there anything you dislike about cloud computing?

- P2: I don’t like the reliance on the internet, possibility of outage, security and privacy issues, and lack of total control over data.

16. Researcher: What are the issues involved with the deployment of cloud computing?

- P2: The deployment is always easy, so we have not encountered any issues.

17. Researcher: Do you have any suggestion on how to avoid or minimise the problems associated with cloud computing?

- P2: Having a good understanding of cloud computing is important as it will help you know how to deal with issues when they arise. It is also important to select a credible service provider who can guarantee needed uptime. I think training of staff on how to use the cloud applications can also help to reduce the problems associated with cloud computing.

18. Researcher: Do you have a service level agreement in place with your cloud service provider?

- P2: Yes

19. Researcher: Do you/your employees have the skills needed to use cloud computing effective?

- P2: Yes, we have the basic skills to use the cloud. We also have the soft skills needed to manage our relationship with the service provider.

20. Researcher: Do you know of any legal issues relating to cloud computing?

- P2: No

21. Researcher: How confident are you on the safety of your data in the cloud?

- P2: We, based on our service level agreement, I am confident that our data is safe in the cloud.

22. Researcher: How supportive are you of cloud computing initiatives?

- P2: I am very supportive of our cloud computing initiatives because it is adding a lot of value to our business. For example, we are able to reach more customers and maintain a good relationship with all of them using a cloud computing service called AdvanceForce.

23. Researcher: Do you have security measures in place to secure your cloud computing environment?

- P2: Yes, we use passwords and one-time pin for security

24. Researcher: Do you have business continuity and disaster recovery (BCDR) plans in place for cloud environment?

- P2: No

25. Researcher: Do you have a cloud computing strategy in place?

- P2: No

26. Researcher: Have you defined or measured the business value of cloud computing?

- P2: Yes, we have investigated so many ways that cloud computing is adding value to our business and it's unbelievable. For example, our customers increased from 40 customers to about 200 customers from our use of cloud services.

27. Researcher: How will you identify the right cloud computing vendor for your business?

- P2: If they can deliver on their promises, then I think they are trustworthy. Before one can choose the service provider, I think one can find out from their existing customers about their service and based on what their customers have to say, one can decide whether to use their services or not.

28. Researcher: What are indicators that a cloud computing vendor is trustworthy?

- P2: The number of years they have been in business is something to look at because if they have been operating for long, chances are they are doing something right. Customer complaints and feedback on social platforms can also give an indication of a service providers trustworthiness.

29. Researcher: What challenges have you experienced regarding the use of cloud computing?

- P2: None that I can think of.

30. Researcher: How did you resolve the challenges?

- P2: Like I said, we have not really encountered any challenges with our cloud computing services.

Researcher: Thank you very much for participating in this research.

8.9 Appendix F3: Interview Transcript of FSP3

Department of Business Administration

Cape Peninsula University of Technology

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The interview transcript – FSP3

1. **Introduction**

- Introduction and greetings
- Purpose of the interview
- Discuss the ethical procedures regarding the data that will be obtained during the interview
- Assure the participants that their information and data obtained during the interview will be kept confidential

2. **Participants' rights**

The participants will be provided with the following information

- The participants may choose to answer or refuse to answer a question
- The participants have the right to decline voice recording
- The participants may request a copy of the research results

3. **Section A: General questions**

1. Name of small and medium enterprise: P3
2. Organisational sector: Financial Sector
3. Core business of the small and medium enterprise: Loan services
4. Size of the small and medium enterprise i.e. number of employees: 15
5. Number of years in business: 3 years
6. Is the owner/manager directly involved in making IT decision? Yes
7. Does the owner/manager have any cloud computing experience? Yes

Section B:

This section aims assess the cloud computing usage of small and medium enterprises based on the technology, organisation, and environment framework. The participants responses will assist in answering the research questions and contribute towards the development of the proposed framework which will assist small and medium enterprises in their adoption and implementation of cloud computing.

8. Researcher: What is your understanding of cloud computing?

   P3: It is the provision of computing services to customers who access these services over the internet and pay based on their usage of these services.

9. Researcher: Do you think you have the right infrastructure to use cloud computing?

   P3: Yes. We have internet access and we have our laptops and desktop computers to access cloud services.

10. Researcher: Are you currently using any form of cloud computing?

    P3: Yes. We use Gmail, Facebook, Skype and GoogleDrive. We also use a cloud service called Zuora for our customer invoicing. We use Gusto for our payroll and employee benefits. It is a cloud-based application.

11. Researcher: What type of cloud environment does your organisation currently use?

    P3: Software as a Service

12. Researcher: What factors influenced you to adopt cloud computing?

- P3: The low cost and the need not to be left behind as other are already using it.

13. Researcher: What skills do you require to use cloud computing?

- P3: I'm not sure but to start with, I think you should be computer literate to use cloud computing.

14. Researcher: What do you like about cloud computing?

- P3: The increased flexibility, better collaboration, lower cost, improved scalability and reduced need for IT personnel are things I love about cloud computing. It really makes things easier.

15. Researcher: Is there anything you dislike about cloud computing?

- P3: My biggest issue is that my workers have little or can I say insufficient knowledge of cloud computing. The security issue of cloud computing is something I don't like about cloud computing. Also, internet is very expensive, but we are forced to pay for internet because we need it order to access cloud computing.

16. Researcher: What are the issues involved with the deployment of cloud computing?

- P3: The biggest issue we have encountered was outage when we could not access the service and customers were frustrated as we needed to check their credit record to decide whether to give them a loan or not. We had to call the service provider and wait until they resolved it before we were able to assist the customers.

17. Researcher: Do you have any suggestion on how to avoid or minimise the problems associated with cloud computing?

- P3: I think having a reliable service provider is very important and you rely on them to resolve most of the issues from their side. So, it is essential to perform a thorough research on the credibility of the service provider before selecting a service provider.

18. Researcher: Do you have a service level agreement in place with your cloud service provider?

- P3: Yes

19. Researcher: Do you/your employees have the skills needed to use cloud computing effective?

- P3: Yes

20. Researcher: Do you know of any legal issues relating to cloud computing?

- P3: I have not experienced any, but I am aware that some service providers that offer storage services might have their servers located in other countries which may lead to legal and jurisdiction issues in case where there is a problem with the data.

21. Researcher: How confident are you on the safety of your data in the cloud?

- P3: I think I have about 70 percent confidence as there is possibility of unwanted person gaining access to our data either from our side or from the service providers side.

22. Researcher: How supportive are you of cloud computing initiatives?

- P3: I m very supportive of our cloud computing initiatives.

23. Researcher: Do you have security measures in place to secure your cloud computing environment?

- P3: Yes, we use passwords.

24. Researcher: Do you have business continuity and disaster recovery (BCDR) plans in place for cloud environment?

- P3: Our service provider deals with that.

25. Researcher: Do you have a cloud computing strategy in place?

- P3: Yes, we have training and development programmes in place to ensure that our staff know how to use the cloud services.

26. Researcher: Have you defined or measured the business value of cloud computing?

- P3: No

27. Researcher: How will you identify the right cloud computing vendor for your business?

- P3: We first look at vendor that have trial versions of their services and use the trial versions. We then compare which of the vendors best suit our needs based on our experience using the trial versions.

28. Researcher: What are indicators that a cloud computing vendor is trustworthy?

- P3: A trustworthy service provider should be able to guarantee at least 99.9 percent uptime and keep to the service level agreements.

29. Researcher: What challenges have you experienced regarding the use of cloud computing?

- P3: Reliance on internet service is our biggest challenge. When there is a problem with the internet, it affects our ability to access the cloud services.

30. Researcher: How did you resolve the challenges?

- P3: We call the service providers and report the issue then we wait for them to resolve it.

Researcher: Thank you very much for participating in this research.

8.10 Appendix F4: Interview Transcript of FSP4

Department of Business Administration

Cape Peninsula University of Technology

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The interview transcript – FSP4

1. **Introduction**

- Introduction and greetings
- Purpose of the interview
- Discuss the ethical procedures regarding the data that will be obtained during the interview
- Assure the participants that their information and data obtained during the interview will be kept confidential

2. **Participants' rights**

The participants will be provided with the following information

- The participants may choose to answer or refuse to answer a question
- The participants have the right to decline voice recording
- The participants may request a copy of the research results

3. **Section A: General questions**

1. Name of small and medium enterprise: P4
2. Organisational sector: Financial sector
3. Core business of the small and medium enterprise: Small loans
4. Size of the small and medium enterprise i.e. number of employees: 32
5. Number of years in business: 3
6. Is the owner/manager directly involved in making IT decision? Yes
7. Does the owner/manager have any cloud computing experience? Yes

Section B:

This section aims assess the cloud computing usage of small and medium enterprises based on the technology, organisation, and environment framework. The participants responses will assist in answering the research questions and contribute towards the development of the proposed framework which will assist small and medium enterprises in their adoption and implementation of cloud computing.

8. Researcher: What is your understanding of cloud computing?

   P4: Cloud computing is the availability of computer resources to users over the internet. The users can access the resources on-demand and pay per use. This means that they are kind of renting the resources from the third-party service provider.

9. Researcher: Do you think you have the right infrastructure to use cloud computing?

   P4: I think so because cloud computing requires just basic infrastructure.

10. Researcher: Are you currently using any form of cloud computing?

    P4: Yes.

11. Researcher: What type of cloud environment does your organisation currently use?

    P4: We mainly use Software as a Service. For example, we use Gmail and Yahoo for emails. We use Facebook for advertisement and communication with customers and we use Google drive for storage. We are still looking into how we can utilise Cloud Computing for our main business activities like banking.

12. Researcher: What factors influenced you to adopt cloud computing?

- P4: Low cost, ease of use and the accessibility of cloud computing influenced my decision to adopt cloud computing.

13. Researcher: What skills do you require to use cloud computing?

- P4: Computer skills, I guess.

14. Researcher: What do you like about cloud computing?

- P4: Cloud computing has improved our mobility. We are now able to work from anywhere at any time. It is also cheap as we only pay for what we use so, there is no waste of resources. Also, we have access to Microsoft office suite which gives us access to things like Microsoft Word for typing our documents. This makes it affordable for us. Our use of Google drive helps us with data storage, and we can access the data from anywhere at any time. One or more employee can also access the data store at the same time by accessing a read only version which also assist in ensuring the integrity of the data as only one person can edit it at any given time. Cloud computing gives us access to new functionality that we could not afford ordinarily because of high infrastructure cost of traditional information technology.

15. Researcher: Is there anything you dislike about cloud computing?

- P4: The broadband issue and security issue are my biggest concern. With things like Platform as a Service and Infrastructure as a Service, more IT knowledge is required so, we cannot really adopt PaaS and IaaS for now. That is something I don't like as we should be benefiting from PaaS and IaaS as well. The issues with migration is also a problem as it can be different from existing in-house traditional IT. The issue of compliance in terms of the legal aspects relating to the storage of customers data

outside our company is something I dislike about cloud computing. Lack of regulation is something I don't like about cloud computing as it leaves the users with no clue about their legal rights in terms of problems with their data.

16. Researcher: What are the issues involved with the deployment of cloud computing?

- P4: The first issue is the level of readiness of the company. If the staff are not technologically inclined, it could lead to resistance which could in turn lead to failure of cloud computing. The support from the owner or management is also important because if the owner does not believe in cloud computing, it could lead to failure as well.

17. Researcher: Do you have any suggestion on how to avoid or minimise the problems associated with cloud computing?

- P4: Before implementing cloud computing, it is important to do some readiness evaluation to determine whether the organisation is ready or not. This will help to avoid implementation failure due to lack of readiness.

18. Researcher: Do you have a service level agreement in place with your cloud service provider?

- P4: Yes

19. Researcher: Do you/your employees have the skills needed to use cloud computing effective?

- P4: Not all of them but some of them have necessary IT skills to use cloud computing

20. Researcher: Do you know of any legal issues relating to cloud computing?

- P4: I know of the protection of personal information (POPI) act which is meant to ensure that companies do all they can to protect people's personal information. Apart from that, I do not know any other law or legislation. I think legal issues can also arise when data is stored in location with different laws from that of the organisation that owns the data.

21. Researcher: How confident are you on the safety of your data in the cloud?

- P4: I am not so confident about the safety of our data since its stored with the service provider. Anything can happen from their side. For example, there could be a case of malicious insider in which one of their employees can expose our data to an unwanted person.

22. Researcher: How supportive are you of cloud computing initiatives?

- P4: I am very supportive of our cloud computing initiatives because I believe that it has a lot to offer our business.

23. Researcher: Do you have security measures in place to secure your cloud computing environment?

- P4: The service provider deals with that but from our side, we use passwords to prevent access to unwanted persons.

24. Researcher: Do you have business continuity and disaster recovery (BCDR) plans in place for cloud environment?

- P4: The service provider deals with that also. For example, in our service level agreement, they said that they have our data stored on at least 2 different servers in case there is a problem with one, they can switch us to the other one with little or no interruptions to our ability to access the services.

25. Researcher: Do you have a cloud computing strategy in place?

- P4: No

26. Researcher: Have you defined or measured the business value of cloud computing?

- P4: No, we have never thought of that, but I think it's something we should look into.

27. Researcher: How will you identify the right cloud computing vendor for your business?

- P4: Looking at the number of years they have been in business is one thing. Another thing is to get references from their existing customers. One can also do some online research about them like looking at websites that deals with customer complaints such as HelloPeter.com to see customers comments about them.

28. Researcher: What are indicators that a cloud computing vendor is trustworthy?

- P4: I think if the service provider has at least 99 percent uptime and they stick to all the agreement in the service level agreement. They also need to carry out the agreed remedy in case they fail to deliver as promised.

29. Researcher: What challenges have you experienced regarding the use of cloud computing?

- P4: We have experienced some outages in which we could not access our data for a few days, and it affected our business. I think it was the internet that had a problem.

30. Researcher: How did you resolve the challenges?

- P4: We called the internet service provider and they resolved the issue.

Researcher: Thank you very much for participating in this research.

8.11 Appendix F5: Interview Transcript of FSP5

Department of Business Administration

Cape Peninsula University of Technology

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The interview transcript – FSP5

1. **Introduction**

- Introduction and greetings
- Purpose of the interview
- Discuss the ethical procedures regarding the data that will be obtained during the interview
- Assure the participants that their information and data obtained during the interview will be kept confidential

2. **Participants' rights**

The participants will be provided with the following information

- The participants may choose to answer or refuse to answer a question
- The participants have the right to decline voice recording
- The participants may request a copy of the research results

3. **Section A: General questions**

1. Name of small and medium enterprise: P5
2. Organisational sector: Financial Sector
3. Core business of the small and medium enterprise: Loans
4. Size of the small and medium enterprise i.e. number of employees: 23
5. Number of years in business: 8
6. Is the owner/manager directly involved in making IT decision? Yes
7. Does the owner/manager have any cloud computing experience? Yes

Section B:

This section aims assess the cloud computing usage of small and medium enterprises based on the technology, organisation, and environment framework. The participants responses will assist in answering the research questions and contribute towards the development of the proposed framework which will assist small and medium enterprises in their adoption and implementation of cloud computing.

8. Researcher: What is your understanding of cloud computing?

   P5: Cloud computing refers to the delivery of hosted services over the internet to different customers over the internet.

9. Researcher: Do you think you have the right infrastructure to use cloud computing?

   P5: Yes

10. Researcher: Are you currently using any form of cloud computing?

    P5: We are currently using Gmail and Twitter. We also use Facebook. That's all we use for now. We are doing research on how we can use Cloud Computing for our core business activities. I believe we will use it in the future for our core business activities as soon as we get more confidence on how to minimise the security and privacy issues.

11. Researcher: What type of cloud environment does your organisation currently use?

    P5: Software as a Service

12. Researcher: What factors influenced you to adopt cloud computing?

- P5: Well, it is cost effective and it saves a lot of time as we are able to reach more customers in limited time.

13. Researcher: What skills do you require to use cloud computing?

- P5: Cloud computing requires one to have experience of using a computer of any other device that you intend to use to access cloud services. With basic computer skills, I think one should be able to use cloud computing effectively.

14. Researcher: What do you like about cloud computing?

- P5: It allows us to have access to resources that we might not have been able to afford. These are resources that only the big companies could afford in the past so, it gives us access to compete with larger organisations. So, the low cost of entry is something I like about cloud computing. I also like the ease of migration as we initially thought it would be complex, but it was easier than we thought to migrate. The migration process was quick and easy. Since we have little investment on infrastructure, the low infrastructure requirement of cloud computing is something that I like about it. The improved storage capability is also something I like about cloud computing.

15. Researcher: Is there anything you dislike about cloud computing?

- P5: The loss of control over that is one thing I completely dislike about cloud computing. The over reliance of cloud computing on the internet is also something I don't like about cloud computing. The location of data and methods used for data protection by the service provider is unknown to us and I don't like that. I am concerned about compatibility issues with our existing systems. There is a lack of standardisation

among cloud providers, hence it might be difficult to move from one service provider to another in case one is not happy with the services of a service provider.

16. Researcher: What are the issues involved with the deployment of cloud computing?

- P5: Integration issue is one problem. Lack of needed IT skills is another problem. The issue of security and privacy is also a problem because due to lack of needed IT skills in-house, the service provider also helps with migration and that gives them access to sensitive customer information. The lack of adequate support from the government is one of the disadvantages of Cloud Computing. I think government support is important here in terms of things like regulations, review of laws relating to data protection and privacy and improved bandwidth availability. This will improve adoption and give prospective users more confidence. Personally, we had issues with internet access.

17. Researcher: Do you have any suggestion on how to avoid or minimise the problems associated with cloud computing?

- P5: I think adequate training should be given to the staff to improve their IT skills and boost their confidence in using cloud computing.

18. Researcher: Do you have a service level agreement in place with your cloud service provider?

- P5: Yes

19. Researcher: Do you/your employees have the skills needed to use cloud computing effective?

- P5: I do but most of my employees need training. I don't know where to send them for training.

20. Researcher: Do you know of any legal issues relating to cloud computing?

- P5: No

21. Researcher: How confident are you on the safety of your data in the cloud?

- P5: Not so confident because the service provider has more control of the data.

22. Researcher: How supportive are you of cloud computing initiatives?

- P5: Very supportive. I really want it to work because I know it will increase our productivity.

23. Researcher: Do you have security measures in place to secure your cloud computing environment?

- P5: No, the service provider does that. The only thing I know is that we have passwords which we use to access the services.

24. Researcher: Do you have business continuity and disaster recovery (BCDR) plans in place for cloud environment?

- P5: No

25. Researcher: Do you have a cloud computing strategy in place?

- P5: No

26. Researcher: Have you defined or measured the business value of cloud computing?

- P5: No

27. Researcher: How will you identify the right cloud computing vendor for your business?

- P5: Word of mouth or testing their services before actual adoption if they have a trial version.

28. Researcher: What are indicators that a cloud computing vendor is trustworthy?

- P5: A service provider is trustworthy if they can provide all the services they promise and if they are available to resolve issues immediately.

29. Researcher: What challenges have you experienced regarding the use of cloud computing?

- P5: Internet problem is the main challenge that we have. It's expensive and its sometimes not reliable.

30. Researcher: How did you resolve the challenges?

- P5: Well, we can't do much as we have to wait for the service provider to resolve whatever issues.

Researcher: Thank you very much for participating in this research.

8.12 **Appendix F6: Interview Transcript of FSP6**

Department of Business Administration

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The interview transcript – FSP6

1. **Introduction**

- Introduction and greetings
- Purpose of the interview
- Discuss the ethical procedures regarding the data that will be obtained during the interview
- Assure the participants that their information and data obtained during the interview will be kept confidential

2. **Participants' rights**

The participants will be provided with the following information

- The participants may choose to answer or refuse to answer a question
- The participants have the right to decline voice recording
- The participants may request a copy of the research results

3. **Section A: General questions**

1. Name of small and medium enterprise: P6
2. Organisational sector: Financial Sector
3. Core business of the small and medium enterprise: Finance
4. Size of the small and medium enterprise i.e. number of employees: 19
5. Number of years in business: 5
6. Is the owner/manager directly involved in making IT decision? Yes
7. Does the owner/manager have any cloud computing experience? Yes

Section B:

This section aims assess the cloud computing usage of small and medium enterprises based on the technology, organisation, and environment framework. The participants responses will assist in answering the research questions and contribute towards the development of the proposed framework which will assist small and medium enterprises in their adoption and implementation of cloud computing.

8. Researcher: What is your understanding of cloud computing?

   P6: Cloud computing is the provision of storage, software, and services to clients over the internet. It allows the users to access these resources without having to purchase them.

9. Researcher: Do you think you have the right infrastructure to use cloud computing?

   P6: I think so.

10. Researcher: Are you currently using any form of cloud computing?

    P6: No

    Researcher: Are you sure about that? Do you use things like Gmail or Yahoo for e-mails?

    P6: Most of us use Gmail a lot.

    Researcher: What about Facebook?

    P6: We also use Facebook to communicate with our customers.

    Researcher: Those are some form of cloud computing. They are Software as a Service.

    P6: Oh, okay.

11. Researcher: What type of cloud environment does your organisation currently use?

    P6: I think its Software as a Service since you said Gmail and Facebook are Software as a Service

    Researcher: Yes, they are.

12. Researcher: What factors influenced you to adopt cloud computing?

- P6: I think we are using Gmail and Facebook because they are cheap, and they allow us to reach more customers. We are also able to access our emails from anywhere at any time. Improved competitiveness is one reason why I adopted cloud computing because it allows us to focus on other important things while leaving IT related issues to the service providers. It also improves communication and collaboration. Also, it is environmentally friendly and it's a form of green IT. The pressure from competitor is something that attracted me. Most of the FSPs in my sector around me are using cloud computing services and they are reaping the benefits so, why not my business too? Improved resource utilization is another thing I like about cloud computing as it helps us to avoid waste and safe our resources.

13. Researcher: What skills do you require to use cloud computing?

- P6: I don't think there is any special skills needed. I think you would be able to use cloud computing as long as you are able to use the computer.

14. Researcher: What do you like about cloud computing?

- P6: The fact that we don't have to bother about installation, upgrades and maintenance makes me fall in love with it as most us are not so good with things like that. Also, it is cheaper and we only pay per use So, we can minimise the cost by using it only when it is necessary. For me, it is cost effective. It safes me money on infrastructure cost and as a small business, that's important to me. I do not have to buy everyone that works for me a computer. Most of them have their own device like smart phones and ipads which they use to access these applications. I also like the adaptability of cloud computing as it is able to cater for changing user requirements. For example, if my business grows and I need access for new workers, I can get them going almost immediately with cloud computing. The imporved communication with customers, workers and business partners are also among the reasons why I like cloud computing.

15. Researcher: Is there anything you dislike about cloud computing?

- P6: The security and privacy concerns are two thinks I don't like about cloud computing. I also dislike its dependence on the internet. The issue with availability is also something I dislike about cloud computing. It could be either because there is a problem with internet service of because there is a problem from the service provider. This could result in disruptions in our service to our customers. The problem with where data is physically located is also of concern to me because it may lead to legal or jurisdictional issues. The lack of technical skills by my workers is also a problem. Also, one thing I dislike about cloud computing is the lack of ability to know the exact cost upfront as this limit our ability to plan our budget effectively. The lack of customisation is something I also don't lie about cloud computing.

16. Researcher: What are the issues involved with the deployment of cloud computing?

- P6: The biggest issue for us is awareness. Many of my staff are not aware of cloud computing and it makes me reluctant to use it for core activities because of the fear of possible resistance from my staff due to their fear of technologies.

17. Researcher: Do you have any suggestion on how to avoid or minimise the problems associated with cloud computing?

- P6: Yes, training is important. If the workers are trained on how to use cloud computing services, it will improve their awareness and boost their confidence.

18. Researcher: Do you have a service level agreement in place with your cloud service provider?

- P6: No

19. Researcher: Do you/your employees have the skills needed to use cloud computing effective?

- P6: I do. Some of my staff also have the basic computer skills needed for cloud computing.

20. Researcher: Do you know of any legal issues relating to cloud computing?

- P6: No

21. Researcher: How confident are you on the safety of your data in the cloud?

- P6: Not confident

22. Researcher: How supportive are you of cloud computing initiatives?

- P6: Very supportive

23. Researcher: Do you have security measures in place to secure your cloud computing environment?

- P6: Yes, we use passwords.

24. Researcher: Do you have business continuity and disaster recovery (BCDR) plans in place for cloud environment?

- P6: No
- Researcher: So, does your service provider take care of that?
- P6: I'm not sure

25. Researcher: Do you have a cloud computing strategy in place?

- P6: No

26. Researcher: Have you defined or measured the business value of cloud computing?

- P6: No

27. Researcher: How will you identify the right cloud computing vendor for your business?

- P6: I will find out about their reputation in the market to see if their existing customers are happy with them or not.

28. Researcher: What are indicators that a cloud computing vendor is trustworthy?

- P6: A service provider is trustworthy if they can ensure the security and privacy of your data. A trustworthy service provider should also ensure that the service level agreement is always reached.

29. Researcher: What challenges have you experienced regarding the use of cloud computing?

- P6: I think our biggest challenge so far is the lack of technical skills to troubleshoot technical problems. For example, there are times when there is a problem with the internet that we could have resolved ourselves instead of waiting for the service providers, but we could not.

30. Researcher: How did you resolve the challenges?

- P6: I have gone for some computer training and I can now resolve some minor technical issues on my own. We only call the service providers if it's a serious issue that I cannot resolve on my own.

Researcher: Thank you very much for participating in this research.

8.13 **Appendix F7: Interview Transcript of FSP7**

Department of Business Administration

Cape Peninsula University of Technology

Tel: +27 21 460 4251

Fax No: +27 21 460 3716

The interview transcript – FSP7

1. **Introduction**

- Introduction and greetings
- Purpose of the interview
- Discuss the ethical procedures regarding the data that will be obtained during the interview
- Assure the participants that their information and data obtained during the interview will be kept confidential

2. **Participants' rights**

The participants will be provided with the following information

- The participants may choose to answer or refuse to answer a question
- The participants have the right to decline voice recording
- The participants may request a copy of the research results

3. **Section A: General questions**

1. Name of small and medium enterprise: P7
2. Organisational sector: Financial sector
3. Core business of the small and medium enterprise: Loans
4. Size of the small and medium enterprise i.e. number of employees: 45
5. Number of years in business: 13 years
6. Is the owner/manager directly involved in making IT decision? Yes
7. Does the owner/manager have any cloud computing experience? Yes

Section B:

This section aims assess the cloud computing usage of small and medium enterprises based on the technology, organisation, and environment framework. The participants responses will assist in answering the research questions and contribute towards the development of the proposed framework which will assist small and medium enterprises in their adoption and implementation of cloud computing.

8. Researcher: What is your understanding of cloud computing?

   P7: Cloud computing is the provision of computing service in a way similar to how utilities such as water and electricity are provided.

9. Researcher: Do you think you have the right infrastructure to use cloud computing?

   P7: Yes

10. Researcher: Are you currently using any form of cloud computing?

    P7: We are currently using applications like Gmail and Yahoo for emails and Goggle drive for data storage

11. Researcher: What type of cloud environment does your organisation currently use?

    P7: Software as a Service and Infrastructure as a Service

12. Researcher: What factors influenced you to adopt cloud computing?

- P7: Low cost of cloud computing compared to the traditional method, ease of use and the ability to work from any place at any time.

13. Researcher: What skills do you require to use cloud computing?

- P7: Basic computer skills, I guess.

14. Researcher: What do you like about cloud computing?

- P7: No software installation or maintenance, shorter deployment time, anytime anywhere access and the low cost of cloud computing are some of the things I like about cloud computing. I also like the fast implementation and scalability of cloud computing.

15. Researcher: Is there anything you dislike about cloud computing?

- P7: The security and privacy issues of cloud computing is a big problem with cloud computing and there is a risk involved. Our data might be exposed to unwanted person if care is not taken. I also don't like the way we cannot access cloud computing without internet.

16. Researcher: What are the issues involved with the deployment of cloud computing?

- P7: Integration issue is number one for me. Lack of IT skills by most of my staff is another issue that we encountered during our deployment of cloud computing.

17. Researcher: Do you have any suggestion on how to avoid or minimise the problems associated with cloud computing?

- P7: I think training the staff on how to use cloud computing is essential before deployment takes place. Doing a proper investigation on how to integrate the existing applications with cloud computing is also important before deployment as it will allow us to identify and select applications that can be easily integrated with our existing applications.

18. Researcher: Do you have a service level agreement in place with your cloud service provider?

- P7: Yes

19. Researcher: Do you/your employees have the skills needed to use cloud computing effective?

- P7: Not really

20. Researcher: Do you know of any legal issues relating to cloud computing?

- P7: No

21. Researcher: How confident are you on the safety of your data in the cloud?

- P7: I am confident to some extent, but I still have my reservations

22. Researcher: How supportive are you of cloud computing initiatives?

- P7: I am the biggest supporter because I believe it can lead to growth and expansion of my business in the shortest time possible.

23. Researcher: Do you have security measures in place to secure your cloud computing environment?

- P7: Yes, we access all our cloud applications by using passwords.

24. Researcher: Do you have business continuity and disaster recovery (BCDR) plans in place for cloud environment?

- P7: No, the service provider is in charge of that.

25. Researcher: Do you have a cloud computing strategy in place?

- P7: No

26. Researcher: Have you defined or measured the business value of cloud computing?

- P7: No

27. Researcher: How will you identify the right cloud computing vendor for your business?

- P7: Word of mouth

28. Researcher: What are indicators that a cloud computing vendor is trustworthy?

- P7: The percentage of uptime that they offer and their level of commitment to the service level agreement.

29. Researcher: What challenges have you experienced regarding the use of cloud computing?

- P7: Down time issue, internet problem and identity theft when someone was able to use our application by getting hold of an employee's password.

30. Researcher: How did you resolve the challenges?

- P7: We informed the service providers and they resolve the issues. With the password issue, we changed the password of the employee when we discovered that someone was using her account.

Researcher: Thank you very much for participating in this research.

8.14 **Appendix F8: Interview Transcript of FSP8**

Department of Business Administration

Cape Peninsula University of Technology

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The interview transcript – FSP8

1. **Introduction**

- Introduction and greetings
- Purpose of the interview
- Discuss the ethical procedures regarding the data that will be obtained during the interview
- Assure the participants that their information and data obtained during the interview will be kept confidential

2. **Participants' rights**

The participants will be provided with the following information

- The participants may choose to answer or refuse to answer a question
- The participants have the right to decline voice recording
- The participants may request a copy of the research results

3. **Section A: General questions**

1. Name of small and medium enterprise: P8
2. Organisational sector: Financial sector
3. Core business of the small and medium enterprise: Loan
4. Size of the small and medium enterprise i.e. number of employees: 17
5. Number of years in business: 8
6. Is the owner/manager directly involved in making IT decision? Yes
7. Does the owner/manager have any cloud computing experience? Yes

Section B:

This section aims assess the cloud computing usage of small and medium enterprises based on the technology, organisation, and environment framework. The participants responses will assist in answering the research questions and contribute towards the development of the proposed framework which will assist small and medium enterprises in their adoption and implementation of cloud computing.

8. Researcher: What is your understanding of cloud computing?

   P8: Cloud computing is a way of providing users with access to resources like applications, development platforms, servers, services and networks over the internet on a pay per use basis.

9. Researcher: Do you think you have the right infrastructure to use cloud computing?

   P8: Yes

10. Researcher: Are you currently using any form of cloud computing?

    P8: Yes, we use Gmail for emails, and we use Facebook for advertisement and communication with our customers. We also get a lot of customer through Facebook.

    Researcher: Why are you not using Cloud Computing for your core business activities?

    P8: We are concerned about the security of our data. We are trying to find ways to ensure that it's save before we begin using it for our core business activities. I'm sure we will figure it out soon and begin to use it for our core business activities.

11. Researcher: What type of cloud environment does your organisation currently use?

    P8: Software as a Service

12. Researcher: What factors influenced you to adopt cloud computing?

- P8: Competitive pressure and the need to survive is the main reason why I opted for cloud computing. Also, the low cost of entry attracted my interest in cloud computing.

13. Researcher: What skills do you require to use cloud computing?

- P8: Typing skills, reading skills and general computer skills.

14. Researcher: What do you like about cloud computing?

- P8: The nice thing about cloud computing is that one can increase or decrease the resources as the business grows. The low cost of entry is another nice thing about cloud computing. There is no need for IT experts as the complex IT operations are performed by the service providers so, it makes things easier for us. The service provider promises high availability which to me is an assurance that we can rely on the service. The high availability is of a high importance to us as we cannot afford to be offline. I like the automatic updates because it saves us time.

15. Researcher: Is there anything you dislike about cloud computing?

- P8: The possible regulatory and compliance issues that may arise if the service provider stores the data in a different country or in a place where the law is different from that of the place where the business is located. The problem of integrating cloud services with the legacy systems is also an issue. The high cost of bandwidth and

over reliance of cloud computing on the internet are two of the things I dislike about cloud computing.

16. Researcher: What are the issues involved with the deployment of cloud computing?

- P8: Lack of readiness for the technology, firm size because bigger firms will have the capacity to dedicate some staff members to technological issues, security and privacy issues.

17. Researcher: Do you have any suggestion on how to avoid or minimise the problems associated with cloud computing?

- P8: Training and development should be offered to staff members as this can increase their readiness level and make them more aware of cloud computing and how to use it effectively.

18. Researcher: Do you have a service level agreement in place with your cloud service provider?

- P8: Yes.

19. Researcher: Do you/your employees have the skills needed to use cloud computing effective?

- P8: Yes

20. Researcher: Do you know of any legal issues relating to cloud computing?

- P8: No

21. Researcher: How confident are you on the safety of your data in the cloud?

- P8: Not so confident.

22. Researcher: How supportive are you of cloud computing initiatives?

- P8: I am highly supportive of our cloud computing initiatives. I encourage all my employees to openly use cloud applications as it has the potential to improve our business processes.

23. Researcher: Do you have security measures in place to secure your cloud computing environment?

- P8: Yes, we have our username and passwords for accessing the applications.

24. Researcher: Do you have business continuity and disaster recovery (BCDR) plans in place for cloud environment?

- P8: No

25. Researcher: Do you have a cloud computing strategy in place?

- P8: No

26. Researcher: Have you defined or measured the business value of cloud computing?

- P8: No

27. Researcher: How will you identify the right cloud computing vendor for your business?

- P8: Testing their applications first for compatibility with our needs.

28. Researcher: What are indicators that a cloud computing vendor is trustworthy?

- P8: Service availability

29. Researcher: What challenges have you experienced regarding the use of cloud computing?

- P8: Integration and migration issues. We have also encountered issues with the accessibility on some occasions.

30. Researcher: How did you resolve the challenges?

- P8: We still have some of our old applications on premises because we could not integrate the with our cloud computing services. With accessibility, we log a call to the service provider and they resolve the issues.

Researcher: Thank you very much for participating in this research.

8.15 Appendix F9: Interview Transcript of FSP9

Department of Business Administration

Cape Peninsula University of Technology

Tel: +27 21 460 4251

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The interview transcript – FSP9

1. **Introduction**

- Introduction and greetings
- Purpose of the interview
- Discuss the ethical procedures regarding the data that will be obtained during the interview
- Assure the participants that their information and data obtained during the interview will be kept confidential

2. **Participants' rights**

The participants will be provided with the following information

- The participants may choose to answer or refuse to answer a question
- The participants have the right to decline voice recording
- The participants may request a copy of the research results

3. **Section A: General questions**

1. Name of small and medium enterprise: P9
2. Organisational sector: Financial Sector
3. Core business of the small and medium enterprise: Loan
4. Size of the small and medium enterprise i.e. number of employees: 14
5. Number of years in business: 2
6. Is the owner/manager directly involved in making IT decision? Yes
7. Does the owner/manager have any cloud computing experience? Yes

Section B:

This section aims assess the cloud computing usage of small and medium enterprises based on the technology, organisation, and environment framework. The participants responses will assist in answering the research questions and contribute towards the development of the proposed framework which will assist small and medium enterprises in their adoption and implementation of cloud computing.

8. Researcher: What is your understanding of cloud computing?

   P9: I know that cloud computing is a concept in which IT resources are provided to clients on a pay as you go basis. The clients request the resources on demand and only pay when they use the resources.

9. Researcher: Do you think you have the right infrastructure to use cloud computing?

   P9: Yes

10. Researcher: Are you currently using any form of cloud computing?

    P9: We use Gmail and Goggle drive. Our website is hosted by Google through their Google AppEngine which is also a cloud service.

11. Researcher: What type of cloud environment does your organisation currently use?

    P9: Software as a Service and Infrastructure as a Service

12. Researcher: What factors influenced you to adopt cloud computing?

- P9: Improved access to resources, low cost of entry, high availability, internal resources are freed, and we can focus on our core activities, improved mobility as we can work from anywhere at any time, improved collaboration and communication. It also allows us to get more customers so, it expands our customer base.

13. Researcher: What skills do you require to use cloud computing?

- P9: Basic computer skills such as typing skills, reading skills, copying and pasting, deleting etc.

14. Researcher: What do you like about cloud computing?

- P9: The flexibility, rapid deployment, reduction of in-house IT infrastructure and improved communication and collaboration. It gives us access to more customers i.e. it expands our customer base. It is cost effective and we can access it from anywhere in the world at any given time. I also like the simplicity of cloud computing because all the technical issues like the set up and maintenance of ICT infrastructure are done by the service provider so we can focus on our core business. The reduction in the need for hardware investment is also something I like about cloud computing. Improved access to resources like software and hardware.

15. Researcher: Is there anything you dislike about cloud computing?

- P9: The possibility of data lock in, possibility of losing critical business data and less tailored software as the service provider tries to provide a solution for everyone. The possibility of service disruptions can lead to loss of income for the business. The loss of control over data is also a concern for me as the service provider has more control over the data that is stored on their server. The lack of standards and regulation is

also of concern to me. Some of the applications have unsolicited advertising which can be irritating at times especially when you are in the middle of something important. Some employees are resistant to change because of the fear of technologies. Lack of enough service providers gives the few available one's the chance to do what they like.

16. Researcher: What are the issues involved with the deployment of cloud computing?

- P9: Limited customisation, integration issues, security and privacy issues, bandwidth issues, lack of technical knowledge in-house, lack of vendor management strategies, lack of standardisation which may lead to data lock-in when switching vendors or lead to integration issues when integrating with existing IT systems.

17. Researcher: Do you have any suggestion on how to avoid or minimise the problems associated with cloud computing?

- P9: Improved readiness level before adoption will help to minimise these issues.

18. Researcher: Do you have a service level agreement in place with your cloud service provider?

- P9: Yes.

19. Researcher: Do you/your employees have the skills needed to use cloud computing effective?

- P9: Yes.

20. Researcher: Do you know of any legal issues relating to cloud computing?

- P9: No

21. Researcher: How confident are you on the safety of your data in the cloud?

- P9: A bit confident

22. Researcher: How supportive are you of cloud computing initiatives?

- P9: Highly supportive

23. Researcher: Do you have security measures in place to secure your cloud computing environment?

- P9: Yes, we have usernames and passwords.

24. Researcher: Do you have business continuity and disaster recovery (BCDR) plans in place for cloud environment?

- P9: Our service provider deals with that

25. Researcher: Do you have a cloud computing strategy in place?

- P9: No

26. Researcher: Have you defined or measured the business value of cloud computing?

- P9: No

27. Researcher: How will you identify the right cloud computing vendor for your business?

- P9: Asking their existing clients about their service is one way. We can also look at how long they have been in service because if they have been around for so many years, there is a chance that they are doing something well and they would have gained more experience in the field.

28. Researcher: What are indicators that a cloud computing vendor is trustworthy?

- P9: High availability and their commitment to the service level agreement.

29. Researcher: What challenges have you experienced regarding the use of cloud computing?

- P9: Bandwidth issues is the main issue we are experiencing. The internet goes down from time to time and it affects our cloud computing services.

30. Researcher: How did you resolve the challenges?

- P9: The issue is always resolved by our internet service providers.

Researcher: Thank you very much for participating in this research.

8.16 **Appendix F10: Interview Transcript of FSP10**

Department of Business Administration

Cape Peninsula University of Technology

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The interview transcript - FSP10

1. **Introduction**

- Introduction and greetings
- Purpose of the interview
- Discuss the ethical procedures regarding the data that will be obtained during the interview
- Assure the participants that their information and data obtained during the interview will be kept confidential

2. **Participants' rights**

The participants will be provided with the following information

- The participants may choose to answer or refuse to answer a question
- The participants have the right to decline voice recording
- The participants may request a copy of the research results

3. **Section A: General questions**

1. Name of small and medium enterprise: P10
2. Organisational sector: Financial sector
3. Core business of the small and medium enterprise: Loans
4. Size of the small and medium enterprise i.e. number of employees: 38
5. Number of years in business: 2 years
6. Is the owner/manager directly involved in making IT decision? Yes
7. Does the owner/manager have any cloud computing experience? Yes

Section B:

This section aims assess the cloud computing usage of small and medium enterprises based on the technology, organisation, and environment framework. The participants responses will assist in answering the research questions and contribute towards the development of the proposed framework which will assist small and medium enterprises in their adoption and implementation of cloud computing.

8. Researcher: What is your understanding of cloud computing?

   P10: Cloud computing

9. Researcher: Do you think you have the right infrastructure to use cloud computing?

   P10: Yes

10. Researcher: Are you currently using any form of cloud computing?

    P10: We use Gmail for our emails, and we use a cloud service from MTN called MTN Webplus to host our website. We use an application called Zoho for invoicing and expense tracking. We also use it for simple reporting.

11. Researcher: What type of cloud environment does your organisation currently use?

    P10: Software as a Service

12. Researcher: What factors influenced you to adopt cloud computing?

- P10: Low cost of cloud computing and the availability.

13. Researcher: What skills do you require to use cloud computing?

- P10: Computer skills

14. Researcher: What do you like about cloud computing?

- P10: It helps to reduce the total cost of ownership because the installation, upgrades and maintenance are done by the service providers. Thus, it helps to reduce cost as the initial and operating cost are low i.e. low infrastructure requirement and no need for installation, upgrades and maintenance by the user. It improves mobility, usability and accessibility. Communication and collaboration are also improved.

15. Researcher: Is there anything you dislike about cloud computing?

- P10: The high cost of bandwidth for internet connectivity and the speed of internet is an issue. There are times when the internet is completely down and there are times when it's too slow. It takes maybe an hour to access what should normally take a minute. That is not good for our business. The lack of expertise in house is a problem as most of my employees need training before they can effectively use cloud computing.

16. Researcher: What are the issues involved with the deployment of cloud computing?

- P10: Lack of awareness is one issue because we are limited in our knowledge of cloud computing. We only know a little about it. Some of our employees don't even know anything about it.

17. Researcher: Do you have any suggestion on how to avoid or minimise the problems associated with cloud computing?

- P10: From our experience, we have realised that it is important to conduct an extensive research to create more awareness about a technology before adopting that technology.

18. Researcher: Do you have a service level agreement in place with your cloud service provider?

- P10: We do.

19. Researcher: Do you/your employees have the skills needed to use cloud computing effective?

- P10: Few of my employees have the needed skills but most of the will need to be trained. I think the awareness of cloud computing is not enough, but I think it will improve as we use more and more of cloud computing applications.

20. Researcher: Do you know of any legal issues relating to cloud computing?

- P10: No

21. Researcher: How confident are you on the safety of your data in the cloud?

- P10: A bit confident

22. Researcher: How supportive are you of cloud computing initiatives?

- P10: Very supportive

23. Researcher: Do you have security measures in place to secure your cloud computing environment?

- P10: Yes, we use passwords.

24. Researcher: Do you have business continuity and disaster recovery (BCDR) plans in place for cloud environment?

- P10: Yes.

25. Researcher: Do you have a cloud computing strategy in place?

- P10: No

26. Researcher: Have you defined or measured the business value of cloud computing?

- P10: No

27. Researcher: How will you identify the right cloud computing vendor for your business?

- P10: I think the best way is to try their service first before signing up for their service.

28. Researcher: What are indicators that a cloud computing vendor is trustworthy?

- P10: If they respond on time to issues and they do as agreed in the service level agreement, then I think they are trustworthy.

29. Researcher: What challenges have you experienced regarding the use of cloud computing?

- P10: Internet problems mainly. We also face some technological issues at times due to our limited knowledge of IT.

30. Researcher: How did you resolve the challenges?

- P10: We call the service provider and ask for help.

Researcher: Thank you very much for participating in this research.

8.17 **Appendix F11: Interview Transcript of FSP11**

Department of Business Administration

Cape Peninsula University of Technology

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The interview transcript - FSP11

1. **Introduction**

- Introduction and greetings
- Purpose of the interview
- Discuss the ethical procedures regarding the data that will be obtained during the interview
- Assure the participants that their information and data obtained during the interview will be kept confidential

2. **Participants' rights**

The participants will be provided with the following information

- The participants may choose to answer or refuse to answer a question
- The participants have the right to decline voice recording
- The participants may request a copy of the research results

3. **Section A: General questions**

1. Name of small and medium enterprise: P11
2. Organisational sector: Financial Sector
3. Core business of the small and medium enterprise: Provision of short-term loans
4. Size of the small and medium enterprise i.e. number of employees: 37
5. Number of years in business: 8 years
6. Is the owner/manager directly involved in making IT decision? Yes
7. Does the owner/manager have any cloud computing experience? Yes

Section B:

This section aims assess the cloud computing usage of small and medium enterprises based on the technology, organisation, and environment framework. The participants responses will assist in answering the research questions and contribute towards the development of the proposed framework which will assist small and medium enterprises in their adoption and implementation of cloud computing.

8. Researcher: What is your understanding of cloud computing?

   P11: Cloud computing allows users to access IT resources over the internet and they only pay for what they use. It's like renting the resources from the service provider.

9. Researcher: Do you think you have the right infrastructure to use cloud computing?

   P11: We definitely have the right infrastructure to use the cloud computing services. We just need to have training in place to get all our staff members on board.

10. Researcher: Are you currently using any form of cloud computing?

    P11: We are currently using Gmail, Office 365, Kineto and Sage.

    Researcher: Do you use any Infrastructure as a Service solution?

    P11: Yes, we use Google cloud storage for storing most of our data.

11. Researcher: What type of cloud environment does your organisation currently use?

    P11: We use Software as a Service and Infrastructure as a Service but we use more of Software as a Service.

12. Researcher: What factors influenced you to adopt cloud computing?

- P11: The low cost of entry and the fact that we don't have to worry about the maintenance of the infrastructure is a big influence for me. It allows us to store more data that we were able to store with our in-house storage and it also improves our access to data by allowing us to access new sets of data.

13. Researcher: What skills do you require to use cloud computing?

- P11: Simple IT skills like typing, copy and paste, how to navigate etc. I also think that new skills like negotiation skills are needed to be able to manage the contract with the service provider.

14. Researcher: What do you like about cloud computing?

- P11: It makes it easier to access our data on demand from any place at any time. I also like the low cost to entry as I mentioned earlier.

15. Researcher: Is there anything you dislike about cloud computing?

- P11: The security and privacy of data is of major concern for me. The dependence on the internet is another major issue for me as the cost of internet is still very high.

16. Researcher: What are the issues involved with the deployment of cloud computing?

- P11: The need to have new skills such as negotiation skills. The limited knowledge of staff members in handling technologies is also an issue.

17. Researcher: Do you have any suggestion on how to avoid or minimise the problems associated with cloud computing?

- P11: Training of staff on how to handle technologies will come in handy.

18. Researcher: Do you have a service level agreement in place with your cloud service provider?

- P11: Yes

19. Researcher: Do you/your employees have the skills needed to use cloud computing effective?

- P11: There are 3 of us that are very good with IT. Others need to be trained.

20. Researcher: Do you know of any legal issues relating to cloud computing?

- P11: I don't

21. Researcher: How confident are you on the safety of your data in the cloud?

- P11: I would say I have 50 percent confidence because anything can happen.

22. Researcher: How supportive are you of cloud computing initiatives?

- P11: I love technologies so, I am very supportive of our cloud computing initiatives.

23. Researcher: Do you have security measures in place to secure your cloud computing environment?

- P11: We have username and passwords which we use to access our cloud computing applications.

24. Researcher: Do you have business continuity and disaster recovery (BCDR) plans in place for cloud environment?

- P11: We don't have any in place.

25. Researcher: Do you have a cloud computing strategy in place?

- P11: No.

26. Researcher: Have you defined or measured the business value of cloud computing?

- P11: Not really.

27. Researcher: How will you identify the right cloud computing vendor for your business?

- P11: The best thing is to test their services before adopting it. Maybe use a trial version and if you're happy, you can then adopt it.

28. Researcher: What are indicators that a cloud computing vendor is trustworthy?

- P11: If they respond on time to issues and complaints and they provide all the services needed then, I think they can be trusted.

29. Researcher: What challenges have you experienced regarding the use of cloud computing?

- P11: The main challenge is the lack of necessary skills by some of our staff members. Only few of us have the necessary skills. The high cost of internet is also a challenge as we are a small organisation and cannot afford the internet at times.

30. Researcher: How did you resolve the challenges?

- P11: I try to train my employees by myself on how to use the cloud computing applications that we use. The issue of the high cost of internet is still there. We cannot really do much about that. I think the government needs to regulate the cost of internet to ensure that they are affordable for small businesses.

Researcher: Thank you very much for participating in this research.

8.18 **Appendix F12: Interview Transcript of FSP12**

Department of Business Administration

Cape Peninsula University of Technology

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The interview transcript - FSP12

1. **Introduction**

- Introduction and greetings
- Purpose of the interview
- Discuss the ethical procedures regarding the data that will be obtained during the interview
- Assure the participants that their information and data obtained during the interview will be kept confidential

2. **Participants' rights**

The participants will be provided with the following information

- The participants may choose to answer or refuse to answer a question
- The participants have the right to decline voice recording
- The participants may request a copy of the research results

3. **Section A: General questions**

1. Name of small and medium enterprise: P12
2. Organisational sector: Financial Sector
3. Core business of the small and medium enterprise: Cash loans
4. Size of the small and medium enterprise i.e. number of employees: 18
5. Number of years in business: 7 years
6. Is the owner/manager directly involved in making IT decision? Yes
7. Does the owner/manager have any cloud computing experience? Yes

Section B:

This section aims assess the cloud computing usage of small and medium enterprises based on the technology, organisation, and environment framework. The participants responses will assist in answering the research questions and contribute towards the development of the proposed framework which will assist small and medium enterprises in their adoption and implementation of cloud computing.

8. Researcher: What is your understanding of cloud computing?

   P12: It is the provision of software, hardware and other IT infrastructure to users over the internet on a pay as you go basis just like our cell phones.

9. Researcher: Do you think you have the right infrastructure to use cloud computing?

   P12: We have computers, internet enabled phones and internet access which are the basic infrastructure needed to use cloud computing.

10. Researcher: Are you currently using any form of cloud computing?

    P12: We use Gmail, Facebook, Skype, Youtube, Dropbox and Twitter.

    Researcher: From what you've said, I noticed that you are mainly using Cloud Computing for general business activities like communication and storage. Do you store sensitive information like your transaction details or any other core business activities on the cloud?

    P12: No, we have our own server where we store all our sensitive data. We will consider Cloud Computing for things like that in future but for now, we are still using our own server.

11. Researcher: What type of cloud environment does your organisation currently use?

    P12: I think it's Software as a Service and Infrastructure as a Service

12. Researcher: What factors influenced you to adopt cloud computing?

- P12: The ease of use and the cost reduction are some of the factors that made me adopt cloud computing.

13. Researcher: What skills do you require to use cloud computing?

- P12: I would say basic computer skills.

14. Researcher: What do you like about cloud computing?

- P12: The ease of use of cloud computing applications, the cost reduction, improved storage capacity and reduced workload from our side in terms of things like installation, upgrades or maintenance because the service provider does that for us.

15. Researcher: Is there anything you dislike about cloud computing?

- P12: The possibility of data lock in is not nice because the service provider has more power over our data. The security and privacy issues around cloud computing is also an issue for me.

16. Researcher: What are the issues involved with the deployment of cloud computing?

- P12: The deployment was outsourced to a company so, we did not have any issue with the deployment.

17. Researcher: Do you have any suggestion on how to avoid or minimise the problems associated with cloud computing?

- P12: It is important to make sure that your employees are knowledgeable about cloud computing and confident in using it. Maybe training can help with that. Also, having a service level agreement will ensure that the service provider is held responsible for any breach in security and privacy.

18. Researcher: Do you have a service level agreement in place with your cloud service provider?

- P12: Yes, we do.

19. Researcher: Do you/your employees have the skills needed to use cloud computing effective?

- P12: Yes, some of our staff are very good with information technology.

20. Researcher: Do you know of any legal issues relating to cloud computing?

- P12: I am not aware of any legal issue relating to cloud computing.

21. Researcher: How confident are you on the safety of your data in the cloud?

- P12: I am a bit confident, but I know that there could be a breach from the service provider.

22. Researcher: How supportive are you of cloud computing initiatives?

- P12: I love technologies and I would embrace any technology that has the potential to improve my business any time any day. So, I am very supportive of our cloud computing initiatives.

23. Researcher: Do you have security measures in place to secure your cloud computing environment?

- P12: Yes, we use one-time pin to access our cloud computing applications.

24. Researcher: Do you have business continuity and disaster recovery (BCDR) plans in place for cloud environment?

- P12: No

25. Researcher: Do you have a cloud computing strategy in place?

- P12: No

26. Researcher: Have you defined or measured the business value of cloud computing?

- P12: We have not done that.

27. Researcher: How will you identify the right cloud computing vendor for your business?

- P12: I would look at our requirements and look at the available cloud offerings that can satisfy those requirements. I would then investigate the different cloud computing vendors and what they offer and decide based on the outcome of my investigation.

28. Researcher: What are indicators that a cloud computing vendor is trustworthy?

- P12: The feedback from their existing clients from platforms like hello Peter will be useful in determining their trustworthiness.

29. Researcher: What challenges have you experienced regarding the use of cloud computing?

- P12: Our internet service sometimes goes down and we are unable to access our cloud applications at such times. We also experience delays when there is an issue with the application, and we have to inform the service providers and wait for them to resolve the issues before we can regain access to the application. This sometimes happen on busy days like month end.

30. Researcher: How did you resolve the challenges?

- P12: During month ends, when it gets so busy, if the system goes down, we do some things manually and later enter them into the system when the system is back online. That needs to be improved by the service providers. Both the internet service providers and cloud computing service providers need to make sure they are able to cope with the high demand during peak periods like month ends.

Researcher: Thank you very much for participating in this research.

8.19 **Appendix F13: Interview Transcript of FSP13**

Department of Business Administration

Cape Peninsula University of Technology

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The interview transcript - FSP13

1. **Introduction**

- Introduction and greetings
- Purpose of the interview
- Discuss the ethical procedures regarding the data that will be obtained during the interview
- Assure the participants that their information and data obtained during the interview will be kept confidential

2. **Participants' rights**

The participants will be provided with the following information

- The participants may choose to answer or refuse to answer a question
- The participants have the right to decline voice recording
- The participants may request a copy of the research results

3. **Section A: General questions**

1. Name of small and medium enterprise: P13
2. Organisational sector: Financial Sector
3. Core business of the small and medium enterprise: Cash loans
4. Size of the small and medium enterprise i.e. number of employees: 16
5. Number of years in business: 2 years
6. Is the owner/manager directly involved in making IT decision? Yes
7. Does the owner/manager have any cloud computing experience? Yes

Section B:

This section aims assess the cloud computing usage of small and medium enterprises based on the technology, organisation, and environment framework. The participants responses will assist in answering the research questions and contribute towards the development of the proposed framework which will assist small and medium enterprises in their adoption and implementation of cloud computing.

8. Researcher: What is your understanding of cloud computing?

   P13: Cloud computing gives customers access to computing resources and allows them to pay only when they use the service. It allows users to use software, develop their own applications and also use hardware on demand.

9. Researcher: Do you think you have the right infrastructure to use cloud computing?

   P13: Yes, I think so.

10. Researcher: Are you currently using any form of cloud computing?

    P13: Yes. We use Facebook, Skype, Gmail, and Twitter.

    Researcher: So, you don't use any accounting package or Hr package or any other Cloud Computing Application for your main business activities.

    P13: Yes, we are not using them for now, but we are planning to use them in future.

11. Researcher: What type of cloud environment does your organisation currently use?

    P13: Software as a Service

12. Researcher: What factors influenced you to adopt cloud computing?

- P13: It is cheaper in the long run and it allows us to focus on our core business activities.

13. Researcher: What skills do you require to use cloud computing?

- P13: I think one needs to be computer literate. One should also possess some soft skills like people management and contract negotiation.

14. Researcher: What do you like about cloud computing?

- P13: It improves collaboration and it is easy to use. I also like the fact that it reduces the need to hire specialised IT personnel's because most of the technical stuffs are handled by the service providers.

15. Researcher: Is there anything you dislike about cloud computing?

- P13: Its dependence on the internet as well as the security and privacy issues are two of the things, I dislike about cloud computing. It is not easy to customise most cloud computing applications as they are mostly one size fits all and are made for everyone. This is a problem because there is no uniqueness in that.

16. Researcher: What are the issues involved with the deployment of cloud computing?

- P13: Lack of needed IT skills in-house is a big issue. Another issue is that it is sometimes difficult to integrate existing applications with cloud computing applications.

17. Researcher: Do you have any suggestion on how to avoid or minimise the problems associated with cloud computing?

- P13: The organisation should first investigate the possibility of integrating their existing applications with the intended cloud applications before adoption to ensure smooth deployment.

18. Researcher: Do you have a service level agreement in place with your cloud service provider?

- P13: Yes

19. Researcher: Do you/your employees have the skills needed to use cloud computing effective?

- P13: Some of us have the needed skills but other need some form of training.

20. Researcher: Do you know of any legal issues relating to cloud computing?

- P13: I don't know of any legal issues about cloud computing.

21. Researcher: How confident are you on the safety of your data in the cloud?

- P13: I am about 80 percent confident.

22. Researcher: How supportive are you of cloud computing initiatives?

- P13: I am one hundred percent supportive of our cloud computing initiatives.

23. Researcher: Do you have security measures in place to secure your cloud computing environment?

- P13: Yes, we have usernames and passwords.

24. Researcher: Do you have business continuity and disaster recovery (BCDR) plans in place for cloud environment?

- P13: None in-house but the service provider offers business continuity and disaster recovery as part of their package.

25. Researcher: Do you have a cloud computing strategy in place?

- P13: Yes, we do.

26. Researcher: Have you defined or measured the business value of cloud computing?

- P13: No

27. Researcher: How will you identify the right cloud computing vendor for your business?

- P13: What we did with some of the cloud computing applications that we currently use was to first use the trial versions before final adoption.

28. Researcher: What are indicators that a cloud computing vendor is trustworthy?

- P13: If the existing customers are happy, that is a good indicator. So, it might be worth it to get some recommendations from some of their existing customers.

29. Researcher: What challenges have you experienced regarding the use of cloud computing?

- P13: When the internet is bad, access to cloud computing services is a challenge.

30. Researcher: How did you resolve the challenges?

- P13: We always request the service providers to resolve the issues.

Researcher: Thank you very much for participating in this research.

8.20 Appendix F14: Interview Transcript of FSP14

Department of Business Administration

Cape Peninsula University of Technology

Tel: +27 21 460 4251

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The interview transcript - FSP14

1. **Introduction**

- Introduction and greetings
- Purpose of the interview
- Discuss the ethical procedures regarding the data that will be obtained during the interview
- Assure the participants that their information and data obtained during the interview will be kept confidential

2. **Participants' rights**

The participants will be provided with the following information

- The participants may choose to answer or refuse to answer a question
- The participants have the right to decline voice recording
- The participants may request a copy of the research results

3. **Section A: General questions**

1. Name of small and medium enterprise: P14
2. Organisational sector: Financial sector
3. Core business of the small and medium enterprise: Cash loans
4. Size of the small and medium enterprise i.e. number of employees: 27
5. Number of years in business: 9
6. Is the owner/manager directly involved in making IT decision? Yes
7. Does the owner/manager have any cloud computing experience? Yes

Section B:

This section aims assess the cloud computing usage of small and medium enterprises based on the technology, organisation, and environment framework. The participants responses will assist in answering the research questions and contribute towards the development of the proposed framework which will assist small and medium enterprises in their adoption and implementation of cloud computing.

8. Researcher: What is your understanding of cloud computing?

   P14: Cloud computing is a concept in which computing resources are provided for users over the internet. The users only pay if they use the service.

9. Researcher: Do you think you have the right infrastructure to use cloud computing?

   P14: We do.

10. Researcher: Are you currently using any form of cloud computing?

    P14: Yes, we have been using cloud computing for some time now. We use Gmail and Dropbox for communications and storage.

    Researcher: Do you use any Cloud application for any of your core business activities?

    P14: No, but we are looking into some applications. For example, we are looking at Sage which is a Cloud application for accounting and payroll services.

    Researcher: That's interesting.

11. Researcher: What type of cloud environment does your organisation currently use?

    P14: We use Software as a Service a lot. We also use Infrastructure as a Service.

12. Researcher: What factors influenced you to adopt cloud computing?

- P14: Its cheap since we only pay for what we use. Hence, it helps us to maximise the use of our resources. It allows us to focus on our core activities since the installation, maintenance and upgrade is done by the service provider.

13. Researcher: What skills do you require to use cloud computing?

- P14: I think the basic computer skills are essential plus some soft skills like good communication skills to be able to communicate and negotiate well with the service pro

14. Researcher: What do you like about cloud computing?

- P14: It provides us with unlimited storage, it is cheaper in the long run and its deployment is quick. Since the service provider takes care of the installation, maintenance and upgrades of the cloud applications, this gives us time to focus on our core business activities and thus allows us to reach out to the market in a timely manner.

15. Researcher: Is there anything you dislike about cloud computing?

- P14: The lack of access in times of poor internet connection and the possibility of data lock in are some of the things I hate about cloud computing.

16. Researcher: What are the issues involved with the deployment of cloud computing?

- P14: One of the issues is the interoperability and portability as it should be easy to integrate with existing systems and easy to switch providers when necessary without any lock-ins.

17. Researcher: Do you have any suggestion on how to avoid or minimise the problems associated with cloud computing?

- P14: All I can say is that FSPs should acquire adequate knowledge of cloud computing before adoption. They should also try and understand the issues and how to resolve them before finally adopting cloud computing. The government should develop laws and regulations that can guide cloud computing market. They should also provide funding for FSPs to encourage the use of cloud computing among FSPs.

18. Researcher: Do you have a service level agreement in place with your cloud service provider?

- P14: We have a service level agreement in place. It is very important.

19. Researcher: Do you/your employees have the skills needed to use cloud computing effective?

- P14: We do but I believe we need some training to equip us further.

20. Researcher: Do you know of any legal issues relating to cloud computing?

- P14: I don't know of any legal issue.

21. Researcher: How confident are you on the safety of your data in the cloud?

- P14: I am confident about the safety of our data. Our service provider has a good reputation and they are one of the leaders in the market.

22. Researcher: How supportive are you of cloud computing initiatives?

- P14: I support our cloud computing initiatives a lot. I know the importance of technologies.

23. Researcher: Do you have security measures in place to secure your cloud computing environment?

- P14: Yes. We have usernames and passwords which we use to access the cloud applications.

24. Researcher: Do you have business continuity and disaster recovery (BCDR) plans in place for cloud environment?

- P14: No, we do not have business continuity and disaster recovery (BCDR) plans in place.

25. Researcher: Do you have a cloud computing strategy in place?

- P14: Not at all.

26. Researcher: Have you defined or measured the business value of cloud computing?

- P14: Not yet.

27. Researcher: How will you identify the right cloud computing vendor for your business?

- P14: I think word of mouth is a good way. We would speak to some of their existing customers.

28. Researcher: What are indicators that a cloud computing vendor is trustworthy?

- P14: The level of satisfaction of their existing customers is a good indicator.

29. Researcher: What challenges have you experienced regarding the use of cloud computing?

- P14: The main challenge that we face is the poor internet services as it affects our ability to access cloud services.

30. Researcher: How did you resolve the challenges?

- P14: Whenever we have internet problems, we make contact with our service providers to fix the problems and once the problems are fixed, we the continue with our work.

Researcher: Thank you very much for participating in this research.

8.21 **Appendix F15: Interview Transcript of FSP15**

Department of Business Administration

Cape Peninsula University of Technology

Tel: +27 21 460 4251

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The interview transcript - FSP15

1. **Introduction**

- Introduction and greetings
- Purpose of the interview
- Discuss the ethical procedures regarding the data that will be obtained during the interview
- Assure the participants that their information and data obtained during the interview will be kept confidential

2. **Participants' rights**

The participants will be provided with the following information

- The participants may choose to answer or refuse to answer a question
- The participants have the right to decline voice recording
- The participants may request a copy of the research results

3. **Section A: General questions**

1. Name of small and medium enterprise: P15
2. Organisational sector: Financial Sector
3. Core business of the small and medium enterprise: Loans
4. Size of the small and medium enterprise i.e. number of employees: 22
5. Number of years in business: 8
6. Is the owner/manager directly involved in making IT decision? Yes
7. Does the owner/manager have any cloud computing experience? Yes

Section B:

This section aims assess the cloud computing usage of small and medium enterprises based on the technology, organisation, and environment framework. The participants responses will assist in answering the research questions and contribute towards the development of the proposed framework which will assist small and medium enterprises in their adoption and implementation of cloud computing.

8. Researcher: What is your understanding of cloud computing?

   P15: Cloud computing allows people to use computing resources which are provided by hosting companies over the internet on a pay per use basis.

9. Researcher: Do you think you have the right infrastructure to use cloud computing?

   P15: We are well equipped to use cloud computing.

10. Researcher: Are you currently using any form of cloud computing?

    P15: We mainly use cloud computing applications like Gmail, Yahoo mail and Twitter to communicate with our customers. We are busy looking at some other cloud applications for things like accounting, recruitment and human resources. We are going to start using some of them soon.

11. Researcher: What type of cloud environment does your organisation currently use?

    P15: We mainly Software as a Service for now but we are planning to use Infrastructure as a Service in the near future.

12. Researcher: What factors influenced you to adopt cloud computing?

- P15: Cloud computing is a very interesting technology. One of the main sources of attraction for us is the low cost of entry. The ease of use of the cloud application is another source of attraction for us.

13. Researcher: What skills do you require to use cloud computing?

- P15: I think anyone that can use a computer effectively should be able to use cloud computing. So, having the basic computer skills are essential.

14. Researcher: What do you like about cloud computing?

- P15: Cloud computing makes our job easy and allows us to reach more customers than we were able to reach without it. It also frees up time for us because the service provider performs the installation, upgrades and maintenance of the cloud applications. Hence, we are able to focus on the core activities of our business which is the provision of loans to our clients.

15. Researcher: Is there anything you dislike about cloud computing?

- P15: The reliance of cloud computing on the internet is one thing I don't like about cloud computing. I wish it could be used without the internet. That will really make it a powerful tool to use.

16. Researcher: What are the issues involved with the deployment of cloud computing?

- P15: For us, the main issue is the lack of an employee with technical knowledge needed for deployment. Although the service provider assisted us with that, it would have been better if we had someone inhouse to ensure the quality of service we get

from the service provider is up to standard. Also, migrating our data exposes some of our vital information to the service provider which is not too good because we deal with a lot of sensitive customer information.

17. Researcher: Do you have any suggestion on how to avoid or minimise the problems associated with cloud computing?

- P15: I think it is important to have someone inhouse with all the technical knowledge and experience needed to deploy cloud computing applications.

18. Researcher: Do you have a service level agreement in place with your cloud service provider?

- P15: We have a service level agreement which was signed by us and the service provider.

19. Researcher: Do you/your employees have the skills needed to use cloud computing effective?

- P15: We have the necessary skills needed but we still need training so that we can use it better.

20. Researcher: Do you know of any legal issues relating to cloud computing?

- P15: I don't know about the legal aspects of cloud computing, but I think our lawyer should be able to handle that for us.

21. Researcher: How confident are you on the safety of your data in the cloud?

- P15: I'm a bit confident because the service level agreement has a clause that would enforce the service provider to pay some penalties should there be a breach on their side. That will ensure that they take the safety of our data serious.

22. Researcher: How supportive are you of cloud computing initiatives?

- P15: I have a lot of support for our cloud computing initiatives.

23. Researcher: Do you have security measures in place to secure your cloud computing environment?

- P15: Yes, all our applications have usernames and passwords without which one cannot access them.

24. Researcher: Do you have business continuity and disaster recovery (BCDR) plans in place for cloud environment?

- P15: We do not have any in place.

25. Researcher: Do you have a cloud computing strategy in place?

- P15: None.

26. Researcher: Have you defined or measured the business value of cloud computing?

- P15: Yes, we have realised that our customer base has increased since we started using cloud computing. Our revenue has also doubled.

27. Researcher: How will you identify the right cloud computing vendor for your business?

- P15: The first thing is to match our requirements with what they offer and find out which one matches our requirements more. We would also find out from some of their existing customers on how satisfied they are with the services they receive from the service provider.

28. Researcher: What are indicators that a cloud computing vendor is trustworthy?

- P15: The longer a service provider has been in the market is one indication that they know what they are doing. Also, the less negative comments they receive from their clients indicates that their clients are happy and in turn indicates that they can be trusted.

29. Researcher: What challenges have you experienced regarding the use of cloud computing?

- P15: Our main challenge has always been with internet connectivity because we are unable to communicate with our clients whenever there is a problem with the internet.

30. Researcher: How did you resolve the challenges?

- P15: The service provider is always contacted and the fix the problem on their side. Sometimes, they also send their workers to us to come and resolve the issues if the problem is from our side.

Researcher: Thank you very much for participating in this research.

8.22 **Appendix F16: Interview Transcript of FSP16**

Department of Business Administration

Cape Peninsula University of Technology

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The interview transcript - FSP16

1. **Introduction**

- Introduction and greetings
- Purpose of the interview
- Discuss the ethical procedures regarding the data that will be obtained during the interview
- Assure the participants that their information and data obtained during the interview will be kept confidential

2. **Participants' rights**

The participants will be provided with the following information

- The participants may choose to answer or refuse to answer a question
- The participants have the right to decline voice recording
- The participants may request a copy of the research results

3. **Section A: General questions**

1. Name of small and medium enterprise: P16
2. Organisational sector: Financial Sector
3. Core business of the small and medium enterprise: Short term loans
4. Size of the small and medium enterprise i.e. number of employees: 11
5. Number of years in business: 1
6. Is the owner/manager directly involved in making IT decision? Yes
7. Does the owner/manager have any cloud computing experience? Yes

Section B:

This section aims assess the cloud computing usage of small and medium enterprises based on the technology, organisation, and environment framework. The participants responses will assist in answering the research questions and contribute towards the development of the proposed framework which will assist small and medium enterprises in their adoption and implementation of cloud computing.

8. Researcher: What is your understanding of cloud computing?

   P16: Cloud computing is the provision of computing technologies such as software and hardware to customers via the internet and allowing them to pay for it only when they use it.

9. Researcher: Do you think you have the right infrastructure to use cloud computing?

   P16: From what I know, we have computers, ipads, internet enabled phones and internet access which are the basic technologies needed to access cloud computing. So, I can confidently say that we have the right infrastructure to use cloud computing.

10. Researcher: Are you currently using any form of cloud computing?

    P16: We use Gmail for communications, and we use Google Drive for storage.

11. Researcher: What type of cloud environment does your organisation currently use?

    P16: We use both Software as a Service and Infrastructure as a Service.

12. Researcher: What factors influenced you to adopt cloud computing?

- P16: It improves communication and collaboration both among our staff and with our clients. It is also cheaper as we only pay for what we use which in a way helps us to maximise the use of our resources.

13. Researcher: What skills do you require to use cloud computing?

- P16: To use cloud computing, one just need to be computer literate. To manage the relationship with the service provider, one need to possess some soft skills like negotiation skills, conflict management skills, contract management skills and so on because they are vital in ensuring that the service provider lives up to expectations.

14. Researcher: What do you like about cloud computing?

- P16: It saves us both time and money. It is also scalable and flexible. For example, I can increase or decrease the number of employees with access to the cloud applications based on my business needs. Being on the internet, it has given us the opportunity to make more customers. In other words, it has expanded our customer base.

15. Researcher: Is there anything you dislike about cloud computing?

- P16: There are issues with the security and privacy of data stored in the cloud and that is of a big concern to me. I also have a problem with the automatic updates because there are times when the service provider updates the applications and some functionalities become hidden and I takes us time to figure them out.

16. Researcher: What are the issues involved with the deployment of cloud computing?

- P16: The main issue for us is the lack of training. We are a small organisation and cannot afford the training on how to use some of these applications. We are forced to learn on our own in most cases and that can be time consuming.

17. Researcher: Do you have any suggestion on how to avoid or minimise the problems associated with cloud computing?

- P16: I would suggest that one should have at least one IT staff that has knowledge of cloud computing and all the technicalities involved. That staff member can provide training for other staff members.

18. Researcher: Do you have a service level agreement in place with your cloud service provider?

- P16: We have a service level agreement although it was drafted by the service provider. We had a look and added some clauses which we felt was necessary. It was signed by all parties after our company and the service provider were satisfied with the contents.

19. Researcher: Do you/your employees have the skills needed to use cloud computing effective?

- P16: Some of us do and others need to be trained to be on the same level with us.

20. Researcher: Do you know of any legal issues relating to cloud computing?

- P16: I am not aware of the legal issues of cloud computing.

21. Researcher: How confident are you on the safety of your data in the cloud?

- P16: I have little confident since we are trusting so much of our data into other people's hands. They can make any mistake and that could negatively impact our organisation.

22. Researcher: How supportive are you of cloud computing initiatives?

- P16: I am highly supportive of our cloud computing initiatives.

23. Researcher: Do you have security measures in place to secure your cloud computing environment?

- P16: Yes, we have usernames and passwords. We also use fingerprint access for our devices. For example, all our desktop computers have fingerprint technologies and access is provided only after the fingerprint has been verified by the computer.

24. Researcher: Do you have business continuity and disaster recovery (BCDR) plans in place for cloud environment?

- P16: The only plan that we have is that we switch back to our old manual system whenever there is a problem with the cloud application. We then transfer all the data to the cloud application once the system is back online. This means double work for us at times but that is what we do.

25. Researcher: Do you have a cloud computing strategy in place?

- P16: We do not have any cloud specific strategy in place.

26. Researcher: Have you defined or measured the business value of cloud computing?

- P16: No, we have not measured that business value of cloud computing although we have noticed and improvement in our revenue since we started using cloud computing.

27. Researcher: How will you identify the right cloud computing vendor for your business?

- P16: The first thing that we always do is to look at different service providers and what they offer and to compare their offerings with our business needs. That way, we are able to select the one that closely matches our requirements.

28. Researcher: What are indicators that a cloud computing vendor is trustworthy?

- P16: A service provider is trustworthy if they can ensure an uptime of above 95 percent. They are also trustworthy if their response to customer queries are timely and if they are able to resolve customer issues on time.

29. Researcher: What challenges have you experienced regarding the use of cloud computing?

- P16: The main challenge for us is the high cost of internet access. If the internet is cheap, we would be able to have uninterrupted access.

30. Researcher: How did you resolve the challenges?

- P16: We have two internet service providers and we always compare their prices on a monthly basis. That's why we did not sign a long-term contract with either of them.

Researcher: Thank you very much for participating in this research.

8.23 **Appendix F17: Interview Transcript of FSP17**

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The interview transcript - FSP17

1. **Introduction**

- Introduction and greetings
- Purpose of the interview
- Discuss the ethical procedures regarding the data that will be obtained during the interview
- Assure the participants that their information and data obtained during the interview will be kept confidential

2. **Participants' rights**

The participants will be provided with the following information

- The participants may choose to answer or refuse to answer a question
- The participants have the right to decline voice recording
- The participants may request a copy of the research results

3. **Section A: General questions**

1. Name of small and medium enterprise: P17
2. Organisational sector: Financial sector
3. Core business of the small and medium enterprise: Loans
4. Size of the small and medium enterprise i.e. number of employees: 39
5. Number of years in business: 2 years
6. Is the owner/manager directly involved in making IT decision? Yes
7. Does the owner/manager have any cloud computing experience? Yes

Section B:

This section aims assess the cloud computing usage of small and medium enterprises based on the technology, organisation, and environment framework. The participants responses will assist in answering the research questions and contribute towards the development of the proposed framework which will assist small and medium enterprises in their adoption and implementation of cloud computing.

8. Researcher: What is your understanding of cloud computing?

   P17: Cloud computing allows users both individuals and organisations to access software and hardware over the internet.

9. Researcher: Do you think you have the right infrastructure to use cloud computing?

   P17: Sure, we do.

10. Researcher: Are you currently using any form of cloud computing?

    P17: We use Office 365 from Microsoft and we use Gmail, Facebook and Goggle drive.

    Researcher: Do you use any of the cloud applications for any of your core business activities?

    P17: No, but we plan to use Cloud Computing for our core business activities in the near future.

    Researcher: Okay, that's alright.

11. Researcher: What type of cloud environment does your organisation currently use?

    P17: I would say we use both Software as a Service and Infrastructure as a Service because Office 365 is Software as a Service and Goggle Drive is Infrastructure as a Service.

12. Researcher: What factors influenced you to adopt cloud computing?

- P17: The anytime anywhere access that it provides is one of the things that influenced us to adopt cloud computing. It is also cheap and easy to use. The automatic updates that it provides means that we do not have to waste time updating the software ourselves. This saves us time. I also like the fact that we do not have to buy expensive computers because even the cheapest and the most basic computer is enough to access cloud computing.

13. Researcher: What skills do you require to use cloud computing?

- P17: Being able to do simple things like switching on a computer, type, navigating, copying and pasting, logging on to the internet, troubleshooting a computer etc.

14. Researcher: What do you like about cloud computing?

- P17: I like the anytime any place access of cloud computing as well as the low cost.

15. Researcher: Is there anything you dislike about cloud computing?

- P17: I don't like the possibility of data lock-in and the issues of security and privacy. I also don't like the fact that it requires the internet to function. I think it gives too much power to the internet. Being a small organisation, whose core business is not IT, we

are unable to dedicate someone to our IT needs. I'm sure the bigger organisations might not have all the technical problems that we have as they can afford to dedicate someone for their IT needs. For us, we rely on the service provider for everything and they sometimes take time to respond.

16. Researcher: What are the issues involved with the deployment of cloud computing?

- P17: Some of the workers are not IT savvy and that makes the adoption process complex. Integrating with existing applications is also an issue.

17. Researcher: Do you have any suggestion on how to avoid or minimise the problems associated with cloud computing?

- P17: To overcome the issue of integration, one should do a research and find out the possibility of integrating the cloud computing application with existing applications before adoption.

18. Researcher: Do you have a service level agreement in place with your cloud service provider?

- P17: Of course, we do.

19. Researcher: Do you/your employees have the skills needed to use cloud computing effective?

- P17: Yes, most of us have the required skills.

20. Researcher: Do you know of any legal issues relating to cloud computing?

- P17: I don't know about the legal issues.

21. Researcher: How confident are you on the safety of your data in the cloud?

- P17: I have some confidence, but I also have some doubts. So, I would say its 50/50.

22. Researcher: How supportive are you of cloud computing initiatives?

- P17: I have so much interest in technologies so, I am a big supporter of our cloud computing initiatives.

23. Researcher: Do you have security measures in place to secure your cloud computing environment?

- P17: All our applications require a username and password before anyone can access them.

24. Researcher: Do you have business continuity and disaster recovery (BCDR) plans in place for cloud environment?

- P17: Not yet but we are working on it.

25. Researcher: Do you have a cloud computing strategy in place?

- P17: We are also working on that.

26. Researcher: Have you defined or measured the business value of cloud computing?

- P17: Not really but we can confirm that cloud computing is making a huge difference in our business and it's adding a lot of business values.

27. Researcher: How will you identify the right cloud computing vendor for your business?

- P17: By asking questions from their current customers and also comparing their offerings with other providers offerings and seeing which of them best suits our business requirements.

28. Researcher: What are indicators that a cloud computing vendor is trustworthy?

- P17: The level of satisfaction of their customers and their response time could be a good indicator as to whether or not a vendor is trustworthy.

29. Researcher: What challenges have you experienced regarding the use of cloud computing?

- P17: Our main challenge is always with internet connectivity.

30. Researcher: How did you resolve the challenges?

- P17: We always ask our internet service providers to resolve the issue for us.
-

Researcher: Thank you very much for participating in this research.

8.24 **Appendix F18: Interview Transcript of FSP18**

Department of Business Administration

Cape Peninsula University of Technology

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The interview transcript - FSP18

1. **Introduction**

- Introduction and greetings
- Purpose of the interview
- Discuss the ethical procedures regarding the data that will be obtained during the interview
- Assure the participants that their information and data obtained during the interview will be kept confidential

2. **Participants' rights**

The participants will be provided with the following information

- The participants may choose to answer or refuse to answer a question
- The participants have the right to decline voice recording
- The participants may request a copy of the research results

3. **Section A: General questions**

1. Name of small and medium enterprise: P18
2. Organisational sector: Financial sector
3. Core business of the small and medium enterprise: Loan
4. Size of the small and medium enterprise i.e. number of employees: 48
5. Number of years in business: 7
6. Is the owner/manager directly involved in making IT decision? Yes
7. Does the owner/manager have any cloud computing experience? Yes

Section B:

This section aims assess the cloud computing usage of small and medium enterprises based on the technology, organisation, and environment framework. The participants responses will assist in answering the research questions and contribute towards the development of the proposed framework which will assist small and medium enterprises in their adoption and implementation of cloud computing.

8. Researcher: What is your understanding of cloud computing?

   P18: Cloud computing offers a unique business model in which users are able to make use of computing resources provided by a service provider and pay when they use it. It's just like paying for utility bills like electricity and airtime.

9. Researcher: Do you think you have the right infrastructure to use cloud computing?

   P18: Since they say, cloud computing can be used on even the most basic computers, I think our computers are capable of running cloud computing applications.

10. Researcher: Are you currently using any form of cloud computing?

    P18: Yes, we make use of Gmail for communication.

    Researcher: Have you heard of other Cloud Computing applications especially for your core business activities like banking, loan administration, accounting and payroll etc.?

    P18: Yes, but we are not using them yet. We need to find out more about them. We will consider them as soon as we get enough information about them.

    Researcher: Okay.

11. Researcher: What type of cloud environment does your organisation currently use?

P18: For now, we only use Software as a Service. We are not yet so much into cloud computing. We are a very small business and our area of specialisation is not technologies. We also don't have any one with a lot of technical knowledge so, we are a bit reluctant to move our core business activities to cloud computing. We do not want to be stranded.

12. Researcher: What factors influenced you to adopt cloud computing?

- P18: It's a new thing and most of my competitors are either using it already or planning to start using it. So, it is important to also use it to keep up with others in the market. It also gives us the opportunity to be able to use sophisticated software and hardware without us having to buy it.

13. Researcher: What skills do you require to use cloud computing?

- P18: I am not sure of the skills needed to use cloud computing.

14. Researcher: What do you like about cloud computing?

- P18: It improves communication and it helps us in keeping records of our communication. I also like it because it's not expensive and we only pay when we use

it. Cloud computing has given us the opportunity to use technologies that we could not afford to use in the past. We can now use the same technology that only the rich and bigger organisations could use in the past.

15. Researcher: Is there anything you dislike about cloud computing?

- P18: The reliance on the internet is not a nice thing about cloud computing. It's also not nice for a third party to have access to all your private and sensitive communication with your customers and from what I have heard, Google can access all our emails. For me, that is a big drawback of cloud computing.

16. Researcher: What are the issues involved with the deployment of cloud computing?

- P18: We did not really have any issues with the deployment.

17. Researcher: Do you have any suggestion on how to avoid or minimise the problems associated with cloud computing?

- P18: Getting adequate information about cloud computing before adoption can help to minimise the problems associated with it.

18. Researcher: Do you have a service level agreement in place with your cloud service provider?

- P18: Yes.

19. Researcher: Do you/your employees have the skills needed to use cloud computing effective?

- P18: All our employees are able to use Gmail effectively, but I think as we adopt more complex cloud computing applications, we might not have the necessary skills needed to use them.

20. Researcher: Do you know of any legal issues relating to cloud computing?

- P18: No

21. Researcher: How confident are you on the safety of your data in the cloud?

- P18: I am confident but not so much.

22. Researcher: How supportive are you of cloud computing initiatives?

- P18: I am very supportive.

23. Researcher: Do you have security measures in place to secure your cloud computing environment?

- P18: We only have username and passwords.

24. Researcher: Do you have business continuity and disaster recovery (BCDR) plans in place for cloud environment?

- P18: No, we do not have any in place.

25. Researcher: Do you have a cloud computing strategy in place?

- P18: We don’t but I think its because we are not so much into cloud computing yet, we only use it for emails for now.

26. Researcher: Have you defined or measured the business value of cloud computing?

- P18: No, I think its also because we are not yet using so much of cloud computing.

27. Researcher: How will you identify the right cloud computing vendor for your business?

- P18: We will speak to some of their customers and find out from them if they are happy with the vendor.

28. Researcher: What are indicators that a cloud computing vendor is trustworthy?

- P18: Satisfaction of their existing customers.

29. Researcher: What challenges have you experienced regarding the use of cloud computing?

- P18: None for now.

30. Researcher: How did you resolve the challenges?

- P18: We have not experienced ant challenges at the moment.

Researcher: Thank you very much for participating in this research.

8.25 **Appendix F19: Interview Transcript of FSP19**

Department of Business Administration

Cape Peninsula University of Technology

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The interview transcript - FSP19

1. **Introduction**

- Introduction and greetings
- Purpose of the interview
- Discuss the ethical procedures regarding the data that will be obtained during the interview
- Assure the participants that their information and data obtained during the interview will be kept confidential

2. **Participants' rights**

The participants will be provided with the following information

- The participants may choose to answer or refuse to answer a question
- The participants have the right to decline voice recording
- The participants may request a copy of the research results

3. **Section A: General questions**

1. Name of small and medium enterprise: P19
2. Organisational sector: Financial Sector
3. Core business of the small and medium enterprise: provision of loans
4. Size of the small and medium enterprise i.e. number of employees: 15
5. Number of years in business: 3
6. Is the owner/manager directly involved in making IT decision? Yes
7. Does the owner/manager have any cloud computing experience? Yes

Section B:

This section aims assess the cloud computing usage of small and medium enterprises based on the technology, organisation, and environment framework. The participants responses will assist in answering the research questions and contribute towards the development of the proposed framework which will assist small and medium enterprises in their adoption and implementation of cloud computing.

8. Researcher: What is your understanding of cloud computing?

   P19: Cloud computing is a concept of offering IT resources over the internet. The users are able to access the resources such as hardware, software, applications and development platforms over the internet and pay based on their usage.

9. Researcher: Do you think you have the right infrastructure to use cloud computing?

   P19: I am confident that we have the necessary infrastructure to use cloud computing.

10. Researcher: Are you currently using any form of cloud computing?

    P19: We use Gmail, Goggle drive, and Facebook.

11. Researcher: What type of cloud environment does your organisation currently use?

    P19: We use more of Software as a Service but we also Infrastructure as a Service for data storage.

12. Researcher: What factors influenced you to adopt cloud computing?

- P19: Cloud computing helps to save a lot on cost. It also allows us to spend more time on our main business activities therefore giving us more focus. We are also able to work from home or anywhere we are as long as we are connected to the internet. That flexibility is one of the factors that influenced us to adopt cloud computing. With cloud computing, we are able to be up and running in no time as we can reach the market in a matter of minutes after setting up. The faster time to market is important to me as time is very important in our kind of business.

13. Researcher: What skills do you require to use cloud computing?

- P19: I think someone with the basic knowledge of how to use a personal computer should be able to use cloud computing.

14. Researcher: What do you like about cloud computing?

- P19: The speed at which you can be up and running when you need to use cloud computing is one thing, I like about it. The service is on-demand. It also helps to improve our communication with our customers. It improves access to data because we can now access huge amounts of data as quickly as possible.

15. Researcher: Is there anything you dislike about cloud computing?

- P19: There could be a service disruption if there is a problem with internet connectivity. The service provider also has more control over data than us. That is something I definitely dislike about cloud computing.

16. Researcher: What are the issues involved with the deployment of cloud computing?

- P19: The lack of adequate staff with needed IT knowledge is a problem because it makes us to be fully dependent on the service provider for the deployment. The

difficulty to integrate the cloud computing with in-house applications is a serious issue faced during the deployment of cloud computing.

17. Researcher: Do you have any suggestion on how to avoid or minimise the problems associated with cloud computing?

- P19: It is important to create awareness of cloud computing and the benefits it can bring to the business among employees. Once there is enough awareness, it can increase their interest in using cloud computing.

18. Researcher: Do you have a service level agreement in place with your cloud service provider?

- P19: Yes, we signed a service level agreement with our service providers and we are able to update it in future if the need arise.

19. Researcher: Do you/your employees have the skills needed to use cloud computing effective?

- P19: To some extent, I would say we have the necessary skills but if we come across more complex applications, we would have to organise some training with the service provider.

20. Researcher: Do you know of any legal issues relating to cloud computing?

- P19: No, I have not heard of any cloud computing regulation in South Africa.

21. Researcher: How confident are you on the safety of your data in the cloud?

- P19: I am some level of confidence, but the thing is, I do not have 100 percent confidence since a third party is involved. By third party, I am referring to the service provider.

22. Researcher: How supportive are you of cloud computing initiatives?

- P19: I am a big supporter because I know that cloud computing can improve our business activities and increase our revenue in a short time.

23. Researcher: Do you have security measures in place to secure your cloud computing environment?

- P19: We are using passwords and usernames for all our cloud computing applications.

24. Researcher: Do you have business continuity and disaster recovery (BCDR) plans in place for cloud environment?

- P19: Yes, we are able to switch back to our old systems if there is a problem with cloud computing.

25. Researcher: Do you have a cloud computing strategy in place?

- P19: We haven't thought of that yet.

26. Researcher: Have you defined or measured the business value of cloud computing?

- P19: We have not though of that either.

27. Researcher: How will you identify the right cloud computing vendor for your business?

- P19: It will be nice to have a demo of their services first to see if it is exactly what we are looking for. Most of the service providers have trial versions nowadays so, it is best to first use a trial version of the application to see its compatibility with our business before final adoption.

28. Researcher: What are indicators that a cloud computing vendor is trustworthy?

- P19: Their response time issues by their existing customers and the level of availability of the services are good indicators one should look out for.

29. Researcher: What challenges have you experienced regarding the use of cloud computing?

- P19: The high cost of internet services is our biggest challenge.

30. Researcher: How did you resolve the challenges?

- P19: We look at different providers and compare different packages and their prices and select which one best suit our needs and pocket.

Researcher: Thank you very much for participating in this research.

8.26 **Appendix F20: Interview Transcript of FSP20**

Department of Business Administration

Cape Peninsula University of Technology

Tel: +27 21 460 4251

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The interview transcript – FSP20

1. **Introduction**

- Introduction and greetings
- Purpose of the interview
- Discuss the ethical procedures regarding the data that will be obtained during the interview
- Assure the participants that their information and data obtained during the interview will be kept confidential

2. **Participants' rights**

The participants will be provided with the following information

- The participants may choose to answer or refuse to answer a question
- The participants have the right to decline voice recording
- The participants may request a copy of the research results

3. **Section A: General questions**

1. Name of small and medium enterprise: P20
2. Organisational sector: Financial Sector
3. Core business of the small and medium enterprise: Loan services
4. Size of the small and medium enterprise i.e. number of employees: 42
5. Number of years in business: 6 years and 8 months.
6. Is the owner/manager directly involved in making IT decision? Yes
7. Does the owner/manager have any cloud computing experience? Yes

Section B:

This section aims assess the cloud computing usage of small and medium enterprises based on the technology, organisation, and environment framework. The participants responses will assist in answering the research questions and contribute towards the development of the proposed framework which will assist small and medium enterprises in their adoption and implementation of cloud computing.

8. Researcher: What is your understanding of cloud computing?

   P20: Cloud computing is the delivery of hosted services to users over the internet. It could be software or hardware.

9. Researcher: Do you think you have the right infrastructure to use cloud computing?

   P20: I think we have the right infrastructure to use cloud computing.

10. Researcher: Are you currently using any form of cloud computing?

    P20: We use Gmail, Goggle drive and DropBox.

    Researcher: So, you are not yet using Cloud Computing for your main business activities like paying your customers and managing your customer data?

    P20: Yes. We are not using it for our main business activities yet. I think we will start using it for our main business activities soon.

    Researcher: Why do you think so?

    P20: We are busy investigating some of them because they could be cheaper than the one's we currently use which are not cloud based.

11. Researcher: What type of cloud environment does your organisation currently use?

    P20: At the moment, I think its Software as a Service and Infrastructure as a Service.

12. Researcher: What factors influenced you to adopt cloud computing?

- P20: It helps us to save money on capital expenditure buy not having to purchase expensive hardware, software and even IT support. So, it helps to save cost. It is also flexible and scalable therefore helping us to avoid resource wastage.

13. Researcher: What skills do you require to use cloud computing?

- P20: For me, I think being computer literate is enough.

14. Researcher: What do you like about cloud computing?

- P20: It provides us with latest versions of software without us having to worry about updates. That saves a lot of time for us. It also saves cost for us because we don't have to buy expensive hardware and software. We also don't have to pay license fees. We only pay for what we use.

15. Researcher: Is there anything you dislike about cloud computing?

- P20: There is a lack of standards and regulation especially here in South Africa when it comes to cloud computing. That makes it a bit difficult to put your sensitive information on the cloud. Especially us that deal with sensitive customer information. Customers can sue us millions of Rands if they find out that their data was

compromised by us. Some cloud computing applications have advertisements in them which pops up while you're doing something important. That could be a source of distraction and it can affect our productivity if care is not taken.

16. Researcher: What are the issues involved with the deployment of cloud computing?

- P20: Some of the issues to consider are security and privacy issues like data locality, data integrity, data access, data breaches and data segregation.

17. Researcher: Do you have any suggestion on how to avoid or minimise the problems associated with cloud computing?

- P20: Understanding all the security issues and what to do to minimise or eradicate them is important in the reduction or eradication of implementation failure. I would suggest the FSPs do some research about the security issues of cloud computing and how to resolve them before moving to the cloud.

18. Researcher: Do you have a service level agreement in place with your cloud service provider?

- P20: Yes, we have a service level agreement.

19. Researcher: Do you/your employees have the skills needed to use cloud computing effective?

- P20: For technical skills, not really because some of us are not IT savvy. But for the soft skills like managing the service provider relationships, I am very good with that. I am also a bit technically inclined more than my employees.

20. Researcher: Do you know of any legal issues relating to cloud computing?

- P20: No, I have not had any legal issues with regards to cloud computing.

21. Researcher: How confident are you on the safety of your data in the cloud?

- P20: I am confident in our service provider because the are big in the market.

22. Researcher: How supportive are you of cloud computing initiatives?

- P20: I support our cloud computing initiatives a lot.

23. Researcher: Do you have security measures in place to secure your cloud computing environment?

- P20: Yes, everyone has their own username and password to access our cloud computing application.

24. Researcher: Do you have business continuity and disaster recovery (BCDR) plans in place for cloud environment?

- P20: It is provided by the service provider.

25. Researcher: Do you have a cloud computing strategy in place?

- P20: Not at the moment. We have never thought of that, but I think it is a good idea to have one in place.

26. Researcher: Have you defined or measured the business value of cloud computing?

- P20: We have not thought of this either.

27. Researcher: How will you identify the right cloud computing vendor for your business?

- P20: I think the size of the service providers business and the number of years they have been in the market is a good indicator. If they are big and have been in the market for a long time, that could mean that they are doing something right. Otherwise, they should not have a big customer base if they were not keeping the customers happy.

28. Researcher: What are indicators that a cloud computing vendor is trustworthy?

- P20: The quality of service they provide and their level of commitment to the service level agreement goes a long way is showing whether they are trustworthy or not.

29. Researcher: What challenges have you experienced regarding the use of cloud computing?

- P20: The main issue is with the bandwidth. It is so expensive, and we sometimes feel like it's taking our profits away.

30. Researcher: How did you resolve the challenges?

- P20: The challenge is ongoing as the cost of bandwidth is still high.

Researcher: Thank you very much for participating in this research.

8.27 Appendix F21: Interview Transcript of FSP21

Department of Business Administration

Cape Peninsula University of Technology

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The interview transcript – FSP21

1. **Introduction**

- Introduction and greetings
- Purpose of the interview
- Discuss the ethical procedures regarding the data that will be obtained during the interview
- Assure the participants that their information and data obtained during the interview will be kept confidential

2. **Participants' rights**

The participants will be provided with the following information

- The participants may choose to answer or refuse to answer a question
- The participants have the right to decline voice recording
- The participants may request a copy of the research results

3. **Section A: General questions**

1. Name of small and medium enterprise: P21
2. Organisational sector: Financial sector
3. Core business of the small and medium enterprise: Loans
4. Size of the small and medium enterprise i.e. number of employees: 30
5. Number of years in business: 7 years
6. Is the owner/manager directly involved in making IT decision? Yes
7. Does the owner/manager have any cloud computing experience? Yes

Section B:

This section aims assess the cloud computing usage of small and medium enterprises based on the technology, organisation, and environment framework. The participants responses will assist in answering the research questions and contribute towards the development of the proposed framework which will assist small and medium enterprises in their adoption and implementation of cloud computing.

8. Researcher: What is your understanding of cloud computing?

   P21: Cloud computing is the on-demand supply of computer resources by a service provider with no direct management of the resources by the user. The service provider takes care of all the management of the resources.

9. Researcher: Do you think you have the right infrastructure to use cloud computing?

   P21: We have the right infrastructure to use cloud computing. Our phones are also internet enabled and that allows us to be able to also access the cloud using our phones.

10. Researcher: Are you currently using any form of cloud computing?

    P21: We use Gmail for our emails. That's the only form of cloud computing that we use for now because we don't have the technical capacity. But we are working on improving our technical capacity and we are planning to use cloud computing for things like storage, customer relationship management and enterprise resource planning very soon. We are already looking at some cloud applications for our customer relationship management and enterprise resource planning.

11. Researcher: What type of cloud environment does your organisation currently use?

    P21: It's only Software as a Service for now.

12. Researcher: What factors influenced you to adopt cloud computing?

- P21: It assists in cutting costs. I also like the flexibility and availability. Also, cloud computing reduces paperwork since it is online. It therefore helps in saving our planet by reducing the need to destroy trees used in making papers.

13. Researcher: What skills do you require to use cloud computing?

- P21: Computer skills

14. Researcher: What do you like about cloud computing?

- P21: It reduces cost of purchasing hardware and software. It also reduces cost of IT personnel because most of the task that requires IT personnel are done by the third party service provider. It also provides us with disaster recovery.

15. Researcher: Is there anything you dislike about cloud computing?

- P21: The dependency on network connection is boring because it can lead to possible downtime. The loss of control over our data is also not nice. I also don't like the possibility of vendor lock-in because that can be stressful for someone. I like the freedom to be able to change vendors if I am not satisfied with the current vendor.

16. Researcher: What are the issues involved with the deployment of cloud computing?

- P21: Slow data migration is one issue. It took almost a month to migrate all our data to the cloud. Application downtime is another issue due to internet problems. Incorporating or integrating the cloud applications with the existing applications is also an issue that we encountered during cloud computing deployment.

17. Researcher: Do you have any suggestion on how to avoid or minimise the problems associated with cloud computing?

- P21: During migration, I would suggest migration of data in batches to ensure that it will not affect business operations. Getting a reliable internet service provider will also help to reduce the downtime.

18. Researcher: Do you have a service level agreement in place with your cloud service provider?

- P21: We have a SLA with the service provider. I think it essential to have one.

19. Researcher: Do you/your employees have the skills needed to use cloud computing effective?

- P21: There are two of us with the necessary skills, but we assist the other when they have problems.

20. Researcher: Do you know of any legal issues relating to cloud computing?

- P21: None that I am aware of.

21. Researcher: How confident are you on the safety of your data in the cloud?

- P21: I have about 60 percent confidence in the safety of our data stored with the service provider.

22. Researcher: How supportive are you of cloud computing initiatives?

- P21: I am supportive because I know that it can add a lot of value to our business

23. Researcher: Do you have security measures in place to secure your cloud computing environment?

- P21: Yes, we make use of usernames and passwords.

24. Researcher: Do you have business continuity and disaster recovery (BCDR) plans in place for cloud environment?

- P21: Our service provider has back up for all our data.

25. Researcher: Do you have a cloud computing strategy in place?

- P21: There is no strategy in place.

26. Researcher: Have you defined or measured the business value of cloud computing?

- P21: We have not yet defined or measured the business value of cloud computing.

27. Researcher: How will you identify the right cloud computing vendor for your business?

- P21: First using the trial version before adoption is a good option as it will allow someone to determine if the application has all the features and functionalities needed.

28. Researcher: What are indicators that a cloud computing vendor is trustworthy?

- P21: I think they are trustworthy if their existing customers are happy with their service so, trying to find out from the existing customers is a good way to find out.

29. Researcher: What challenges have you experienced regarding the use of cloud computing?

- P21: The problems with Internet connectivity is the only problem that we encounter from time to time.

30. Researcher: How did you resolve the challenges?

- P21: It always get resolved by the service provider.

Researcher: Thank you very much for participating in this research.

8.28 Appendix F22: Interview Transcript of FSP22

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The interview transcript – FSP22

1. **Introduction**

- Introduction and greetings
- Purpose of the interview
- Discuss the ethical procedures regarding the data that will be obtained during the interview
- Assure the participants that their information and data obtained during the interview will be kept confidential

2. **Participants' rights**

The participants will be provided with the following information

- The participants may choose to answer or refuse to answer a question
- The participants have the right to decline voice recording
- The participants may request a copy of the research results

3. **Section A: General questions**

1. Name of small and medium enterprise: P22
2. Organisational sector: Financial Sector
3. Core business of the small and medium enterprise: Loan
4. Size of the small and medium enterprise i.e. number of employees: 14
5. Number of years in business: 12
6. Is the owner/manager directly involved in making IT decision? Yes
7. Does the owner/manager have any cloud computing experience? Yes

Section B:

This section aims assess the cloud computing usage of small and medium enterprises based on the technology, organisation, and environment framework. The participants responses will assist in answering the research questions and contribute towards the development of the proposed framework which will assist small and medium enterprises in their adoption and implementation of cloud computing.

8. Researcher: What is your understanding of cloud computing?

   P22: Cloud computing allow users to store and access data and software over the internet without the need to install the software on own computer.

9. Researcher: Do you think you have the right infrastructure to use cloud computing?

   P22: Yes. We are a small organisation but since cloud computing can be assessed with even the most basic computers. I believe we have the necessary infrastructure to access cloud computing.

10. Researcher: Are you currently using any form of cloud computing?

    P22: Yes. We use Gmail for communication, and we use Goggle drive for storage. We also use Facebook for communication. We are investigating a Cloud application called Zoho which is for invoicing and expense tracking as well as reporting. We will adopt it as soon as we are happy about it.

11. Researcher: What type of cloud environment does your organisation currently use?

    P22: We use both Software as a Service and Infrastructure as a Service.

12. Researcher: What factors influenced you to adopt cloud computing?

- P22: The low cost and high availability is of interest to us. It also improves our creativity as we can work from anywhere at any time.

13. Researcher: What skills do you require to use cloud computing?

- P22: I think anyone that already knows how to use a computer can use cloud computing.

14. Researcher: What do you like about cloud computing?

- P22: It improves systems performance and it is flexible and scalable. It also expands our reach as it allows us to access more customers. It boosts our productivity and promotes collaboration and innovation among us. We are able to access our data and work from anywhere at any time. The infrastructure requirement is low. For example, we don’t need to have our own servers. The service provider owns the servers and we only pay for it when we use it. This makes it cheaper and affordable for us.

15. Researcher: Is there anything you dislike about cloud computing?

- P22: The possibility of external attack which could make our data exposed to unwanted parties. The need for the internet to access cloud computing is also something I hate bout cloud computing. I also don’t like the security and privacy issues about cloud computing.

16. Researcher: What are the issues involved with the deployment of cloud computing?

- P22: The lack of customisation of cloud applications is a problem as it does not make you different from competitors who are using the same application from the same service provider. The integration issues and bandwidth issues are also problems faced during cloud computing deployment.

17. Researcher: Do you have any suggestion on how to avoid or minimise the problems associated with cloud computing?

- P22: It is important to conduct research about the possibility of customisation and integration of the cloud application up front to ensure that the chosen cloud computing application caters for customisation and integration with existing applications.

18. Researcher: Do you have a service level agreement in place with your cloud service provider?

- P22: We do.

19. Researcher: Do you/your employees have the skills needed to use cloud computing effective?

- P22: Most of us have the needed skills and we always opt for training before we start using a new application.

20. Researcher: Do you know of any legal issues relating to cloud computing?

- P22: I don't know of any legal issues about cloud computing.

21. Researcher: How confident are you on the safety of your data in the cloud?

- P22: I think its 50/50. I have confidence but at the same time, anything can happen, and the service provider messes up.

22. Researcher: How supportive are you of cloud computing initiatives?

- P22: I am highly supportive.

23. Researcher: Do you have security measures in place to secure your cloud computing environment?

- P22: The usernames and passwords are the only security measure that we have. They service provider might have other security measures from their side.

24. Researcher: Do you have business continuity and disaster recovery (BCDR) plans in place for cloud environment?

- P22: We do not have any business continuity and disaster recovery plans in place, but I think our service provider caters for that.

25. Researcher: Do you have a cloud computing strategy in place?

- P22: We do not have any cloud computing strategy in place.

26. Researcher: Have you defined or measured the business value of cloud computing?

- P22: We have not defined or measured the business value of cloud computing. We would consider doing that in future.

27. Researcher: How will you identify the right cloud computing vendor for your business?

- P22: For me, word of mouth goes a long way. I would ask people in the same business that are already using the services of that provider. Based on their comments, I would make my decision.

28. Researcher: What are indicators that a cloud computing vendor is trustworthy?

- P22: If a cloud computing vendor can maintain a reasonable percentage of uptime and resolve issues on time. Then, I think they are trustworthy.

29. Researcher: What challenges have you experienced regarding the use of cloud computing?

- P22: The only problem that I can think of is the internet problem. It is expensive for small organisations like our own.

30. Researcher: How did you resolve the challenges?

- P22: I am sometimes able to troubleshoot and resolve the issues myself but, in most cases, we rely on the service provider to come and resolve the issues for us.

Researcher: Thank you very much for participating in this research.

8.29 Appendix G: Cloud Computing Applications used by the participating FSPs

FSP	Cloud Computing service model used	Name of application used	What the application is used for
FSP1	SaaS	SMEasy	Business management and accounting
		Kineto	Electronic accounts, electronic banking and electronic payments
		Sage (Not currently used but under consideration)	Accounting and payroll solution
		Linkedin	Recruitment
		Gmail	Communication and collaboration
		Microsoft Office 365	Office productivity, communication and collaboration
	IaaS	*PointClick*	Storage
	PaaS	None used	N/A
FSP2	SaaS	Gmail	Communication and collaboration
		Yahoomail	Communication and collaboration
		Facebook	Advertisement, communication and collaboration
		Instagram	Advertisement, communication and collaboration
		Twitter	Advertisement, communication and collaboration
		Youtube	Video streaming and advertisement
		AdvanceForce	Customer relationship management
		Pay Space	Payroll and human resources
	IaaS	*Dropbox*	Storage
		Google drive	Storage
		Skydrive	Storage
	PaaS	None used	N/A
FSP3	SaaS	Gmail	Communication and collaboration
		Facebook	Communication and collaboration

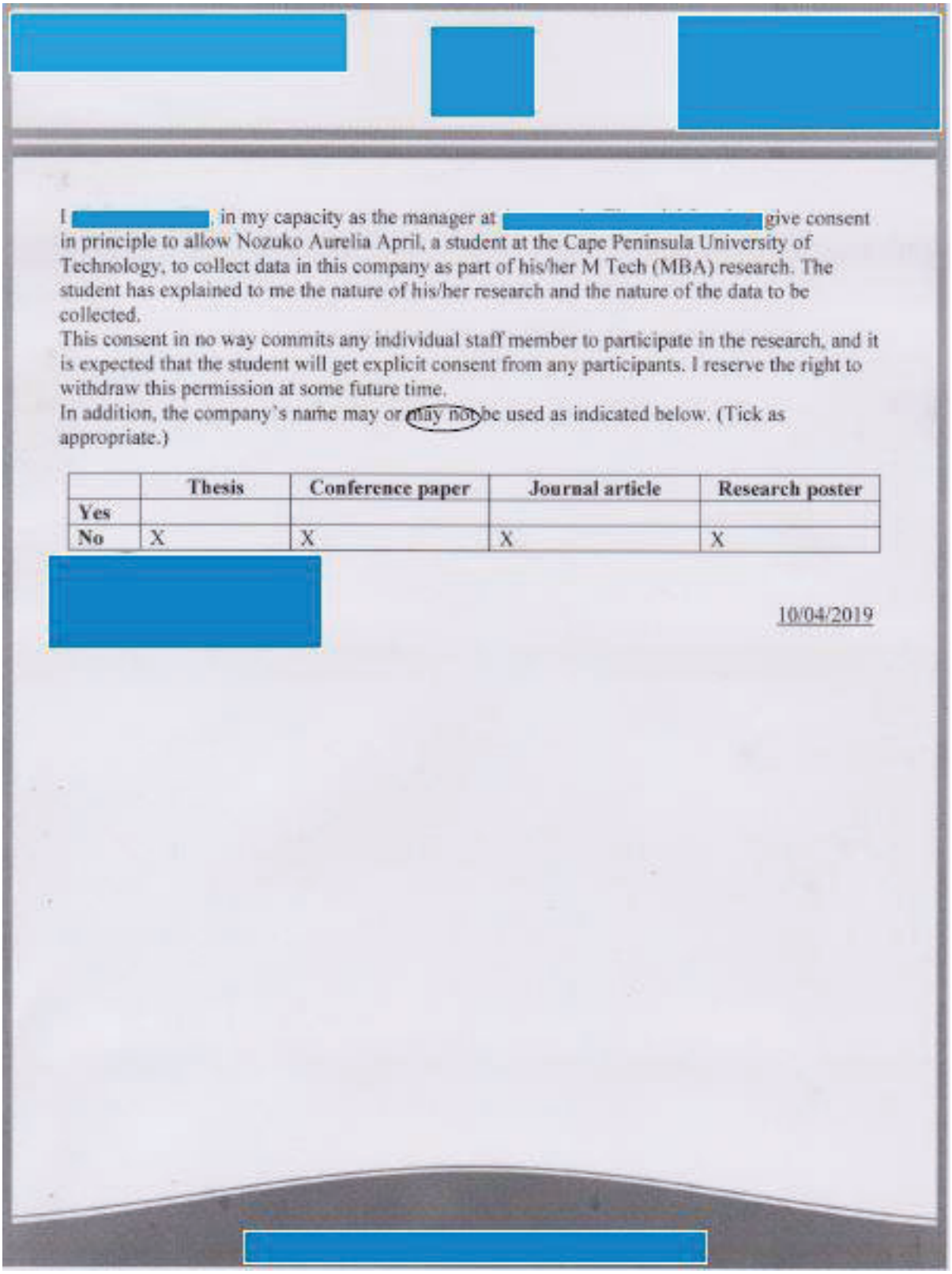
		Skype	Communication and collaboration
		Zuora	Customer invoicing
		Gusto	Payroll and employee benefits
	IaaS	*Google drive*	Storage
	PaaS	None used	N/A
FSP4	SaaS	Gmail	Communication and collaboration
		Yahoomail	Communication and collaboration
		Facebook	Advertisement, communication and collaboration
	IaaS	Google Drive	Storage
	PaaS	None used	N/A
FSP5	SaaS	Gmail	Communication and collaboration
		Twitter	Communication and collaboration
	IaaS	None used	N/A
	PaaS	None used	N/A
FSP6	SaaS	Gmail	Communication and collaboration
		Facebook	Advertisement, communication and collaboration
	IaaS	None used	N/A
	PaaS	None used	N/A
FSP7	SaaS	Gmail	Communication and collaboration
		Yahoomail	Communication and collaboration
	IaaS	Google Drive	Storage
	PaaS	None used	N/A
FSP8	SaaS	Gmail	Communication and collaboration
		Facebook	Advertisement, communication and collaboration
	IaaS	None used	N/A
	PaaS	None used	N/A
FSP9	SaaS	Gmail	Communication and collaboration
		Google App Engine	Website hosting
	IaaS	Google Drive	Storage

	PaaS	None used	N/A
FSP10	SaaS	Gmail	Communication and collaboration
		MTN Webplus	Website hosting
		Zoho	Customer invoicing, expense tracking and reporting
	IaaS	None used	N/A
	PaaS	None used	N/A
FSP11	SaaS	Gmail	Communication and collaboration
		Microsoft Office 365	Office productivity, communication and collaboration
		Kineto	Electronic accounts, electronic banking and electronic payments
		Sage	Accounting and payroll solution
	IaaS	Google Drive	Storage
	PaaS	None used	N/A
FSP12	SaaS	Gmail	Communication and collaboration
		Facebook	Advertisement, communication and collaboration
		Skype	Communication and collaboration
		Youtube	Video streaming and advertisement
		Twitter	Advertisement, communication and collaboration
	IaaS	Dropbox	Storage
	PaaS	None used	N/A
FSP13	SaaS	Facebook	Advertisement, communication and collaboration
		Skype	Communication and collaboration
		Gmail	Communication and collaboration
		Twitter	Advertisement, communication and collaboration
	IaaS	None used	N/A
	PaaS	None used	N/A
FSP14	SaaS	Gmail	Communication and collaboration
	IaaS	Dropbox	Storage

	PaaS	None used	N/A
FSP15	SaaS	Gmail	Communication and collaboration
		Yahoomail	Communication and collaboration
		Twitter	Advertisement, communication and collaboration
	IaaS	None used	N/A
	PaaS	None used	N/A
FSP16	SaaS	Gmail	Communication and collaboration
	IaaS	Google Drive	Storage
	PaaS	None used	N/A
FSP17	SaaS	Microsoft Office 365	Office productivity, communication and collaboration
		Gmail	Communication and collaboration
		Facebook	Advertisement, communication and collaboration
	IaaS	Google Drive	Storage
	PaaS	None used	N/A
FSP18	SaaS	Gmail	Communication and collaboration
	IaaS	None used	N/A
	PaaS	None used	N/A
FSP19	SaaS	Gmail	Communication and collaboration
		Facebook	Advertisement, communication and collaboration
	IaaS	Google Drive	Storage
	PaaS	None used	N/A
FSP20	SaaS	Gmail	Communication and collaboration
	IaaS	Google drive	Storage
		Dropbox	Storage
	PaaS	None used	N/A
FSP21	SaaS	Gmail	Communication and collaboration
	IaaS	None used	N/A
	PaaS	None used	N/A
FSP22	SaaS	Gmail	Communication and collaboration

		Facebook	Advertisement, communication and collaboration
	IaaS	Google Drive	Storage
	PaaS	None used	N/A

8.30 Appendix H: Approval letter from management of one of the participating FSPs



I [redacted], in my capacity as the manager at [redacted] give consent in principle to allow Nozuko Aurelia April, a student at the Cape Peninsula University of Technology, to collect data in this company as part of his/her M Tech (MBA) research. The student has explained to me the nature of his/her research and the nature of the data to be collected.

This consent in no way commits any individual staff member to participate in the research, and it is expected that the student will get explicit consent from any participants. I reserve the right to withdraw this permission at some future time.

In addition, the company's name may or may not be used as indicated below. (Tick as appropriate.)

	Thesis	Conference paper	Journal article	Research poster
Yes				
No	X	X	X	X

[redacted]

10/04/2019

CERTIFICATE OF EDITING AND PROOFREADING

CERTIFICATE OF PROOFREADING AND TECHNICAL EDITING

10 September 2020

Re: **NOZUKO AURELIA APRIL - STUDENT NUMBER: 217289339**

I hereby certify that I have proofread and edited to CPUT's standards and guidelines the thesis titled

MANAGEMENT ISSUES WITH CLOUD COMPUTING: A SMALL, MICRO AND MEDIUM ENTERPRISES PERSPECTIVE USING THE TECHNOLOGY, ORGANISATION AND ENVIRONMENT FRAMEWORK

by the abovementioned student, as supervised by Dr A de la Harpe.

The work was completed and sent to the student and supervisor on 10th September 2020.

Mr J Barnes

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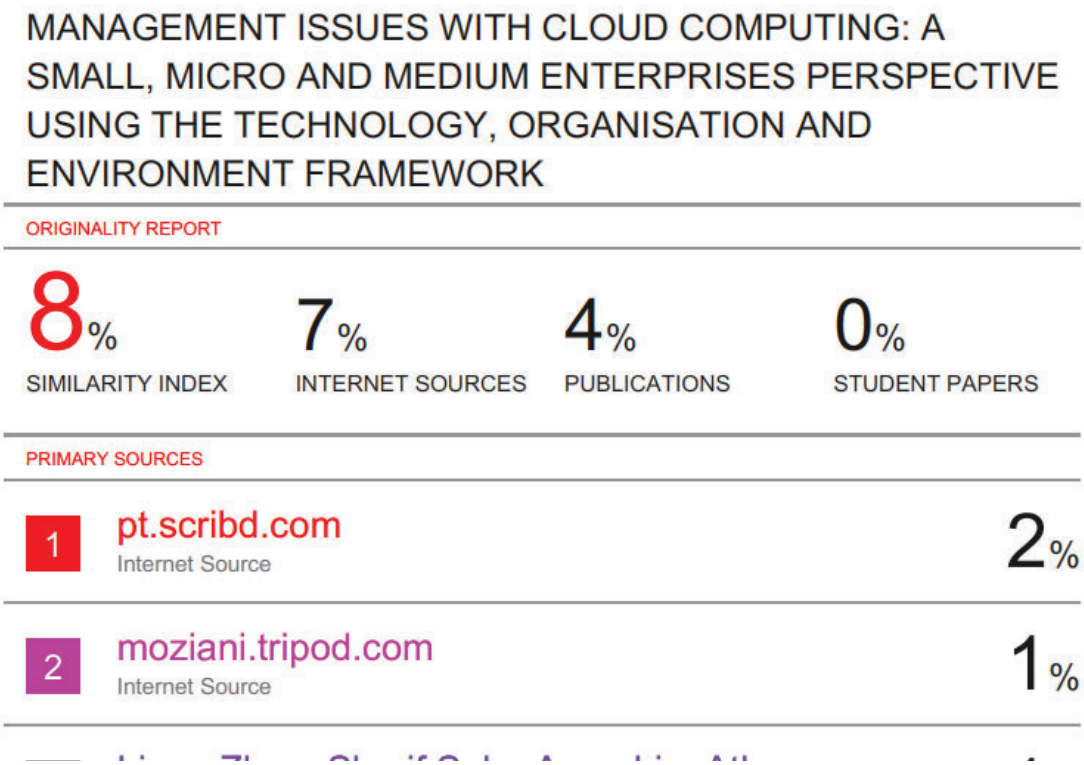

MANAGEMENT ISSUES WITH CLOUD COMPUTING: A SMALL, MICRO AND MEDIUM ENTERPRISES PERSPECTIVE USING THE TECHNOLOGY, ORGANISATION AND ENVIRONMENT FRAMEWORK

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