AN INTEGRATED MODEL FOR CONTINUANCE USE OF CLOUD COMPUTING SERVICES TOWARDS SMEs ORGANIZATIONAL PERFORMANCE

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UNIVERSITI MALAYSIA PAHANG

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Thesis submitted in fulfillment of the requirements
for the award of the degree of
Doctor of Philosophy

Faculty of Computing

UNIVERSITI MALAYSIA PAHANG

JUNE 2020

ACKNOWLEDGEMENTS

All praise be to Allah and may peace and blessings of Allah be upon our prophet, Muhammad and upon all his family and companions. Thanks to Allah who give me good health in my life and thanks to Allah for everything. Without the help of Allah, I was not able to achieve anything in this research.

The completion of this research has been assisted by a generous help of many people of whom I owe a lot of thanks and appreciation.

First and foremost, I wish to express my deepest gratitude to my supervisor, Professor Ts. Dr. Ruzaini Abdullah Arshah, for the continuous support of my PhD study and research, for encouragement, guidance, critics and friendship. Without his continued support and interest, this thesis would not have been the same as presented here.

Additionally, I would like to convey my heartfelt appreciation to the Dean, Assistant Deans, and all the lecturers and staff and colleagues in the Faculty of Computer Systems & Software Engineering (FSKKP), UNIVERSITI MALAYSIA PAHANG (UMP) who were always available to assist, encourage and pray for me throughout the journey. Without your assistance, encouragement and prayer, the journey might have been more difficult and unbearable.

This last part of my acknowledgement I have saved to my ultimate family. To my mother, without her consistent prayer, this work would not have been completed. To my dearest wife, thank you for your love and support throughout the hardship and opulence time of our lives together including throughout the period of this journey, and to my beautiful sons, AbdulGhani, Aiham and Aws, the most precious gifts in my life, your smiles have encouraged me a lot during my study and to be the best that I can be always.

ABSTRAK

Sektor fungsi perusahaan kecil dan sederhana (PKS) adalah satu badan perniagaan utama yang akan mendapat manfaat yang besar daripada perkhidmatan pengkomputeran awan memandangkan cirinya yang fleksibel, *pay-as-you-go* “bayar seperti yang mahu digunakan” dan mengurangkan pelaburan perkakasan. Organisasi yang menggunakan perkhidmatan pengkomputeran awan bagi mengurangkan kos teknologi maklumat dan untuk meningkatkan persaingan boleh mendapat manfaat dari semasa ke semasa hanya jika mereka berterusan menggunakan teknologi ini selepas pelaksanaannya. Penggunaan sistem maklumat yang berterusan adalah sangat penting untuk kelestarian organisasi kerana ia menyediakan kecekapan dan keberkesanan dalam pengurusan transaksi perniagaan. Kajian mengenai faktor-faktor yang menjejaskan penggunaan berterusan teknologi ini masih kurang, terutamanya di peringkat organisasi walaupun telah banyak usaha penyelidikan mengenai penggunaan awal perkhidmatan pengkomputeran awan. Tambahan pula, hubungan antara penerusan penggunaan perkhidmatan pengkomputeran awan dan prestasi organisasi PKS masih belum dikaji. Oleh itu, kajian ini bertujuan untuk merapatkan jurang di dalam literatur untuk menyediakan satu model bersepadu bagi penggunaan perkhidmatan pengkomputeran awan yang berterusan ke arah prestasi organisasi PKS. Model ini dibangunkan dengan menggabungkan model sistem maklumat berterusan (ISCM) dengan rangka kerja teknologi-organisasi-alam sekitar (TOE) di dalam konteks PKS di Malaysia. Sebanyak 15 hipotesis telah dibangunkan untuk menguji pengaruh faktor ISCM dan TOE terhadap keputusan penggunaan perkhidmatan pengkomputeran awan yang berterusan serta kesannya terhadap prestasi PKS. Satu kajian empirikal melalui metodologi kaji selidik telah dijalankan untuk menguji model penyelidikan. Di dalam hal ini, sejumlah 377 soal selidik yang sah diterima daripada pembuat keputusan (pemilik, CEO atau pengurus IT) dari pelbagai sektor PKS di Malaysia yang menggunakan perkhidmatan pengkomputeran awan di dalam aktiviti mereka. Mereka dipilih sebagai sumber data kerana mereka dianggap sebagai individu yang optimum untuk menjawab soalan-soalan yang berkaitan dengan masalah penyelidikan. Oleh itu, *partial least squares structural equation modeling* (PLS-SEM) menggunakan perisian *SmartPLS* digunakan untuk mengesahkan model penyelidikan dan hipotesis yang berkaitan dengan mengatur dua ujian statistikal. Pengujian ini adalah untuk menilai hubungan antara konstruk pendam dan penunjuknya (model pengukuran) serta menilai hubungan antara konstruk dalaman dan konstruk luaran (model struktur). Hasil kajian menunjukkan bahawa 11 daripada 15 hipotesis adalah signifikan dan disokong oleh pemberat > 0.1, nilai $t > 1.65$ dan nilai $p < 0.001$. Oleh itu, hasil kajian ini menunjukkan bahawa kelebihan relatif, keserasian, sokongan daripada pengurusan atasan, penjimatan kos, kepercayaan, sokongan kerajaan dan kepuasan menjadi penentu yang signifikan terhadap perilaku pembuat keputusan PKS di dalam meneruskan penggunaan perkhidmatan pengkomputeran awan. Selain itu, kelebihan relatif dan pengesahan mempengaruhi kepuasan. Hasilnya juga menunjukkan terdapat hubungan yang signifikan di antara penggunaan berterusan perkhidmatan pengkomputeran awan dan prestasi organisasi PKS. Sebaliknya, faktor-faktor lain seperti kerumitan, keselamatan dan privasi, kesediaan IT dan tekanan persaingan tidak mempunyai pengaruh yang signifikan terhadap penerusan penggunaan perkhidmatan pengkomputeran awan. Secara keseluruhannya, model penyelidikan menerangkan varians yang besar (78%) ke atas penerusan penggunaan perkhidmatan pengkomputeran awan, yang jelas menunjukkan bahawa model yang dibangunkan sah dan kukuh. Penemuan kajian ini akan menyumbang kepada literatur sedia ada dengan mengesahkan dan memperluas ISCM dengan rangka kerja TOE serta memberi pelbagai implikasi kepada teori dan amalan kerja dalam konteks PKS di Malaysia.

ABSTRACT

The small and medium enterprises' (SMEs) sector is a major business entity that can significantly benefit from cloud computing services given its flexibility, pay-as-you-go feature and reduced hardware investment. Organisations that adopt cloud computing services as a means of lowering information technology (IT) costs and increasing competitiveness can receive value over time only if they sustained using this technology after implementation. Continuance use of information systems (IS) has become crucial for the sustainability of organisations because they provide efficiency and effectiveness in managing business transactions. Studies on factors that affect the continuance use of this technology have remained lacking, especially on the organisational level, despite numerous research efforts on the initial adoption of cloud computing services. Furthermore, the link between the continuance use of cloud computing services and the SME organisational performance have not been investigated. Therefore, this study aims to bridge the gap in the literature to provide an integrated model for the continuance use of cloud computing services towards SME organisational performance. This model was established by integrating IS continuance model (ISCM) with technology–organisation–environment (TOE) framework in the context of Malaysian SMEs. A total of 15 hypotheses were developed to test the influence of the ISCM and TOE factors on the decision of the continuance use of cloud computing services and their effect on SME performance. An empirical study through a survey methodology was conducted to test the research model. In this respect, 377 valid questionnaires were received from the decision-makers (i.e. owner, CEOs or IT manager) of various Malaysian SME sectors that utilise cloud computing services in their activities. These decision-makers were purposefully selected as sources of data because they were regarded as individuals in the optimum position to answer the questions pertinent to the research problem. Accordingly, partial least squares structural equation modelling (PLS-SEM) using SmartPLS software was utilised to validate the research model and related hypotheses by deploying two statistical tests. These tests include assessing the relationships between constructs and their indicators (the measurement model) and evaluating the relationships between the endogenous latent constructs and exogenous latent constructs (the structural model). Findings show that 11 out of 15 hypotheses are significant and supported (weight>0.1 and t-value>1.65, p-value<0.001). Thus, results show that relative advantage, compatibility, top management support, cost-saving, perceived trust, government support and satisfaction to be significant determinants of SME decision-makers' behaviour on the continuance use of cloud computing services. Moreover, relative advantage and confirmation influence satisfaction. The results also show a significant relationship between the continuance use of cloud computing services and SME organisational performance. Conversely, other factors, such as complexity, security and privacy, IT readiness and competitive pressure, do not significantly influence the continuance use of cloud computing services. Overall, the research model explains the substantial variance (78%) on the continuance use of cloud computing services, thereby clearly indicating that the developed model is valid and sound. Furthermore, the verification of the developed model was done via a multiple-case study by choosing two Malaysian SMEs. The findings of this study will contribute to existing literature by validating and extending the ISCM with TOE framework in the context of Malaysian SMEs and provide various implications to theory and practice.

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LIST OF ABBREVIATIONS

CB-SEM	Covariance based – structural equation modeling
CEO	Chief Executive Officer
CIOs	Chief information officers
CMB	Common Method Bias
DOI	Diffusion of innovation
ECM	Expectation-Confirmation Model
ECT	Expectation confirmation theory
HTMT	Heterotrait-Monotrait ratio
ICT	Information Communication Technology
IDT	Innovation Diffusion Theory
IS	Information System
ISCM	Information System Continuance Model
IT	Information Technology
PaaS	Platform as a Service
PLS	Partial Least Squares
PLS-SEM	Partial Least Squares-Structural Equation Modelling
PU	Perceived Usefulness
RO	Research objectives
SaaS	Software as a Service
SEM	Structural equation modeling
SMEs	Small and Medium Enterprises
SPSS	Statistical Package for Social Sciences
TAM	Technology Acceptance Model
TOE	Technology-organization-environment
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
TRA	Theory of reasoned action
UTAUT	Unified Theory of Acceptance and Use of Technology
VIF	Variance Inflation Factor
SMIDEC	Small And Medium Industries Development Corporation

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CHAPTER 1

INTRODUCTION

1.1 Research Background

Since the late 1990s, information technology (IT) products and services have been adopted by private and public sector organisations given the various benefits acquired from such products and services, thus leading to improve efficiency (Low, Chen, & Wu, 2011). IT innovations have contributed to a sustainable competitive advantage for all types of organisations, thereby driving their economic viability (Porter & Millar, 1985). IT has been typically known to affect the productivity of all types of organisations significantly and play an important role in promoting any business organisation and managing such businesses, especially in the globalisation era. The benefits of IT include reducing the cost of business operations, enabling the development of differentiated features to identify and create (or assist in creating) new products and services, enhancing relations with partners and expanding domestic and international operations to diversify and integrate into other products and services (Porter & Millar, 1985; Simpson, Taylor, & Barker, 2004). The effects of the globalisation era, enhanced by borderless IT, can be experienced by any kind of business organisations (e.g. small and medium enterprises [SMEs]) regardless of its size (Adam & Mohd Nor, 2016). Azadeh and Foroozan (2015) stated that organisations are being forced by the ever increasing local and global competitive intensities to adopt increasingly efficient and effective strategies to manage businesses. SMEs gain competitive advantages, including increasing access to global markets, by incrementally adopting and using IT innovations, such as cloud computing services (Ghobakhloo, Arias-Aranda, & Benitez-Amado, 2011). Mazidah and Burairah (2014) mentioned that the increasing importance of cloud computing services in SMEs is attributed to its role in facilitating the improvement of efficiency and performance in the organisation. This increasing awareness has resulted in a widespread transformation of business service delivery protocols in the last decade, that is, shifting service from traditional methods to electronic methods (Jones, Beynon-Davies, Apulu, Latham, & Moreton, 2011). However, IT services are frequently met by reluctance in SMEs despite their enormous potential to promote efficiency, profitability and performance, thereby inhibiting their adoption and full utilisation (Dahnil, Marzuki, Langgat, & Fabeil, 2014). This condition may be due to the resource poverty suffered by SMEs in comparison with large companies (Alrousan & Jones, 2016). Organisational culture, structure and size are also factors that affect the level of technology adoption in SMEs (Ramayah, Ling, Taghizadeh, & Rahman, 2016). Thus, inhibitors to IT deployment and optimisation in SMEs must be identified and addressed because a comprehensive and appropriate information system is an important component of the success of the overall development of SME development (Zafar, Almaleh, Alshahri, Alqahtani, & Alqahtani, 2015). IT can only add value to organisations when the systems are implemented and used. If a new information system remains unused over time after implementation, then the business will incur the cost of the information system without receiving the benefits (Murugesan, Rossi, Wilbanks, & Djavanshir, 2011).

A powerful and important innovation in the IT history and perhaps possessing the utmost potential for driving the success of SMEs is 'cloud computing'; this technology, or using internet-based technologies to conduct business, is recognised as an important area for IT innovation and investment (Abdollahzadegan, Hussin, Razak, Moshfegh Gohary, & Amini, 2013; Adam & Musah, 2014). Cloud computing services are the phenomena in which computing, information management and storage are performed in a remote location called the 'cloud' (Park, Park, Seo, & Li, 2016). These clouds or remote locations are rented out to business organisations following their requirements, thereby increasing the efficiency of the storage system and reducing the requirement of expenditure of expanding infrastructure in proportion to the increase in information (Yeboah-Boateng & Essandoh, 2014). Cloud computing has been vital in IT services and has already exerted profound impacts on the lives of private citizens and IT professionals. The most important impact may be the technology's capacity to drive flexibility and efficiency in business models (Gupta, Seetharaman, & Raj, 2013; Saedi & Iahad, 2013a) and ability to utilise its pay-as-you-go feature and reduce hardware investment (Abdollahzadegan et al., 2013; Sultan, 2011). Cloud computing is rapidly being adopted in various sectors, such as the public agencies, healthcare sector, education and tourism (Herrera & Janczewski, 2013).

Wu, Lan, and Lee (2013) defined cloud computing as ‘innovative technology with dynamic scalability and usage of virtualised resources as a service through the Internet; this technology is regarded as a potential solution to advancing modern organisations and improving their IT competitiveness and performance’. The public accessibility of cloud computing services leads to the diffusion and adoption of cloud computing services amongst all types of organisations, including SMEs, and across all organisational levels (Stieninger, Nedbal, Wetzlinger, Wagner, & Erskine, 2014) through the advantages, such as IT technical agility and scalability, enhanced business processes and increased enterprise competitiveness. Cloud computing allows SMEs to compete with large companies and offer their products and services through methods that facilitate the delivery of services, reduce costs and ultimately increase profitability (Alshamaila, Papagiannidis, & Li, 2013) and by having a rapid time to reach the market and an improved access to highly scalable technologies with no upfront capital investment (Saedi & Iahad, 2013a). The use of cloud computing services will enable SMEs to avoid investing in high costs involved in establishing IT infrastructure and servicing and maintaining these infrastructures (Ofili, 2015; Sultan, 2011). SMEs that utilized cloud computing services as a means of lowering IT costs and increasing competitiveness can receive value over time if they continue to use the cloud computing service solution after implementation (Alshamaila, Papagiannidis, et al., 2013; Ratten, 2016).

The assessment of the influence of cloud computing services on the organisational characteristics of a company is a complicated task given the lack of adequate methods and tools for such a task (Gajic, Stankovski, Ostojic, Tesic, & Miladinovic, 2014). The continuance use of cloud computing services is, at least in some sense, a new phenomenon, and its long-term effects on organisations may require additional time to be observed; nonetheless, adopting cloud computing has certain consequences that have immediate and significant implications for the organisation (Schniederjans & Hales, 2016). Previous research has provided evidence that adopting IT initiatives including cloud computing services leads to improved performance of processes and of the organisation as a whole. However, the impact of the continuance use of cloud computing services in organisational performance, remains an under-researched area of study, especially in the SME segment (Rodrigues, Ruivo, & Oliveira, 2014). Existing research on the factors that affect the continuance use of cloud computing services has remained limited (Fu & Chang, 2016; Kupfer, Ableitner, Schöb, & Tiefenbeck, 2016; Park et al., 2016). Therefore, the current study is conducted to analyse the extent to which the continuance use of cloud computing service factors identified in previous studies apply in the context of Malaysian SMEs and to examine the effects of this continuance use on the performance of Malaysian SMEs.

This chapter begins with an overview of the research background and the motivation for this study. Then, the background of the problem; problem statement and research gaps in the existing literature are discussed. Moreover, the research aim and objectives are defined in the next section. Afterwards, the significance and the scope of this study are elaborated to concentrate on the research areas. Finally, a brief overview of the contents of each chapter in this thesis is presented in the last section of this chapter.

1.2 Research Motivation

SMEs are recognised as a major contributor to national and global economic development (Ho et al., 2016; Lee & Runge, 2001). However, SMEs remain hesitant to adopt, use and implement novel technologies in their business activities (Adam & Musah, 2014; Lee & Runge, 2001; Ramayah et al., 2016). This reluctance is mostly due to SMEs are faced with fewer resources than other large enterprises which possess the necessary human, financial and technological resources required to infuse technological innovation in their business operation in comparison with SMEs. Perhaps, the resources and frameworks required for cloud computing adoption and usage amongst the large organisations cannot be generalised to SMEs (Ramayah et al., 2016). In addition to resource limitation, the adoption of IT initiatives in general and, cloud computing services particularly, in SMEs can be affected by organizational structure, staff strength, and organisational culture. Therefore, the low acceptance of new technologies may hinder the continuance use of these technologies (Ramayah et al., 2016; Tripathi, 2017). SME decision-makers, stakeholders and influencers must develop and implement new strategic ideas to achieve further advantages in the global market. This new strategy must help SMEs to adopt new required technology (Ramayah et al., 2016).

Considering the global development of IT-based services, cloud computing services has become an important and promising technology (Ali, Warren, & Mathiassen, 2017; Sultan, 2011). Cloud computing services can support all types of organisations, including SMEs' functions, and provide a unified link between the components of an entire business, enterprise, network and industry simultaneously (Senarathna, Warren, Yeoh, & Salzman, 2016; Stieninger, Nedbal, Wetzlinger, Wagner, & Erskine, 2014). SMEs can reduce the total cost of ownership of information systems using cloud computing services and thus lower the financial barrier to acquiring IT systems for organisations. Considering that cloud computing users have no connection with servers, users' hardware requirements are much lower than they would be otherwise, thus reducing cost and maintenance requirements (Hassan, Khairudin, Nasir, Adon, & Azizi, 2015; Yeboah-Boateng & Essandoh, 2014). The flexibility and agility of cloud computing promise numerous benefits at all organisational levels, thereby encouraging their diffusion and adoption system-wide (Stieninger & Nedbal, 2014).

For several years, considerable effort has been devoted to the study of the factors that influence the adoption of cloud computing services on various sectors which range from large organisations to SMEs (Abdollahzadegan et al., 2013; Adam & Musah, 2014; Al-Mascati & Al-Badi, 2016; Alismaili, Li, Shen, & He, 2016; Alshamaila, Papagiannidis, et al., 2013; Gangwar & Date, 2016; Gupta et al., 2013; Low et al., 2011; Lu & Liu, 2016; Rodrigues, Ruivo, Johansson, & Oliveira, 2016; Senarathna et al., 2016; Vidhyalakshmi & Kumar, 2016). Nevertheless, the mere adoption of an innovation by an organisation does not necessarily imply that the innovation is actually being used or adding value to the organisation and its trading partners (Hazen, Overstreet, & Cegielski, 2012; Zhu, Dong, Xu, & Kraemer, 2006). Moreover, numerous studies and reports have demonstrated that expected benefits for the organisations cannot be easily derived from IT innovations at the pre-implementation stage (Hazen et al., 2012; Kupfer et al., 2016).

Continuance use behaviour is the extension of the initial adoption and acceptance phase. Whilst the initial acceptance and adoption is an important first step towards realising IT success, long-term viability of an IT and its eventual success depend on its continuance use rather than first-time use (Ratten, 2016; Wang, Lii, Sy, & Fang, 2008). Organisations that adopt cloud computing services as a means of reducing IT costs and increasing competitiveness can gain value over time only if they continue to use cloud computing service solutions after implementation (Alshamaila, Papagiannidis, et al., 2013; Ratten, 2016).

Previous information system literature has indicated that only a few studies have focused on the continuance use of cloud computing services (Park et al., 2016; Tripathi, 2017). Thus, significant factors that contribute to the continuance use of cloud computing services must be identified and critically examined. Cloud computing services allow SMEs to have sustainable growth and enhanced performance despite the highly competitive landscape. Furthermore, studies on cloud computing service adoption in SMEs in developing countries have remained scarce (Qian, Baharudin, & Kanaan-jebna, 2016; Ross & Blumenstein, 2015).

At present, most studies have focused on 'cloud computing services' and have been devoted to the aspects of adoption and usage, and limited evidence of significant research on the impact of the continuance use on the value created and especially in its impact on an organisation's performance is available. Whilst previous research has provided evidence that adoptiong of Information and Communications Technology (ICT) has led to improved performance of processes and of the organisation as a whole (Gunasekaran et al., 2017; Pinho & Ferreira, 2017), the effect of the continuance use of cloud computing services on organisations has not been sufficiently studied. Therefore, the present study aims to provide a comprehensive understanding of organisation-level continuance use behaviour and investigate the effect of this continuance use simultaneously on the organisation performance within Malaysian SME context. This study can help SMEs maximise the value of cloud computing by identifying the most important factors for continuance use.

1.3 Background of the Problem

In the context of information systems (IS), significant differences are observed between early adoption behaviour and continuance use behaviour (Bhattacherjee, 2001b; Bhattacherjee & Barfar, 2011). In the literature, several theories have studied the factors that affect the pre-adoption of IT innovations, including cloud computing services. As such, several frameworks have been developed (e.g. (Alshamaila, Papagiannidis, et al., 2013; Oliveira & Martins, 2010; Priyadarshinee, Raut, Jha, & Kamble, 2017; Shareef, Kumar, Kumar, & Dwivedi, 2011; Tashkandi & Al-Jabri, 2015a; Valdebenito &

Quelopana, 2019)). However, limited attention has been directed towards examining the post-adoption phase (Bhattacherjee, 2001b; Bhattacherjee & Barfar, 2011; Obal, 2017; Walther et al., 2018). The adoption of IT innovations by organisations does not necessarily imply that these innovations are actually being used or adding value to the organisation and its stakeholders (Hazen et al., 2012; Zhu, Dong, et al., 2006). Moreover, considerable research has demonstrated that the expected benefits of IT innovations for the organisations cannot be easily derived from the early adoption phase (Hazen et al., 2012; Kupfer et al., 2016).

Extant literature has shown that a plethora of continuance use studies has focused their agenda on the individual level in several IT innovations, such as online brokerage (Bhattacherjee, 2001b), social networking sites (Chang & Zhu, 2012; Sun, Liu, Peng, Dong, & Barnes, 2014; Yin, Liu, & Lin, 2015), websites (Lin, Wu, & Tsai, 2005), online shopping (Hozhabri, Raeesi, Nor, Salimianrizi, & Tayebiniya, 2014; Hung, Yang, & Hsieh, 2012; Qin, 2007), mobile food ordering apps (Alalwan, 2020) and E-learning systems (Dağhan & Akkoyunlu, 2016; Ho, 2010; Wu, Tsai, Chen, & Wu, 2006). By contrast, very few studies have developed a model that examines the factors that influence the continuance use of IT innovations at the organisational level in general (Jia, Guo, & Barnes, 2017; Martins, Oliveira, Thomas, & Tomás, 2019; Obal, 2017; Ramayah et al., 2016; Walther et al., 2018; Zhu & Kraemer, 2005) and SME contexts in particular. Given the growing importance of IS continuance use research, the various factors that may affect the continuance use of cloud computing services at the organisational level must be understood (Jia et al., 2017; Martins et al., 2019; Obal, 2017; Ramayah et al., 2016; Rezvani, Dong, & Khosravi, 2017; Walther et al., 2018; Zhu & Kraemer, 2005).

The literature analysis shows that the information system continuance model (ISCM) developed in (Bhattacherjee, 2001b) is the most important model in predicting continuance use intention. However, most prior ISCM-based studies have only focused on the individual level. The continuance use of technology at the individual level differs from that at the organisational level. In this context, the decisions of the continuance use at the individual level are typically taken by individuals (i.e. consumers or end-users), whereas the decisions made at the organisational level are typically taken by decision-makers in these organisations.

The decisions of continuance use in the organisational level may not be influenced by technological factors that are associated with individuals' beliefs only (e.g. perceived usefulness and ease of use). However, the technology–organisation–environment (TOE) framework can be influenced by external factors (e.g. the environmental factors) and internal factors (e.g. organisational factors) (Tornatzky & Fleischer, 1990a); the level of continuance use in the organisational level is significantly controlled by external and internal factors (Ramayah et al., 2016). Thus, the internal and external factors that affect the continuance use of IT innovations, including cloud computing services from the organisational perspective, must be identified and examined.

Despite the various adoption theories in the IS domain, literature has suggested that these theories must combine individual and organisational levels to provide a comprehensive image of the continuance use of IT innovations (Nguyen, Nguyen, & Cao, 2015), where cloud computing services have no exception. Although the ISCM has been widely used to explain the antecedents and consequences of technology continuance use, few studies have integrated this predominant model with organisation-level theories, such as IS success model (Walther & Eymann, 2012; Walther et al., 2018), and transformational leadership theory (Rezvani et al., 2017) to depict innovation adoption and sustained usage, but no study has been integrated between the full TOE framework and ISCM in the context of cloud computing services and SMEs.

In addition, extant findings regarding the effect of IT adoption and use on the performance of organisations are typically inconclusive. This result is due to a few scholars have argued that IT investments do not necessarily lead to improved operational efficiency and effectiveness (Anand, Fosso Wamba, & Sharma, 2013; Irani, 2010; Perez-Mendez & Machado-Cabezas, 2015), whilst other scholars have identified a significant association between the adoption and use of IT initiatives and organisation performance (Gunasekaran et al., 2017; Lo, Wang, Wah, & Ramayah, 2016; Pinho & Ferreira, 2017). Although several studies related to cloud computing services have focused considerably on the aspects of acceptance, adoption and use in relation to individual and organisational perspectives, minimal attention has been paid to the impact of the usage of this technology to create value for the organisations (Martins, Oliveira, & Thomas, 2016; Prasad & Green, 2015; Walther et al., 2015; Walther et al., 2018).

1.4 Problem Statement

Based on the arguments presented earlier and the literature analysis, the following important points have emerged and required further attention: First, several previous pieces of research have studied the factors that affect the pre-adoption of IT innovations, including cloud computing services. However, studies on the post-adoption phase, including the studies on factors that affect the continuance use of cloud computing services have remained lacking. Secondly, the focus of the literature on continuance use has been on the individual level and where an extensive lack of research has been identified of the organisational level. Third, findings regarding the effect of IT adoption on the performance of firms are mostly inconclusive, and the link between the continuance use of cloud computing services and the SME organisational performance have not been investigated.

Considering these gaps in the existing body of knowledge, an integrated model for the factors that predict the continuance use of cloud computing services by the SMEs must be designed and provided. Accordingly, the present study aims to integrate the ISCM (Bhattacherjee, 2001b) with the TOE framework (Tornatzky & Fleischer, 1990) to develop the proposed model. This study also intends to fill the gap in the knowledge by examining the link between the continuance use of cloud computing services and the perceived benefits of this technology by analysing its effect on the SME performance. Therefore, this study proposes the following research questions:

RQ1: What are the main factors that affect the continuance use of cloud computing services?

RQ2: What is the possible integrated model that can examine the factors influencing the continuance use of cloud computing services and what is the effect of cloud computing continuance use on the organisational performance?

RQ3: How to validate the integrated model?

RQ4: How to evaluate the applicability and usability of the integrated model in the SMEs?

1.5 Research Aim and Objectives

This study aims to provide an integrated model for the continuance use of cloud computing services towards SME organisational performance. To accomplish this goal, the key objectives are emphasised as follows:

RO.1: To identify the most important factors affecting the continuance use of cloud computing services at the organisational level.

RO.2: To develop an integrated model of the factors influencing the continuance use of cloud computing services and examine its effect on organisational performance.

RO.3: To validate the integrated model for the continuance use of cloud computing services by SMEs.

RO.4: To verify and evaluate the applicability of the integrated model in SMEs.

1.6 Significance of Study

In terms of cloud computing services in SME research, many studies have investigated different factors that may influence the adoption of cloud computing services. The current study recognises the requirement to outdo conventional studies that have focused mainly on the early stage of adoption by observing the post-adoption stage and studying the factors that affect the continuance use of cloud computing services amongst organisations. Therefore, this study aims to develop an integrated model for predicting the continuance use of cloud computing services in SMEs. The developed research model is regarded as the first that extends the ISCM with TOE framework as an integrated model to study and examine the continuance use of cloud computing services in Malaysian SMEs.

In addition, the apparent reluctance in many SMEs to embrace the new technology suggests that the benefits of cloud computing to SME decision-makers in terms of improving their performance remain largely unclear. Thus, this study is considered the first to examine the link between continuance use and perceived benefits of cloud computing services by analysing their effects on organisational performance.

The outcomes of this study are believed to be interesting for cloud providers, SME decision-makers and researchers. The continuance use of cloud computing services is a vital topic for cloud providers because the revenue model depends on re-subscriptions in their services. The findings of this study can assist cloud computing providers and practitioners to consider the continuance use factors whilst designing and developing cloud services to provide practical guidelines on encouraging SMEs' continuance use of cloud computing services.

In terms of the significance of this study to SMEs, the findings drawn from this study provide decision-makers with a practical understanding of the method through which cloud computing services can enhance the overall organizational performance of SMEs in the context of Malaysia and other regions. The findings drawn from this study provide a road map to SMEs in conceptualising and understanding the importance of the continuance use of cloud computing services to maximise their organizational performance. In addition, these findings reveal that the continuance use of cloud computing services significantly influences SME performance. Consequently, research in this area is significant because the integration of the ISCM with TOE framework factors is considered an unprecedented act. Therefore, future researchers may consider this model, particularly when they are interested in exploring the potential impact of continuance use factors at the organisational level in other contexts.

1.7 Research Scope

The identification of the scope of this study provides a guideline in developing the main aims and objectives of the study and the availability of resources, such as time and money. This study focuses on Malaysian SMEs that utilise cloud computing services in their business activities. Therefore, the unit of analysis is the organisational level. The SMEs involved in this study are organisations with fewer than 200 employees and annual sales turnover of less than 75 million. These parameters were chosen on the basis of the SME definition provided by small and medium industries development corporation (SMIDEC). Further discussion of SMEs in Malaysia will be provided in detail in Section 2.9.

This study adopts the ISCM with TOE framework to explain the continuance use of SMEs that use cloud computing services. Moreover, this study has attempted to extend the ISCM and propose an integrated research model to address ISCM deficiency, that is, its lack of continuance use factors at the organisational level by integrating the ISCM with TOE framework. Furthermore, the link between the continuance use of cloud computing services and the SME organisational performance have been investigated in this study. This study was conducted on the basis of a survey-based questionnaire that targets decision-makers in Malaysian SMEs to achieve the main goal of this study. Data were analysed using SmartPLS (V. 3.2.7) and SPSS (V. 25).

1.8 Organization of the Thesis

This thesis is organized and presented in seven chapters. This section provides an overview on how the chapters of this thesis are structured. An overview of each of the chapters is briefly outlined below:

Chapter 1, Introduction, this chapter provides the background of the current research and motivation, problem statement, research aim and objectives, significance of study, research scope, and thesis organization.

Chapter 2, Literature Review, in this chapter a general background of the research in cloud computing services is presented. It discusses the adoption and continuance use concepts along with the review of Information Systems Continuance Model (ISCM) and prior studies on the continuance use. Chapter 2 also identifying the Technology-Organization-Environment Framework as a dominant theory of the organization level adoption and justifying the reasons the select of TOE in this study. In addition, it introduces cloud computing and investigates the current state of cloud computing adoption in the SMEs by reviewing the factors that influencing the continuance use of cloud computing services in organization level. The literature review also includes reviews of SMEs and their characteristics, significance, and organization performance definition and measurement.

Chapter 3, Research Methodology, the third chapter explains the methodology used in this research. This chapter describes the research design. The operational research framework that details the steps and activities involved throughout the research is also developed. This chapter also justified the unit of analysis. Moreover, the sampling design including the way of collecting data from target participants, sampling technique, selection criteria and justify sample size are also denoted, and justified. Also, the instrument development process and validation are discussed. It also describes the data preparation process, descriptive analysis, and justify the use of partial least squares structural equation modeling (PLS-SEM).

Chapter 4, Structural Model Development and Hypotheses, this chapter presents the process of model development and hypotheses formulation. The building blocks of the model development contains factors extracted in Chapter 2 and validated through a semi-structured interview with experts. The findings are then integrated with the ISCM to help identify the key factors of cloud computing services continuance use. As a result, the research hypotheses are generated and a final an integrated model of cloud computing services continuance use is developed.

Chapter 5, Questionnaier Development and Model Development and Pilot Study, this chapter presents the process of survey instrument development and reports the reliability and validity tests' results. This main aim of this chapter was achieved by a systematic three-step process include defining theoretical constructs and items creation, instrument reviewing process, measurement reviewing process, and measurement testing.

Chapter 6, Results and Discussion, this chapter analyses the final data and validate the measurement and structural model using SPSS software and SmartPLS 3.0. Then, in-depth discussion for the overall findings of the study was provided. The findings are integrated with supporting literature to help identify the key factors of cloud computing services continuance use. The model verfication has been done through two case studies in Mslaysian SMEs context.

Chapter 7, Conclusion, Implications and Future Research, this is the final chapter of the study, it provides an overall concluding of the study contributions and how each of the research objectives was addressed within the thesis. This chapter also acknowledges the limitations of the current research and hence sets out recommendations for future research, outlining the possible directions.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter reviews, analyses, and critiques the prior studies of the cloud computing services adoption and use, as well as their effect on organizational performance with aims of focusing on SMEs context. In this chapter the author first explains an overview about cloud computing and literature streams in cloud computing. Following this, definitions information technology adoption and its concept is discussed. Theories of adoption in IS such as Technology, Organization, Environment framework (TOE) (Tornatzky & Fleischer, 1990a) is criticized and justified the reason of selection. Review the prior studies on information technology continuous use to understand the current situation of the topic. Then, previous research on cloud computing services adoption in general and particularly in SMEs context is discussed. In addition, SMEs' definition, characteristics, barriers of growth, and SMEs Malaysian sector are explained. Finally, the last part presents, definitions of organizational performance, measurement, and the relationship between the use of IT and organizational performance. These sections are used as the building blocks to help conceptualize an integrated model for continuance use of cloud computing services and its impact on Malaysian SMEs performance. Therefore, this chapter will achieve the first research objective of this study. The main structure of review in this chapter showen in Figure 2.1.

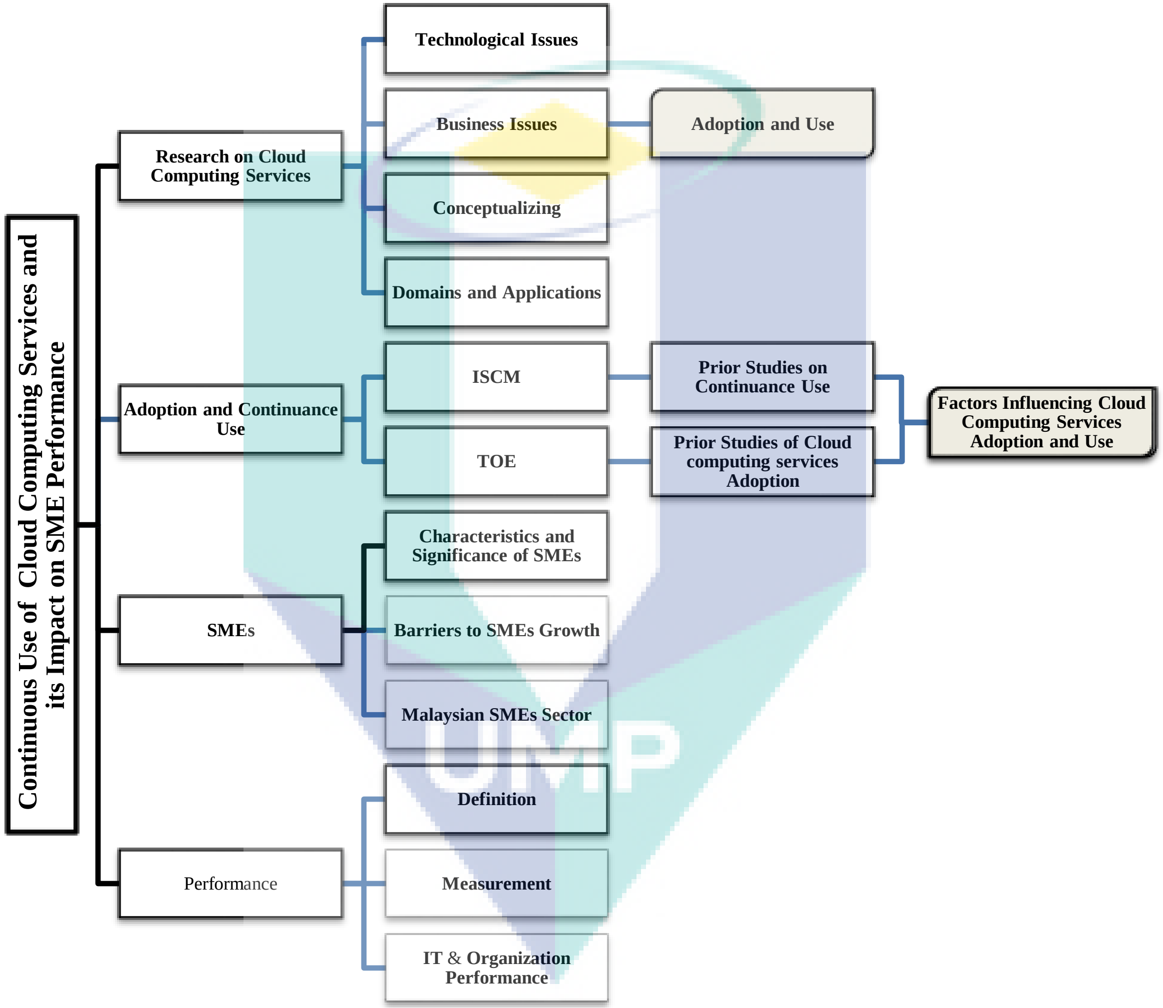

Figure 2.1 Main Structure of Literature Review

2.2 Background of Cloud Computing Services

When faced with a troubling situation, the merging of IT with both tangible and/or intangible resources can provide the best solution towards enhancing the performance of organizations and attaining a competitive advantage (Pinho & Ferreira, 2017). Cloud computing has developed as a technological trend for IT usage modification in a competitive manner. Cloud computing provides the opportunity of locating network resources in a virtual environment where it can be accessed base don demand via web-enabled devices. Cloud computing has provisioned IT by combining "Internet connectivity and pay per use systems in a new business model" (Maqueira-Marin, Bruque-Camara, & Minguela-Rata, 2017). According to Al-Shafi & Bahar (2016), Cloud Computing services is considered an aspect of Information System.

Currently, there is no universal or standard definition of cloud computing serveces (Oliveira, Thomas, & Espadanal, 2014; Rountree & Castrillo, 2014; Tashkandi & Al-Jabri, 2015), but for the sake of this work, the definition provided by NIST (Mell & Grance, 2011) was adopted, where cloud computing was defined as "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) which can be rapidly provisioned and released with minimal management effort or service provider interaction".

Individuals and organizations can be provided with computing services via cloud computing (Alshamaila, Papagiannidis, et al., 2013; Low et al., 2011; Stieninger et al., 2014). On the individual scale, cloud computing refers to the capability of an individual to access web-based email, sharing files from person to person, accessing social media platforms, sharing photos, etc. Hence, cloud computing requires the user to pay for the actual computing services he/she uses. Even though several providers of cloud computing service deploy the subscription-based packages, others may decide to provide the service at no cost. Among the cloud computing services offered include email services by large firms such as Google, Microsoft, and Yahoo, social networking platforms such as Twitter, Facebook, LinkedIn, MySpace, etc for storing personal data, as well as hosting services as offered by Google. Cloud services also improve economic value for companies that may wish to move their businesses activities to cloud by saving them from the cost of software and hardware (Abdollahzadegan et al., 2013). Based on the real-time demands of a business, the providers of cloud computing service can lease their services such as hardware and software (Yeboah-Boateng & Essandoh, 2014) such that organizations can decide to subcontract their computing requirements by only paying for only the access charges to such software and hardware. This could reduce cost associated with the use of IT infrastructure and the need for personnel to maintain the IT resources (Alismaili, Li, et al., 2016b; Park et al., 2016). Some of the known cloud service providers who can lease their services to various organizations include "Microsoft Azure, Google Cloud Platform, Amazon Web Services, Verizon Cloud, and IBM Cloud".

There are 3 basic types of cloud computing service delivery models, these are "Platform-as-a-service (PaaS), Software-as-a-service (SaaS), and Infrastructure-as-a-service (IaaS)" (Alismaili, Li, et al., 2016b; Böhm, Leimeister, Riedl, & Krcmar, 2011; Mell & Grance, 2011; Vidhyalakshmi & Kumar, 2016). Regarding the PaaS model, the user can order applications on cloud infrastructures he/she has already formed or on acquire applications he/she has created using the provided tools and "programming languages" by the cloud service providers (Mell & Grance, 2011; Rountree & Castrillo, 2014). For the SaaS model, the applications used by the users are hosted in the central cloud; several client devices can access such application via a thin client interface such as mobile applications or web browsers. With this arrangement, the user has no need for installing software on their devices. This cloud service model is beneficial as it offers centralized hosting and configuration, updating of the currently released software versions without any form of installation, as well as faster feature delivery (Martins et al., 2016; Mell & Grance, 2011; Oliveira et al., 2014). For the IaaS model, the basic computing resource units, such as network, processing, and storage are exclusively hosted on the cloud and can only be accessed on-demand (e.g., "Amazon Web Services offer EC2 computing platform, and S3 storage platform services")(Böhm et al., 2011; Mell & Grance, 2011; Oliveira et al., 2014). Individuals and businesses can benefit from cloud computing services to facilitate their business (Alshamaila, Papagiannidis, et al., 2013; Low et al., 2011; Stieninger et al., 2014).

According to Mell and Grance (2011), cloud computing services are characterized by 5 major characteristics, which are "on-demand self-service, measured service, broad network access, rapid elasticity, and resource pooling". On-demand self-service facilitates the use of the service without actual interaction with the service provider. A user can be aware of the cloud situation by changing network server time or network storage from the net. Regarding measured service, the usage of the network resource is controlled, monitored, and reported in a bid to ensure transparency on either side of the service. This characteristic of the cloud makes it possible for cloud users to use cloud service in a "pay as you grow" model and for internal IT departments to have IT chargeback capability (Oliveira et al., 2014). Broad network access implies the availability of capabilities within a network and users can access it via their devices. Rapid elasticity implies that network capabilities can be elastically and automatically provisioned and released. Such capabilities can be altered to suit the demands of a consumer at will. Resource pooling means the capability of the provider to pool resources from different segments in order to serve multiple consumers through several physical and virtual resources which can be assigned and reassigned to suit customers' demands. The customer cannot directly connect directly to the network resources but is aware of its geographical location (Mell and Grance, 2011).

Chang, Walters, and Wills (2016) stated that the understanding of organizational adoption of cloud computing service is not only technically challenging but also causes organizational problems in the form of costs, users and other organizational-related issues. The existing literature considered not only the analysis of the associated risk and returns status following cloud computing adoption in organizations, most of the researchers such as Oliveira et al. (2014), Hsu and Lin (2015), Ratten (2015), Yuvaraj (2016b), and Akar and Mardiyan (2016) strived to address the trade-off between technical and business demands and also tried using the already existing cloud computing services adoption models.

Figure 2.2 gives an overview of the literature streams in cloud computing services based on Wahsh and Dhillon (2015b); Yang and Tate (2012). Works on cloud computing mainly focus on structuring the academic field of IS while other terms coined are cloud computing services acceptance, assimilation of cloud computing, migration to cloud computing services, and continuance use of cloud computing services (Gangwar, Date, & Ramaswamy, 2015; Gholami, Daneshgar, Low, & Beydoun, 2016; Hew & Kadir, 2016; Park et al., 2016).

According to Yang and Tate (2012), technological issues refer to cloud computing technology as a white-box where the researchers focus on cloud computing components and mechanism. Business issues related to cloud computing as a black-box where the research focuses on which can generate business value to both providers and users. Conceptualizing cloud computing contains articles that provide general aspects of cloud computing. Domains and applications consist of articles which discuss the impact of cloud computing on particular domains or contexts.

Reviewing the existing research in the area of cloud computing provides suggestions for further research that relates to cloud computing adoption, acceptance and continuance use (Bayramusta & Nasir, 2016; Motta & Sfondrini, 2011; Yang & Tate, 2012). This study discussed the factors that affect organizations to continuance use of cloud computing services and implications of continuance use of this technology on their performance, focusing primarily on the context of SMEs in Malaysia.

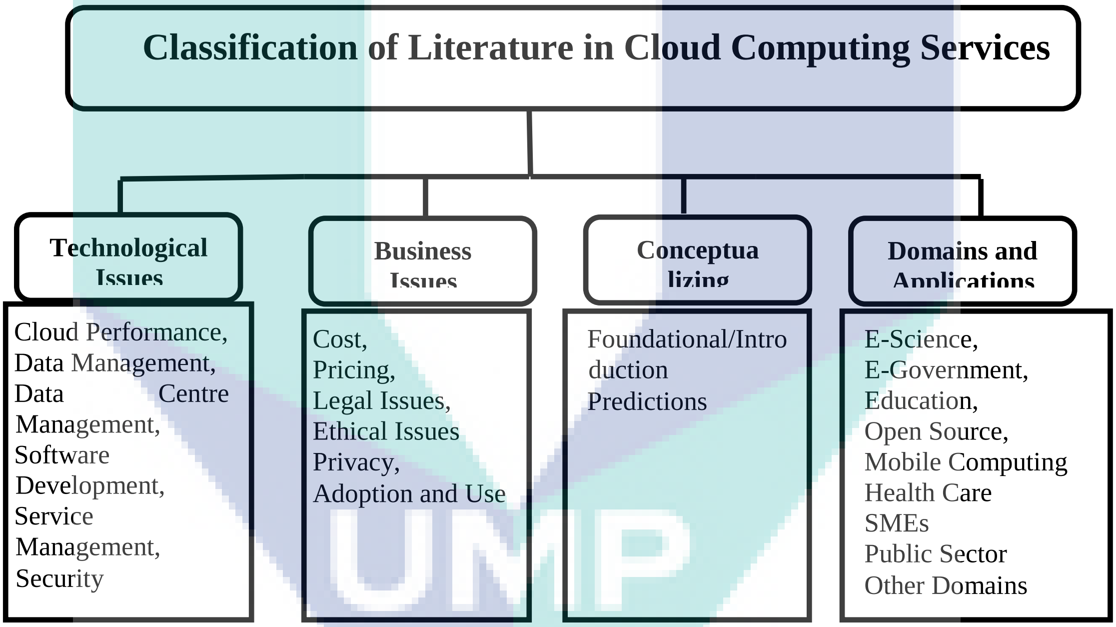

Figure 2.2 Classification of literature in cloud computing services
Adopted from: Wahsh & Dhillon, (2015) ; Yang & Tate, (2012)

2.3 Adoption and Continuance Use

There are significant differences between the early adoption behavior and continuance use behavior in the context of IS. The term ‘adoption’, as per Saya, Pee, and Kankanhalli (2010), is defined as accepting and starting to use something new. In terms of technology adoption, Rogers (2003) defined adoption as “a decision to make full use of an innovation as the best course of action available". In the organizational context, adoption is related to admitting the implementation of a new innovation (Deering, Tatnall, & Burgess, 2012). For many organizations, the continuance usage adoption or user retention is essential for guaranteeing the long-term profitability of these organizations. Several studies exist on technology adoption. The consideration of technology adoption as a process started with Rogers (1962) with the introduction of a model with 5 adoption stages. Following this feat, several versions of the model have been reported in IS literature (e.g. Ettlie, 1980; Fichman & Kemerer, 1997; Salim, Sedera, Sawang, & Alarifi, 2014). Fichman and Kemerer (2012) suggested the term 'technology adoption' to portray a wide range of events, starting from the technology awareness to its general utilization in the organization. This perspective aligns with the wider aspects of technology adoption which includes the pre-adoption, adoption, and post-adoption stages as earlier discussed in the literature (e.g. Aguirre-Urreta & Marakas, 2012; Schwarz, Chin, Hirschheim, & Schwarz, 2014). Some studies, however, have deployed a 4-phased adoption process that consists of initiation, adoption, decision, and implementation (e.g. Pierce & Delbecq, 1977; Rogers, 1962; Zmud, 1982).

Following the discussion of adoption stages in several studies (e.g. Ettlie, 1980; Guo & Barnes, 2011; Verville & Halingten, 2003), as well as the variations in the adoption stages which ranges from 5 (e.g. Shoham, 1992) to 7 (e.g. Mintzberg, Raisinghani, & Theoret, 1976), it has been unanimously agreed that the 5 technology adoption stages are (i) "*awareness / need identification / knowledge, (ii) interest / information search / product brokering, (iii) evaluation / selection / negotiation, (iv) trial / choice / decision, (v) commitment / purchase / implementation / adoption"*. As per Obal (2017), user adoption and usage of innovation come much later than the initial adoption decision at the organizational level.

As per (Teo, Wei, & Benbasat, 2003), there are two primary approaches in the continuance use literature that focus on psychological motivations leading user's intention to continuance use of IT initiatives. In the first approach, continuance is considered an extension of the first adoption stage; this form of model suggests the initial changes in the perception of IT initiative usefulness as a consequence of technology use (Walther et al., 2018). It is then believed that these revised perceptions influences the choice to future use of a system. Many scholars have based on this approach to study numerous aspects of human perceptions to technology from different theoretical standpoints, including Theory of Planned Behavior (TPB) (Roca, Chiu, & Martínez, 2006), Technology Acceptance Model (TAM) (Hong, Thong, & Tam, 2006), Task-Technology Fit (TTF) (Yang & Lin, 2015), Theory of Reasoned Action (TRA) (Lee, Choi, & Kang, 2009), and Unified Theory of Acceptance and Use of Technology (UTAUT2) (Alalwan, 2020). From the organizational level, few papers have examined the continuance use. For instance, Ramayah et al. (2016) extended the TOE framework with CEOs characteristics to examine the website continuance intention from the SMEs perspective, while Obal (2017) addressed the continuance adoption intentions of disruptive technology from the perspective of 211 organization managers.

The problem of this approach is it uses the same set of beliefs or motivations to explain both acceptance and continuance decisions, viewing continuance as just a mere extension of acceptance and initial adoption (Bhattacherjee, 2001a; Bhattacherjee, 2001b). Additionally, this approach lacks the means to facilitate measuring the changes in the IS system throughout the implementation stages.

The second approach depends on the "expectation disconfirmation theory" (Oliver, 1977) which posits that future usage is determined by the variations between the expectations of a user from an IS and what was actually delivered (Bhattacherjee & Premkumar, 2004). This approach predominantly concentrated on post-adoption factors because it posits that "the effects of initial-adoption factors are already captured within the confirmation and satisfaction constructs" (Bhattacherjee, 2001b). The focus of this approach is on the continuance use of technology innovation at the individual level; however, the focus of this study is on the continuance use of cloud computing services at the organization level. The continuance use of technology differs at both organizations and individual levels.

Most of the continuance use research has focused on the individual level (both consumers or end-users) while organizational continuance decisions are solely the responsibility of the decision-makers in the organization who may not be the end-users of this innovation. The continuance use decisions at the organizational level can be influenced by several factors (both external and internal), such as the adjustment of the changes in a strategic direction or responding to external pressures to minimize costs and gain competitive advantage. Additionally, the continuance use decisions of certain innovation in the organizational level must consider the embedded nature of existing systems, as well as the wide range of issues that could arise from total dependence on the system for routine business activities. The decision to adopt a new technology at the organizational level may not be influenced by technological factors that are associated with the individuals' beliefs only (like perceived usefulness and ease of use), but as per the TOE framework, it can be affected by both external factors (like the environmental factors) and internal factors (like the organizational factors) (Tornatzky & Fleischer, 1990a).

The level of continuance use of new technology is significantly controlled by both external factors (such as technological characteristics) and environmental characteristics (Ramayah et al., 2016). Thus, there is a need to supplement the critical factors at the organization level for the continuance use of technology, especially from the organizational perspective. Based on the above discussion, the current research tries to integrate between these two approaches to theorize an integrated model for the examination of the factors that militate the "continuance use of cloud computing services" at the organizational level. Regarding this research, the "continuance use of cloud computing services" refers to the acceptance and continuance use of this technology in SMEs.

2.4 Information Systems Continuance Model

Since there are significant differences between the early adoption behavior and continuance use behavior in the context of IS, the Information Systems Continuance Model (ISCM) was developed and empirically validated to study the behavior of continuance use of IS by consumers (Bhattacherjee, 2001b). The ISCM is one of the most widely used models for evaluating information system continuance; it was developed by Bhattacherjee (2001b) based on the Expectation Confirmation Theory (ECT) (Oliver, 1977) and has been widely used to investigate IT innovations continuance use using satisfaction and confirmation as constructs. The ISCM was developed to understand the drivers for continuance use of information systems initiatives. According to Rogers (2003), the decision to continue or discontinue the use of IT innovations after adoption and implementation is the final confirmation stage in which a user reassesses the decision to use these technologies.

In the ISCM and ECT, as shown in Figure 2.3 and Figure 2.4, the construct of expectations in ECT was replaced by post-usage perceived usefulness while the performance construct of ECT was eliminated since ISCM assumes the influence of perceived performance has already been covered by the confirmation construct. Furthermore, the ISCM renamed "repurchase intention" as "continuance usage intention". The ISCM attempts to explain the users' intention to continuous use of IS initiatives following the initial adoption phase. The ISCM only focuses on the factors that affect the post-adoption stage from the individual perspective. The initial adoption factors were not considered since they have already been captured in the "pre-adoption confirmation and satisfaction constructs".

The ISCM hypothesized that the degree of satisfaction of an individual depends on the level of confirmed expectations and their perceived usefulness on the part of the individual, while an individuals' continuance use of an innovation is dependent on his/her level of satisfaction and its perceived usefulness (Bhattacherjee, 2001b). Therefore, to improve the understanding of the continuance use of cloud computing services at the organization level, this study hypothesizes that SMEs' degree of satisfaction with cloud computing services is determined by the level of their confirmed expectations and their relative advantage, while their continuance use of cloud computing services is determined by their degree of satisfaction and their relative advantage.

The ISCM has been applied in the study of several IT innovations, such as social networking sites (Yin et al., 2015), enterprise systems (Jia et al., 2017; Rezvani, Dong, & Khosravi, 2017), website as a business innovation (Ramayah et al., 2016), and E-learning systems (Dağhan & Akkoyunlu, 2016; Wu et al., 2006). However, research on the continuance intention of technology at the firm level is still limited. To enhance the explanatory power of the ISCM, some studies have integrated it with other theories; for instance, Jia et al. (2017) extended the ISCM with the organizational perspective to predict the determinants of enterprise 2.0 post-adoption.

Figure 2.3 Information Systems Continuance Model
Source: Bhattacherjee, (2001b)

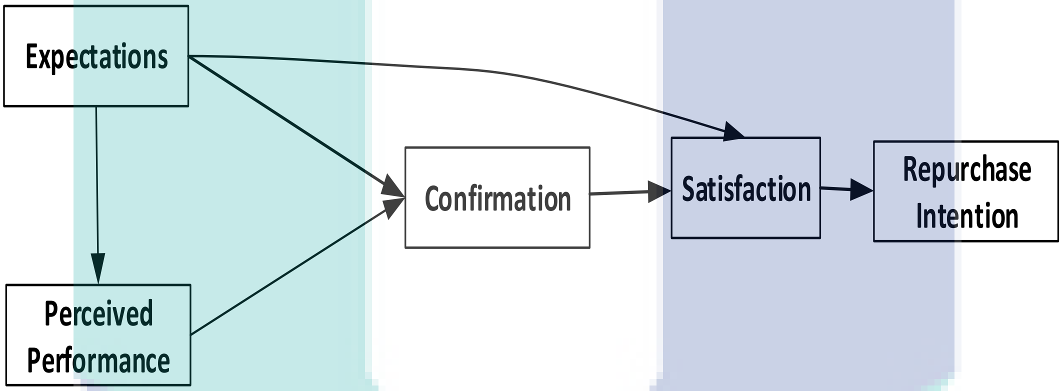

Figure 2.4 Expectation Confirmation Theory
Source: Oliver, (1977)

In the case of cloud computing services, the importance of continuance use is important for the consuming organization to be aware of the potential gains from their investment. Technology providers will also benefit from improved revenue opportunities for maintenance and upgrades. Cloud computing services providers benefits the most from continuance use since revenue is generated mainly from transaction fees or service subscriptions.

2.5 Prior Studies on Continuance Use

In line with Table 2.1, the previous works on continuance use of IT innovations have been analyzed. This literature analysis was conducted to give a better understanding of the state of research related to this topic. Based on the literature analysis, it was observed that some models have been put forward to explain the continuity of the IT innovation use behavior in different contexts; however, each model differed significantly from the other. Importantly, it was observed that most researchers generally used either single or mixed models and theories (Benlian, Koufaris, & Hess, 2011; Bhattacherjee, 2001b; Hong et al., 2006; Lin et al., 2005; Walther et al., 2018).

The literature analysis showed that the ISCM developed by (Bhattacherjee, 2001a) is the most important model in predicting continuance use intention. However, some other models and theories, such as ECT, TAM, TRA, IDT, UTATU2, TRA, and Positive Mood Theory have also been used (Alalwan, 2020; Benlian et al., 2011; Bhattacherjee & Premkumar, 2004; Ha, 2006; Hong et al., 2006; Joia & Altieri, 2018)). Besides, the ISCM has also been integrated with other theories like DeLone & McLean (Walther & Eymann, 2012), transformational leadership theory (Rezvani et al., 2017), social capital theory, UTAUT (Sun et al., 2014), and TAM (Chong, 2013). Thus, it is interesting to note that the popularity of the ISCM is increasing as compared to the other models and theories.

In this regard, (Bhattacherjee, 2001b) highlighted that ISCM is the widely accepted model among all the models and theories that examined the continuance intention of IT. Additionally, the ISCM model is also applicable in examining the IT innovations continuance. However, the focus of this theory is on the continuance use of technology innovation at the individual level. Being that the ISCM model is not comprehensive enough on continuance intention at the organizational level, it should be further developed to provide a clearer comprehension of "continuance intention at the organization level". Furthermore, the ISCM should be incorporated with other factors in order to be considered an alternative theoretical approach for the provision of an improved explanation on the IT continuance intention (Bhattacherjee, 2001a; Bhattacherjee, 2001b; Bhattacherjee & Barfar, 2011). Additionally, researchers have argued that in future, scholars should improve the model in order to measure the continuance intention by adding external factors; in this regard, many studies have suggested new constructs to be incorporated into the original ISCM to extend the model, and in order to better explain continuance intention (Alraimi, Zo, & Ciganek, 2015; Hsu, Chang, & Chuang, 2015; Kim, Kang, & Jo, 2014).

Among the easily accessed IS literature on post-adoption or continuance use, it was found that only a few studies examined the motivations and/or analyzed the factors that affect the continuance use of IT initiatives at the organization level. For instance, (Jia et al., 2017) extended ISCM with four constructs from the organizational context (organization size, organization scope, subjective norms, and competitive pressure) to examine the determinants of E2.0 continuance use. The research findings showes subjective norms and competitive pressure to significantly affect the Chinese enterprises' intentions to renew their E2.0 service (Mingdao) as the perceived usefulness and satisfaction of the constructs were no longer the strongest predictors of continuance use. Another study in the organization level by (Obal, 2017) investigated the negative and positive antecedents of disruptive technology continuance adoption intentions.

Besides that, it is still necessary to present a more integrative and comprehensive model which can provide a better understanding of the continuance intention of IT innovations at the organization level compared to the existing models (Jia et al., 2017; Martins et al., 2019; Obal, 2017; Ramayah et al., 2016; Walther et al., 2018; Zhu & Kraemer, 2005).

The major weakness of the original ISCM is its lack of internal and external factors that organizations can consider when deciding to continue or discontinue a certain technology in their activity. The extended ISCM model can be useful for scholars and practitioners in the IT continuance use in general and cloud computing service continuance intention in particular. Based on the reasons derived from the existing literature, this study intends to extend the ISCM model with factors that may affect the organizations' continuance use of cloud computing services.

Table 2.1 Related Empirical Research of IS Continuance Use

Reference	Level of analysis		Theory/ Method	Analysis Tools and Sample size	Constructs	Main Findings
	Org	Indiv				
(Walther et al., 2018)	√		Extending IS success model with discontinuance model; Cloud Enterprise Systems; Empirical study	PLS-SEM	continuance forces: System quality; Information quality Net benefits continuance inertia: Technical integration; System Investment	The results show that continuance intention can be predicted both by socio-organizational (net benefits) and technology-related factors (system quality and information quality), explaining 55.9% of the dependent variable's variance.
(Benlian et al., 2011)	√		ISCM / software-as-a service (SaaS); Empirical study	Instrument Development	SaaS Quality Satisfaction, Perceived Usefulness, and Continuance Intention	
(Ratten, 2016)	√		Social cognitive theory; Cloud computing services; Empirical study	SPSS 142 Managers of Australian technology organisations	Personal attitude; Perceived behavioural control; Risk; Innovativeness; Creativity;	Personal attitude was found to be the most important factor.
(Bhattacherjee, 2001b),		√	ECT, ISCM; Online brokerage; Empirical study	SEM + EQS; 1000 online bank users	Confirmation, Satisfaction, Loyalty Incentives, Perceived Usefulness, and Continuance Intention	This research made the distinction between IS acceptance and IS continuance. It also proposed an extension of the ISCM model.

Table 2.1 Continued

Reference	Level of analysis		Theory/ Method	Analysis Tools and Sample size	Constructs	Main Findings
	Org	Indiv				
(Bhattacherjee, 2001a)		√	TAM, Agency theory, ISCM; Online banking; Empirical study	SEM+ LISREL; 172 online and offline investors	Confirmation, Satisfaction, Perceived Usefulness, and IS Continuance Intention	This research concluded that confirmation of expectation had a direct effect on perceived usefulness and satisfaction while the combination of loyalty and perceived usefulness is a key factor for continuance intention.
(Hayashi, Chen, Ryan, & Wu, 2004)		√	ISCM; E-Learning Systems; Conceptual Model	CFA + MANOVA & ANOVA; 110 students in the USA	Confirmation, Satisfaction, Computer Self-Efficacy, and IS Continuance Intention	No significant relationship was found between computer self-efficacy, perceived usefulness, confirmation, and satisfaction in this research.
((Bhattacherjee & Premkumar, 2004)		√	ECT; Computer-based training; Longitudinal Empirical and Qualitative study	CFA; PLS-SEM; 189 Students	Confirmation, Perceived Usefulness, Satisfaction, Attitude, and Continuance Use Intention	The research examined both the antecedent variables and the outcome variables of customer satisfaction in an electronic environment. It disagreed with Oliver's attribution process model and proposed that satisfaction drove attribution, which in turn drove repurchase.
(Lin et al., 2005);		√	ECT; web sites; Empirical study	SEM + LISREL 300 undergraduate students	Confirmation, Satisfaction, Perceived Usefulness, Perceived Playfulness Continuance Intention	The research included "playfulness", which was found to be more important than perceived usefulness in the context of continuance use of the website.

Table 2.1 Continued

Reference	Level of analysis		Theory/ Method	Analysis Tools and Sample size	Constructs	Main Findings
	Org	Indiv				
(Obal, 2017)	√		N/A; disruptive technology (Cloud computing); Empirical study	SEM AMOS 18.0 211 managers	pre-adoption inter-organizational trust, mimetic competitor pressures, normative supplier pressures, efficiency motives, searching efforts, satisfaction and post-adoption	The research finds, normative pressures from supplying organisations prior to adoption led to lower user satisfaction and, consequently, lower intentions to continue adopting and using the technology. Moreover, these pressures were driven by pre-adoption levels of inter-organizational trust and mimetic pressures from competitors. Potential adopting managers of a disruptive technology should instead be driven by efficiency oriented motives and actually aim to increase their searching efforts in order to better understand the disruptive technology prior to adoption.
(Ha, 2006);		√	ECT; Online service; Empirical study	SEM+AMOS _ 229 consumers	Confirmation, Satisfaction, Performance, Expectation Continuance Use	In this research, perceived information relevance, disconfirmation of information accuracy, and disconfirmation of information relevance displayed significant influence on user information satisfaction.

Table 2.1 Continued

Reference	Level of analysis		Theory/ Method	Analysis Tools and Sample size	Constructs	Main Findings
	Org	Indiv				
(Hong et al., 2006)		√	ISCM, TAM; Mobile Internet; Empirical study.	LISREL; 1826 current website users	Satisfaction, Confirmation, Perceived Usefulness, Perceived Ease of Use Continuance Use	This research proposed an extension of ISCM using the TAM model. It also presented a model to explain both continuance intention and continuance adoption.
(Jia et al., 2017)	√		ISCM; TOE; Enterprise 2.0 platform users	PLS-SEM; 206 organisation's senior management	Satisfaction Confirmation perceived usefulness Organisation scope Organisation Size Subjective norm Competitive pressure continuance intention	This study extends the ISCM with four constructs from organizational context (organisation size, organisation scope, subjective norms and competitive pressure). The research findings show that subjective norms and competitive pressure, significantly affect the Chinese enterprises' intentions to renew their E2.0 service and the constructs perceived usefulness and satisfaction are no longer the strongest predicators of continuance use.
(Roca et al., 2006);		√	TPB, TAM, ISCM; E-learning service; Empirical study	SEM + LISREL; 172 individual	Satisfaction, Confirmation, Perceived Quality, Perceived Usability, Perceived Control, Subjective Norm	This research established that perceived quality (information quality, service quality, and system quality) had a prominent effect on confirmation and satisfaction. User confirmation was also found to have an impact on perceived usefulness.

Table 2.1 Continued

Reference	Level of analysis		Theory/ Method	Analysis Tools and Sample size	Constructs	Main Findings
	Org	Indiv				
(Walther et al., 2018)	√		Extending IS success model with discontinuance model; Cloud Enterprise Systems; Empirical study	PLS-SEM	continuance forces: System quality; Information quality Net benefits continuance inertia: Technical integration; System Investment	The results show that continuance intention can be predicted both by socio-organizational (net benefits) and technology-related factors (system quality and information quality), explaining 55.9% of the dependent variable's variance.
(Yin et al., 2015)		√	Positive mood theory; Social networking sites (SNS); Empirical study	CFA + hierarchical regression models; 629 Facebook users	Fear of missing; Enjoyment; Negative affect; Perceived information privacy risk continuance intention	This study finds that fear of missing out and enjoyment are both positively related to continuance intention, whereas negative affect is negatively related to continuance intention. Perceived usefulness positively moderates the relationship between enjoyment and continuance intention and that between negative affect and continuance intention. Perceived information privacy risk positively moderates the relationship between and continuance intention.

Table 2.1 Continued

Reference	Level of analysis		Theory/ Method	Analysis Tools and Sample size	Constructs	Main Findings
	Org	Indiv				
(Qin, 2007)		√	ISCM; Online shopping; Empirical	SEM + CFA; 179 registered users of three websites	Perceived Risk, Trust, Disconfirmation, Satisfaction, Perceived Usefulness, Shopping Environment	This research revealed that the effect of perceived risk on satisfaction had been stronger than perceived usefulness while the combined effects of trust and satisfaction on continuance intention had been stronger than the effect of shopping enjoyment.
((Doong & Lai, 2008)	√		ISCM; E-negotiation; Empirical study	LISREL; 170 negotiators	Disconfirmation, Satisfaction, Perceived Usefulness; continuance intention	This research emphasized the importance of ENegotiation Systems (ENS) and that monitoring users' disconfirmation continuously had been important for ENS. Thus, the research established that ECT had been influential in explaining ENS.
(Premkumar & Bhattacherjee, 2008)	√		ISCM; TAM IT adoption and IT continuance; Longitudinal study	PLS-SEM; 87 administrative and self-personnel	Disconfirmation, Satisfaction, Perceived Usefulness; Control, Post Usage Perceived ease of use, IT Self-Efficacy continuance intention	This research extended the ISCM model and presented the continuance behavior variable. It also explained the post-usage usefulness (or perceived usefulness) and the PBC variable in detail.

Table 2.1 Continued

Reference	Level of analysis		Theory/ Method	Analysis Tools and Sample size	Constructs	Main Findings
	Org	Indiv				
(Kang, Hong, & Lee, 2009)		√	ISCM; Online service; Empirical study	PLS-SEM; 349 undergraduate students.	Past Use, Satisfaction, Regret, Self-Image, Confirmation, Congruity, Perceived Usefulness continuance intention	This research established that post-adoption beliefs, including perceived usefulness and perceived enjoyment, were formed mostly by self-image congruity. It also found that regret significantly predicted continuance intention.
(Chen, Huang, Huang, & Sung, 2009)		√	SCT, TAM, and ECT; Internet shopping; Empirical study	SEM + LISREL; 342 Internet shoppers	Perceived Usefulness, Internet self-efficacy, Confirmation, Satisfaction. continuance intention	The study determined users repurchase intention through satisfaction and perceived usefulness. It also discusses the insignificance of Internet self-efficacy for perceived usefulness and confirmation.
(Ho, 2010)		√	TAM, ISCM, cognitive model, and self-determination model; E-learning; Empirical study	SEM + AMOS; 709 online Learners	Satisfaction, Attitude, Confirmation, Perceived Ease of Use, Perceived Usefulness, Autonomy, Competence	This research integrated TAM, ISCM, SelfDetermined Model (SDM), and the COGM models to develop an integrated model that displayed higher predictive power than each of the single model alone in explaining e-learning continuance intention.

Table 2.1 Continued

Reference	Level of analysis		Theory/ Method	Analysis Tools and Sample size	Constructs	Main Findings
	Org	Indiv				
((Wen, Prybutok, & Xu, 2011);		√	ISCM, TAM; Online shopping; Empirical study	SPSS + LISREL; 230 Students	Confirmation, Satisfaction, Perceived Usefulness, Trust, Enjoyment, Perceived ease of use continuance intention	This research asserted that the hedonic aspect of continuance intention is not as important as the other factors, such as perceived usefulness, confirmation, and trust. The integrated model that encompasses the hedonic aspect and the utilitarian factors accounted for 63% of continuance intention variance.
(Lee & Kwon, 2011)		√	ISCM; Web-based service; Empirical study	SPSS + AMOS; 473 Online Shopper	Perceived Usefulness, Confirmation, Satisfaction, Familiarity, Intimacy	This research suggested that affective variables, like familiarity and intimacy, are more powerful in predicting continuity than cognitive factors in the long run.
((Bhattacherjee & Barfar, 2011)		-	Extend ISCM IT continuance	Conceptual Model	Confirmation, Satisfaction, Habit Expected benefits Continuance intention, Continuance behavior	This research extended the ECT for IT continuance with the inclusion of an important behavioural construct; habit. Habit was also found to have a moderation effect on IT continuance.

Table 2.1 Continued

Reference	Level of analysis		Theory/ Method	Analysis Tools and Sample size	Constructs	Main Findings
	Org	Indiv				
(Chang & Zhu, 2012)	√		ISCM; Social Networking Sites (SNS); Empirical study	PLS-SEM; 488 SNSs users	Satisfaction, Confirmation, Flow Experience, Perceived Usefulness (bridging social capital and bonding social capital), Age, Gender	This research found that perceived bridging social capital had a strong influence on users' satisfaction and continuance intention. Perceived bonding social capital, on the contrary, did not exhibit any influence either on satisfaction or on continuance intention. It was also found that flow experience only influenced the satisfaction of users, but not continuance intention.
(Hung et al., 2012)	√		ISCM; Mobile Shopping; Empirical study	SPSS + PLS _ 244 M-shoppers	Confirmation, Perceived Usefulness, Trust, Satisfaction, continuance intention	This research incorporated trust into the ISCM model, presenting it as an important improvement for continuance intention, as well as for enhancing its predictive power.
(Chong, 2013)		√	ISCM and TAM Mobile Commerce Empirical study	PLS-SEM; 410 students Experienced in M-commerce	Confirmation, trust, perceived cost, satisfaction, Enjoyment, Perceived Usefulness, Perceived Ease of use	They found that satisfaction, perceived usefulness, perceived ease of use, perceived enjoyment, perceived cost, and trust had a significant influence on consumer's' m-commerce continuance intentions.

Table 2.1 Continued

Reference	Level of analysis		Theory/ Method	Analysis Tools and Sample size	Constructs	Main Findings
	Org	Indiv				
(Sun et al., 2014)	√		ISCM; social capital theory and UTAUT; online social networks; Empirical study	PLS-SEM; 320 OSN users	Usage Satisfaction Perceived Enjoyment, Shared Norms trust; Tie Strength Effort Expectancy Social Influence Perceived Usefulness	The study found that continuance intention was illuminated considerably via perceived enjoyment, social influence, usage satisfaction, tie strength, perceived usefulness, effort expectancy, shared norms, and trust.
(Kim et al., 2014)		√	Extending ISCM; Mobile Communications Applications	PLS), carried out by PLS Graph _ 250 users experienced with Mobile	Satisfaction, Confirmation, Learning, Habit, Enjoyment, Perceived Usefulness, Switching Costs, Recommendation Intention	The results indicated that both user satisfaction and perceived switching costs played important roles in enhancing users' continuance and recommendation intentions. Besides, learning and habit were found to be the key antecedents of perceived switching costs. Moreover, implications for research and practice are described.
(Hozhabri et al., 2014)		√	ISCM; Online shopping in Iran Empirical study	SEM+AMOS 265 online shoppers	Satisfaction, Confirmation, Perceived Usefulness,	The findings showed that satisfaction, confirmation, and perceived usefulness had been important elements of online shopping continuance intention/repurchase intention in Iran.

Table 2.1 Continued

Reference	Level of analysis		Theory/ Method	Analysis Tools and Sample size	Constructs	Main Findings
	Org	Indiv				
(Walther et al., 2018)	√		Extending IS success model with discontinuance model; Cloud Enterprise Systems; Empirical study	PLS-SEM	continuance forces: System quality; Information quality Net benefits continuance inertia: Technical integration; System Investment	The results show that continuance intention can be predicted both by socio-organizational (net benefits) and technology-related factors (system quality and information quality), explaining 55.9% of the dependent variable's variance.
(Alraimi et al., 2015)		√	Extending ISCM; Massive Open Online Courses (MOOCs) Empirical study	SEM+PLS; 316 users of three main MOOC platforms	Confirmation, satisfaction, Enjoyment, Satisfaction, Confirmation, Perceived Usefulness, Perceived openness, Perceived reputation	The research model depicted that the intention to continue using Massive Open Online Course (MOOC) was significantly influenced by perceived reputation, perceived openness, perceived usefulness, and user satisfaction. In addition, perceived reputation and perceived openness were the strongest predictors and had not been previously examined in the context of MOOCs.
(Hsu et al., 2015)_		√	Extending ISCM; online repeat purchase intention; Empirical	PLS-SEM 246 Online Shopper	Satisfaction, Trust, Confirmation, Website Quality, Value. *Moderator: Habit	The results showed that satisfaction had a significant influence on trust, whereas perceived value, confirmation, and website quality were the significant antecedents of satisfaction.

Table 2.1 Continued

Reference	Level of analysis		Theory/ Method	Analysis Tools and Sample size	Constructs	Main Findings
	Org	Indiv				
(Yang & Lin, 2015)		√	TAM and Task-Technology Fit (TTF); cloud storage service	PLS-SEM; 294 cloud storage users	service support task self-efficacy Opinions of reference groups privacy protection risk perceived usefulness continuance intention	The research results indicate that ‘‘cloud storage service’’, ‘‘unstructured task’’, ‘‘cloud storage self-efficacy’’ and ‘‘opinion of reference groups’’ all have significant positive influences on the ‘‘perceived usefulness’’, which further has influence on users’ continuance intention to use the cloud storage service. The findings also support that the privacy protection risk and the lack of privacy-policy risk in the cloud storage service produce negative moderating effects on the perceived usefulness and the continuance intention.
(Rezvani et al., 2017)	√		ISCM and transformational leadership theory; enterprise systems (ES)	PLS-SEM; 192 users of ES in Malaysian SMEs.	transactional leadership; transformational leadership; perceived usefulness; Satisfaction ES continuance intention	Transformational leadership behaviors of supervisors influence users’ evaluations of satisfaction and perceived usefulness, while their transactional leadership behaviors influence users’ ES continuance intention by moderating the effects of user satisfaction and perceived usefulness on ES continuance intention.

Table 2.1 Continued

Reference	Level of analysis		Theory/ Method	Analysis Tools and Sample size	Constructs	Main Findings
	Org	Indiv				
(Alalwan, 2020)		√	UTAUT2; Mobile food ordering apps (MFOAs)	PLS-SEM; MFOAs users in Jordan	online review, Online rating, And online tracking; Performance expectancy, Effort Expectancy; Social Influences; Facilitating Conditions Hedonic Motivation; hedonic motivation, price value; Habit; satisfaction and continuance intention	The results support the role of online review, online rating, online tracking, performance expectancy, hedonic motivation, and price value one-satisfaction and continuance intention to reuse MFOAs.
(Ramayah et al., 2016)	√		Extending TOE with CEO Characteristics website continuance intention	PLS-SEM; 108 Malaysian SMEs	Innovativeness; IT knowledge; IT attitude; Size; IS knowledge; Relative advantage; Compatibility Cost Security External pressure External support Website continuance intention Web adoption level	CEO's innovativeness, CEO's IT attitude, relative advantage, and cost have a positive effect of f Malaysian SMEs to website continuance intention

Table 2.1 Continued

Reference	Level of analysis		Theory/ Method	Analysis Tools and Sample size	Constructs	Main Findings
	Org	Indiv				
(Joia & Altieri, 2018)		√	TRA +TPB+ TAM+ IDT; e-hailing apps (EHA)	PLS-SEM; 330 passengers who have used EHA	Subjective norms; Perceived usefulness; Perceived ease of use; Complexity; Compatibility; Relative advantage; Trust; User satisfaction Continuance intention of use	perceived utility, compatibility, relative advantage and trust are antecedents of user satisfaction with EHA, this factor being an antecedent of the continuance use intention o same. subjective norms have a direct and statistically significant impact on the continuance use intention of EHA.
(Walther & Eymann, 2012)	√		ISCM + DeLone & McLean; On-Demand Enterprise Systems	A Continuance Model	Organizational Benefits; Confirmation; Service Quality; Application Quality; Satisfaction; System Investment; Technical Integration Continuance Intention	In this study, ISCM is integrated with DeLone & McLean's model of IS success to theorize a model of IS continuance on company level.

2.6 Technology- Organization-Environment Framework

Research on information systems employs various theories (Wade 2009). Historically, adoption/diffusion theories have similarity in content and objectives, but some differences exist in practice (Straub, 2009). Theories of adoption in IS disciplines are aimed at understanding, explaining, or predicting how, why and to what extend individuals or organizations will adopt and agree to deploy a new technology (Choudrie & Dwivedi, 2005). In the broadest sense, adoption theories describe the significant factors influencing technology adoption by individuals or organizations; thus, adoption theories are aimed at recognizing and examining all these determinants (Kuan & Chau, 2001).

This study emphasizes only the Technology–Organization–Environment (TOE) framework as the main adoption theory used by many researchers to develop a model to examine the technology adoption at the organization level. TOE framework proposed by (Tornatzky, Fleischer, & Chakrabarti, 1990), is the most commonly-used adoption theories in IS research and model used frequently at the organizational level (Alrousan & Jones, 2016). In this study, the researcher critically evaluates this theory of adoption with the aim of determining their suitability for the development of the integrated model for explaining continuance use of cloud computing services in the SMEs context.

TOE framework was proposed based on technological, environmental, and organizational factors to be explored within an organisation to clearly define innovation adoption. TOE framework describes the entire innovation process starting from innovation development to adoption and implementation within the context of the organisation. Figure 2.5 depicts the TOE framework which is based on three main variables (technology, organization, and environment) that influence the adoption of new information technology. The technological aspect accounts for the features of innovation (such as cost, availability, and compatibility) which can have a significant effect on the adoption of innovation (Rahayu & Day, 2015); it relates to all the existing relevant technologies to the organisation (Doolin & Troshani, 2007; Tornatzky & Fleischer, 1990a). The organizational aspect accounts for the organizational characteristics that could have an effect on the adoption of innovation; such characteristics include the size, the managerial structure, the degree of complexity, the degree of formalization, the amount of slack resources, the human resources, and the level of connectivity among the employees of the organization (Tornatzky & Fleischer, 1990a). For instance, Zhu, Kraemer, and Xu (2003) observed that big organizations can have access to more financial resources to implement IT innovation; however, Shefer and Frenkel (2005) believed that the conservatory nature of the small organizations is the factor that makes them more reluctant to adopt new technologies.

The environmental aspect accounts for the environmental factors that can affect the adoption of new innovation; such factors include the size and structure of the sector, its competitors, and the applicable policies and government regulations (Tornatzky & Fleischer, 1990a). The other factors which can affect adoption decisions are the organization-partners relationship, the competitors, government, industrial community, and the pressure from the trading partners (Tornatzky & Fleischer, 1990a). To achieve a competitive advantage in a competitive environment, organizations must adopt new technologies to survive the intense pressure in the environment (Doolin & Troshani, 2007). As per Sawang and Unsworth (2011), "there is always a positive and significant relationship between pressure and innovation adoption for SMEs but this is not the case for the large organisations."

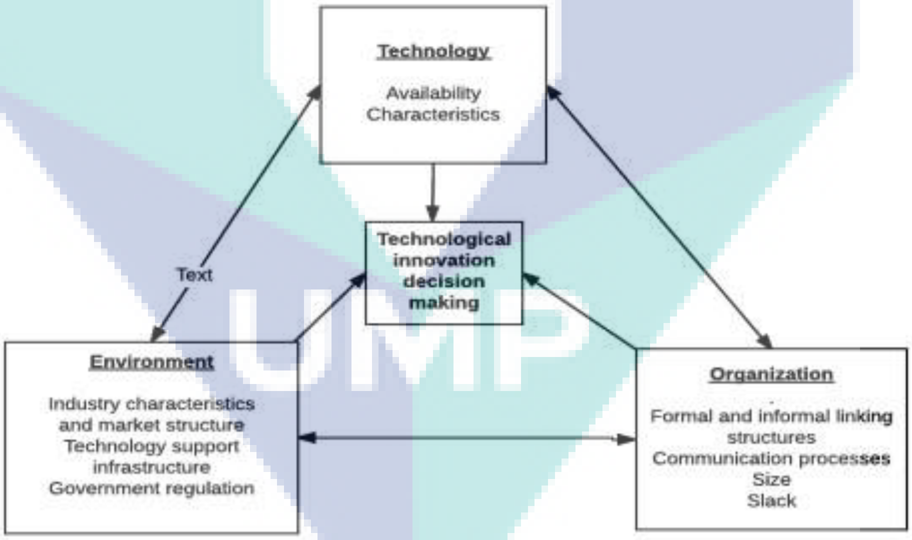

Figure 2.5 Schematic of TOE framework
Source: Tornatzky and Fleischer (1990)

The TOE framework will be chosen as the theoretical basis for integrating with ISCM for the development of an integrated model to study the continuance use of cloud computing services at the organization level. This choice followed several considerations; first, several studies have used the TOE model to investigate the adoption of technology by SMEs. For instance, TOE has been investigated with respect to Electronic Data Interchange (EDI) adoption (Seyal, Rahman, & Mohammad, 2007); Enterprise Resource Planning (ERP) (Pan & Jang, 2008); in Customer Relationship Management (CRM) (Chuchuen & Chanvarasuth, 2011), Knowledge Management (Alatawi, Dwivedi, & Williams, 2013), E-business (Zhu & Kraemer, 2005), electronic commerce (Ahmad, Abu Bakar, Faziharudean, & Mohamad Zaki, 2015; Rahayu & Day, 2015) and cloud computing services (Abdollahzadegan et al., 2013; Alshamaila, Papagiannidis, et al., 2013; Bhatia & Gupta, 2016; Gutierrez, Boukrami, & Lumsden, 2015). These studies confirmed the effectiveness of the TOE model in examining SMEs behavior towards technology adoption. Second, the TOE model considers several contexts and does not only focus on the technological aspect like TAM and DOI; the TOE model also considered both environmental and organizational contexts. Generally, models that cover numerous dimensions are believed to have better explanatory capability compared to those that cover only one dimension (Ahmad et al., 2015; Rahayu & Day, 2015). Third, the TOE model is considered to employ an interactive perspective which gives assumes that organizational changes are not only determined by individuals in the organization but also by the characteristics of the place where they work (Rahayu & Day, 2015). With this interactive perspective, researchers can use one dynamic framework to study all the factors and their interactions (Molla & Licker, 2005) and this is believed to be capable of explaining IT innovation adoption comprehensively.

Therefore, this study considered the technological, organizational and environmental factors that affect the continuance use of cloud computing services by SMEs and also investigates the impact of continuance use on their organizational performance.

2.7 Prior Empirical Studies of Cloud Computing Services

The literature review in this section shows that many scholars extended their researches by integrating several models in order to provide a comprehensive view of technology adoption by SMEs. A Table 2.2 presents a summary of the factors involved in cloud computing services adoption and use by organizations, as identified by the most popular studies. It shows author(s)/years, study factors (construct), methodology, analysis tools, theory used, scope context of study, sample size and the key respondents.

As shown in the Table 2.2, there are many different factors which influence the adoption of cloud computing services. For example, Wu (2011) believe that “attitude toward technology innovations”; “security and trust”; “perceived usefulness” and “perceived ease of use” affect the adoption of cloud computing services in industry organizations. A survey of 211 employees’ and IT staff by Gupta et al. (2013) shows that “cost reduction”; “ease of use and convenience”, “reliability”, “sharing and collaboration” and “security and privacy” can increase the intention to adopt cloud computing services among micro and small businesses. Another survey by Oliveira, Thomas, and Espadanal (2014) indicates that factors including “cost savings”, “relative advantage”, “IT readiness”, “top management support”, “organisation size”, “competitive pressure” and “regulatory support” influencing cloud computing services adoption manufacturing and service industries in Portugal.

Referring Table 2.2; it can be concluded that most of studies (Al-Jabri, 2014; Alshamaila, Papagiannidis, et al., 2013; Gutierrez et al., 2015; Hsu & Lin, 2015; Lian, Yen, & Wang, 2014; Tashkandi & Al-Jabri, 2015b) developed a frameworks based on TOE theory to explored and examined for cloud computing services adoption. Of recently published literature (i.e., since our empirical research was performed), we should not overlook the excellent study by (Martins et al., 2019), which proposed a theoretical model to investigate the factors that affect the use and continuance use of SaaS technology with 301 organisations in Portugal. A structural equation modeling was utilized to evaluate the direct, moderating and mediating effects of the chosen factors on SaaS continuance intentions. The findings indicate that perceived risks, perceived opportunities and actual use of SaaS influenced SaaS continuance use among organisations in Portugal. In addition, top management support and normative pressures influenced SaaS use and Cost saving and security concerns were direct predictors of perceived opportunities and perceived risks respectively. Therefore, the reviewed literature shows that factors of IT adoption and use are either related to categories of theoretical model or other categories developed independently by researchers based on the objectives of each study.

However, they lacked the focus on identifying the organization’s performance gained by cloud computing services adoption. Results from the Table 2.2 can be used as a guideline towards extracting the initial factors that effect on the continuance use of cloud computing services.

Table 2.2 Empirical Studies of Cloud Computing Services

Author(s)/ Years	**Study**	**Factors (Construct)**	**Methodology/ analysis tools/ theory/**	**Scope Context / Sample size / key respondents**
(Wu, 2011),	Developing an explorative model for SaaS adoption	Marketing Efforts (ME) Social Influence (SI); Perceived Benefits (PB) Attitude toward; Technology* Innovations (ATI); Security and Trust (S&T);* Perceived Usefulness (PU);* Perceived Ease of Use * Behavioural Intention (BI)	Questionnaire/ partial least squares (PLS) / TAM	industry categories / 42 CEOs and managers
(Wu, Lan, & Lee, 2011)	Exploring decisive factors affecting an organization's SaaS adoption: A case study	perceived benefits (PB)* perceived risks (PR) Trust of SaaS adoption* Cause-effect factors of PB Cause-effect factors of PR PB-PR matrix	Case Study / mathematical procedure / (decision making trial and evaluation laboratory)	Taiwanese SME: F Company "one of the world's leading manufacturers in the niche and specialized resistor markets/ General Manager and four managers from marketing, production, financial, and information technology departments
(Shin, 2013)	User centric cloud service model in public sectors: Policy implications of cloud services	Behavioural intention Perceived security, * Perceived reliability, * Perceived availability* Perceived access* Perceived Usefulness (PU)* Perceived Ease of Use * Subjective norm	Interview and Questionnaire / SPSS's AMOS / TAM	Public sector Seoul, Korea / 93 end-users of cloud technologies.

Table 2.2 Continued

Author(s)/ Years	Study	Factors (Construct)	Methodology/ analysis tools/ theory/	Scope Context / Sample size / key respondents
(Gupta et al., 2013)	The usage and adoption of cloud computing by small and medium businesses	Cost reduction* Ease of use and convenience* Reliability* Sharing and collaboration* Security and privacy*	online survey and personal interviews/ SmartPLS /	micro and small businesses (SMEs or SMBs) / 211 employees' and IT staff
(Lian et al., 2014)	An exploratory study to understand the critical factors affecting the decision to adopt cloud computing in Taiwan hospital	Human Factors CIO innovativeness; Perceived technical competence Technology: Data security; Complexity; Compatibility; Costs Organization Factors:. Relative advantage; Top manager's support; Adequate resource; Benefits Environment Factors: Government policy; Perceived industry pressure	Questionnaire / SPSS's / TOE	Taiwan's hospital industry / 106 hospital CIOs in Taiwan
(Cheng & Bounfour, 2015)	The Determinants of Cloud Computing Adoption by Large European Organisations	Human: Perceived Usefulness; Perceived Ease of Use Technology: Complexity; Compatibility Organization: Top management support Environment: Adequate resources; Vendor support Government policy; Competitive pressure	Questionnaire / Partial Least Square (PLS) / TAM and TOE	large European organisations in high-tech industries / Information technology (IT) staff and managers

Table 2.2 Continued

Author(s)/ Years	Study	Factors (Construct)	Methodology/ analysis tools/ theory/	Scope Context / Sample size / key respondents
(Oliveira et al., 2014)	Assessing the determinants of cloud computing adoption: An analysis of the manufacturing and services sectors	Security concerns Cost savings Relative advantage Complexity Compatibility Technology readiness Top management support Organisation size Competitive pressure Regulatory support Cloud computing adoption	Questionnaire / Structural equation modeling (SEM) / DOI and TOE	The manufacturing and service industries. (Portugal)
(Yigitbasioglu, 2015)	The role of institutional pressures and top management support in the intention to adopt cloud computing solutions	Mimetic pressures Normative pressures Coercive pressures Slack resources TMT Belief TMT participation Intention to increase the level of CC adoption **TMT= Top management team	Online survey Questionnaire / Partial Least Square (PLS) WarpPLS software	Australian organisations in manufacturing and service industries / 1,170 CIOs, IT manager; IT decision maker and others

Table 2.2 Continued

Author(s)/ Years	Study	Factors (Construct)	Methodology/ analysis tools/ theory/	Scope Context / Sample size / key respondents
(Ratten, 2015)	Factors influencing consumer purchase intention of cloud computing in the United States and Turkey: The role of performance expectancy, ethical awareness and consumer innovation	Perceived usefulness Perceived ease of use Innovation self-efficacy Ethical awareness Performance expectancy Privacy Purchase intention	Survey Questionnaire / LISREL / SCT and TAM	university students / 249 (128 USA, 121 Turkey)
(Safari et al., 2015)	The adoption of software-as-a-service (SaaS): ranking the determinants	Relative advantage, Compatibility Complexity, Trialability Observability, Security and Privacy, IT resource Sharing and Collaboration Culture Competitive Pressure,Social Influence SaaS Adoption	Questionnaire / SPSS software / TOE and DOI	22 experts in the cloud computing field / All the experts had PhD in cloud computing
(Akar & Mardiyan, 2016)	Analyzing Factors Affecting the Adoption of Cloud Computing: A Case of Turkey.	Security, Need,Supplier ,Availability, On demand service, Cost, Legislation and regulations, Reliability, Maintenance, Virtualization, Integration and Performance	Semi-structured Interviews and Questionnaire / SEM	organizations using cloud computing services / 306 IT personnel

Table 2.2 Continued

Author(s)/ Years	**Study**	**Factors (Construct)**	**Methodology/ analysis tools/ theory/**	**Scope Context / Sample size / key respondents**
(Yuvaraj, 2016c)	Perception of cloud computing in developing countries: A case study of Indian academic libraries	Security Reliability Regulatory compliance Complexity Privacy Connection dependence Service provider dependence Technology dependence Data management Skills Integration Lock-in (switching costs) Loss of IT control and ownership Cost uncertainty Lack of awareness Lack of suppliers with satisfactory credentials Lack of standards Lack of liability of providers Internet congestion Over-subscription of services Unclear scheme in Pay-per-use approach Data center location	A structured questionnaire (descriptive survey) and direct interviews / means of descriptive, associational and comparative statistics	Indian academic libraries / 339 library professionals

Table 2.2 Continued

Author(s)/ Years	Study	Factors (Construct)	Methodology/ analysis tools/ theory/	Scope Context / Sample size / key respondents
(Sabi et al., 2016)	Conceptualizing a model for adoption of cloud computing in education	Awareness Cost Risk Relative advantage Compatibility Complexity Observability Trialability Results demonstrable Ease of use Usefulness National infrastructure ICT infrastructure Intent to adopt & use	online survey / Partial Least Squares (PLS) / DOI and TAM	Universities / IT experts and decision makers
(Hsu & Lin, 2015)	Factors affecting the adoption of cloud services in enterprises	Technology: Relative advantage, Ease of use, Compatibility, Trialability Observability Security Organization: Organisation size Global scope, Financial costs, Satisfaction with existing IS. Environment: Competition intensity, Regulatory environment	Questionnaires / Partial Least Squares (PLS) / TOE	enterprises in Taiwan / 102 CIOs

Table 2.2 Continued

Author(s)/ Years	Study	Factors (Construct)	Methodology/ analysis tools/ theory/	Scope Context / Sample size / key respondents
(Tashkandi & Al-Jabri, 2015b)	Cloud computing adoption by higher education institutions in Saudi Arabia: an exploratory study	Technological Factors: Relative Advantage Complexity Compatibility Organizational Factors: Management Support Vendor Lock Data Concern Environmental Factors: Government Regulation Peer Pressure	Questionnaire / SmartPLS SEM / TOE	Universities and Colleges in Saudi Arabia
(Al-Jabri, 2014)	The Perceptions of Adopters and Non-Adopters of Cloud Computing: Application of Technology-Organization-Environment Framework	Technological Factors: Relative Advantage Complexity Compatibility Organizational Factors: Top Management Support Organizational Readiness Environmental Factors: Competitive Pressure Business Partner Pressure	online survey Questionnaire / SPSS / TOE	Saudi organizations / 106 IT managers, IT consultants and IT professional
(Doherty, Carcary, & Conway, 2015)	Migrating to the cloud Examining the drivers and barriers to adoption of cloud computing by SMEs in Ireland: an exploratory study		online survey Instrument (questionnaire) / SPSS	SME in Ireland Irish SME / 95 owners and managers

Table 2.2 Continued

Author(s)/ Years	**Study**	**Factors (Construct)**	**Methodology/ analysis tools/ theory/**	**Scope Context / Sample size / key respondents**
(Wu et al., 2013b)	Factors hindering acceptance of using cloud services in university: a case study	PEOU criteria 1. interaction with the internal cloud solution is clear and understandable. 2. Does not require a lot of effort. 3. easy to use 4. easily get the internal cloud solution to do the job PU criteria 1. Improve job performance. 2. Improve productivity. 3. Enhance job effectiveness. 4. Useful for the job.	Case Study / DEMATEL and TAM	Taiwan University / Vice President, Director of Library and Information Centre, and senior IT staff
(Alshamaila, Papagiannidis, et al., 2013)	Cloud computing adoption by SMEs in the north east of England: A multi-perspective framework	Technological Relative advantage Uncertainty Compatibility Complexity Trialability Organizational Size Top management support Innovativeness Prior IT experience Environmental Competitive pressure Industry Market scope Supplier efforts and external computing support	Semi-structured interviews / TOE	SMEs in the north east of England / 15 Managers

Table 2.2 Continued

Author(s)/ Years	Study	Factors (Construct)	Methodology/ analysis tools/ theory/	Scope Context / Sample size / key respondents
(Abdullah & Seng, 2015) 2015	Acceptance of Cloud Computing In Klang Valley's Health Care Industry, Malaysia	Perceived usefulness Perceived ease of use Institutional trust Attitude toward use Perceived Risk	Questionnaire / SPSS / TAM	Hospitals in Klang Valley, Malaysia / 138 doctors and nurses
(Saedi & Iahad, 2013b)	An Integrated Theoretical Framework for Cloud Computing Adoption by Small and Medium-Sized Enterprises	Technology: Cost-savings; Relative advantages; Compatibility; Accessibility; Lack of Data Security; Lack of Data Privacy Organization: Size; IT Resources; Top Manager Intentions Environment: Service-Level agreement; Competencies; Government Supports; Competitor Pressure; Friends and Family; Members Advises; IT Specialist and; Consultants Advises; Business Network Advises	Conceptual Model/ TOE and ANT	SMEs in Malaysia
(Gutierrez et al., 2015)	Technological, organisational and environmental factors influencing managers' decision to adopt cloud computing in the UK	Technology: Relative Advantage, Complexity, Compatibility Organisation: Top Management Support, Organisation Size; Technology Readiness Environment:Competitive Pressure Trading Partner Pressure	Online survey instrument (questionnaire) / SAS Base 9.4 / TOE	Range of industries and organizations sizes / 257 Mid-to-senior level business and IT professionals

2.8 Factors Influencing Cloud Computing Services Adoption and Use.

Reviewing the literature on cloud computing services adoption assists the researcher to determine what already known about the adoption factors in the cloud computing services context and how extensively the topic has already been researched. Therefore, these most frequent adoption factors used in the previous studies will be presented to experts to determine the most significant factors that affect continues adoption of clouds computing services. In this regard, there is a need to identify the factors that affect the organizations to adopt and use cloud computing services. Table 2.3 extracted demonstrated factors that influencing the continuance use of cloud computing services at the organization level.

To identify the most crucial factors in ensuring continuance use of cloud computing services in organizations reviewed the literature on the cloud computing adoption was conducted. The aspects that decide the adoption of cloud computing services on the organizational level were extracted based on Wymer and Regan (2005) criteria. The first step to determine such list of factors was the identification and listing of all the reported factors in the included set of studies. The literature review suggested 53 factors (as shown in Table 2.3), extracted from 30 published papers in journals and conferences. The second step is to filter the factors by reorganizing, alphabetizing, consolidating and then eliminating the factors from other researches that identified the same factors with different terminology. Then, the set of consolidated factors were determined and mapped to information of all authors who studied every variable and eliminated the factors at the individual level, like subjective norm, found in the list.

The most common factors according to the Table 2.3 are relative advantage and complexity, these factors determine the cloud computing services adoption in an organization. Many studies used different terminologies to describe the same factor. For instance, many researchers have used different terms to describe the advantages of using cloud computing services such as cloud computing services benefits (Hsu, Ray, & Li-Hsieh, 2014), relative advantage (Oliveira et al., 2014; Saedi & Iahad, 2013a), and perceived usefulness(Ratten, 2015; Sabi et al., 2016). Other studies have used the term ‘complexity’ to describe the perceived degree of difficulties in understanding and using cloud computing services in order to represent different terminologies like perceived convenience (Bhatiasevi & Naglis, 2016); ease of use (Hsu & Lin, 2015) and complexity (Alshamaila, Papagiannidis, et al., 2013; Asadi, Nilashi, Husin, & Yadegaridehkordi, 2017). Other researchers used the term cloud computing services perceived security and privacy as separate factors (Gupta et al., 2013; Ratten, 2015; Shin, 2013), while the others merged them as one factor (Yuvaraj, 2016c).

Table 2.3 Factors Influencing the Continuance Use of Cloud Computing Services in Organization Level

Factors	Studies	Frequency
Relative advantage	(Abdullah & Seng, 2015; Alismaili, Li, & Shen, 2016; Alshamaila, Papagiannidis, et al., 2013; Asadi, Nilashi, Husin, & Yadegaridehkordi; Bhatiasevi & Naglis, 2016; Cheng & Bounfour, 2015; Gangwar et al., 2015; Gutierrez et al., 2015; Hsu & Lin, 2015; Ishan, Matthew, William, & Scott, 2016; Lal & Bharadwaj, 2016; Lian et al., 2014; Mohammed, Ibrahim, & Ithnin, 2016; Mohammed, Mohammed, et al., 2016; Oliveira et al., 2014; Ratten, 2015; Sabi, Uzoka, Langmia, & Njeh, 2016; Saedi & Iahad, 2013b; Safari, Safari, & Hasanzadeh, 2015; Senyo, Effah, & Addae, 2016; Shin, 2013; Tan & Kim, 2015; Tashkandi & Al-Jabri, 2015b; Wilson, Khazaei, & Hirsch, 2015; Wu, Lan, & Lee, 2013a; Yuvaraj, 2016a)	26
Complexity	(Abdullah & Seng, 2015; Alismaili, Li, & Shen, 2016; Alshamaila, Papagiannidis, et al., 2013; Asadi et al.; Bhatiasevi & Naglis, 2016; Cheng & Bounfour, 2015; Gangwar et al., 2015; Gupta et al., 2013; Gutierrez et al., 2015; Hsu & Lin, 2015; Lal & Bharadwaj, 2016; Lian et al., 2014; Mohammed, Ibrahim, et al., 2016; Mohammed, Mohammed, et al., 2016; Oliveira et al., 2014; Ratten, 2015; Sabi et al., 2016; Safari et al., 2015; Shin, 2013; Tashkandi & Al-Jabri, 2015b; Wu et al., 2013a; Yuvaraj, 2016b; Yuvaraj, O'Connor, & Cossham, 2016)	23
Perceived security and privacy	(Akar & Mardiyan, 2016; Alismaili, Li, & Shen, 2016; Asadi et al.; Gupta et al., 2013; Hsu & Lin, 2015; Ishan et al., 2016; Lian et al., 2014; Mohammed, Ibrahim, et al., 2016; Mohammed, Mohammed, et al., 2016; Oliveira et al., 2014; Qian, Baharudin, & Kanaan-Jebna, 2016; Ratten, 2015; Saedi & Iahad, 2013b; Safari et al., 2015; Senyo et al., 2016; Shin, 2013; Wilson et al., 2015; Yuvaraj, 2016b; Yuvaraj et al., 2016)	19
Compatibility	(Alismaili, Li, & Shen, 2016; Alshamaila, Papagiannidis, et al., 2013; Cheng & Bounfour, 2015; Gangwar et al., 2015; Gutierrez et al., 2015; Hsu & Lin, 2015; Lian et al., 2014; Mohammed, Ibrahim, et al., 2016; Mohammed, Mohammed, et al., 2016; Oliveira et al., 2014; Sabi et al., 2016; Saedi & Iahad, 2013b; Safari et al., 2015; Senyo et al., 2016; Tashkandi & Al-Jabri, 2015b; Wilson et al., 2015)	16
Cost reduction	(Akar & Mardiyan, 2016; Alismaili, Li, & Shen, 2016; Asadi et al.; Cheng & Bounfour, 2015; Gupta et al., 2013; Hsu & Lin, 2015; Lian et al., 2014; Oliveira et al., 2014; Qian et al., 2016; Sabi et al., 2016; Saedi & Iahad, 2013b; Wilson et al., 2015; Yuvaraj et al., 2016)	14
Top management support	(Alshamaila, Papagiannidis, et al., 2013; Cheng & Bounfour, 2015; Gangwar et al., 2015; Gutierrez et al., 2015; Lal & Bharadwaj, 2016; Lian et al., 2014; Mohammed, Ibrahim, et al., 2016; Mohammed, Mohammed, et al., 2016; Oliveira et al., 2014a; Qian et al., 2016; Saedi & Iahad, 2013b; Senyo et al., 2016; Tashkandi & Al-Jabri, 2015b; Wilson et al., 2015)	14
Competitive pressure	(Alshamaila, Papagiannidis, et al., 2013; Cheng & Bounfour, 2015; Gangwar et al., 2015; Gutierrez et al., 2015; Hsu & Lin, 2015; Lian et al., 2014; Oliveira et al., 2014; Qian et al., 2016; Saedi & Iahad, 2013b; Safari et al., 2015; Senyo et al., 2016; Tashkandi & Al-Jabri, 2015b; Wilson et al., 2015)	13

Table 2.3 Continued

Factors	Studies	Frequency
IT readiness	(Gutierrez et al., 2015; Lian et al., 2014; Mohammed, Ibrahim, et al., 2016; Mohammed, Mohammed, et al., 2016; Oliveira et al., 2014; Sabi et al., 2016; Saedi & Iahad, 2013b; Safari et al., 2015; Senyo et al., 2016; Tashkandi & Al-Jabri, 2015b; Yuvaraj et al., 2016)	10
Government policy	(Akar & Mardiyan, 2016; Cheng & Bounfour, 2015; Hsu & Lin, 2015; Lian et al., 2014; Oliveira et al., 2014a; Saedi & Iahad, 2013b; Senyo et al., 2016; Wilson et al., 2015; Yuvaraj et al., 2016)	9
Firm size	(Alshamaila, Papagiannidis, et al., 2013; Gutierrez et al., 2015; Hsu & Lin, 2015; Oliveira et al., 2014a; Saedi & Iahad, 2013b; Senyo et al., 2016; Wilson et al., 2015)	7
Trialability	(Alshamaila, Papagiannidis, et al., 2013; Hsu & Lin, 2015; Mohammed, Ibrahim, et al., 2016; Mohammed, Mohammed, et al., 2016; Sabi et al., 2016; Safari et al., 2015)	6
Perceived reliability	(Akar & Mardiyan, 2016; Gupta et al., 2013; Qian et al., 2016; Shin, 2013; Yuvaraj et al., 2016)	5
Vendor support	(Akar & Mardiyan, 2016; Alshamaila, Papagiannidis, et al., 2013; Cheng & Bounfour, 2015; Lal & Bharadwaj, 2016; Yuvaraj et al., 2016)	5
Perceived availability	(Shin, 2013; Wilson et al., 2015; Yuvaraj, 2016b)	3
Uncertainty	(Alismaili, Li, & Shen, 2016; Alshamaila, Papagiannidis, et al., 2013; Mohammed, Mohammed, et al., 2016)	3
Perceived Trust	(Abdullah & Seng, 2015; Asadi et al.; Bhatiasevi & Naglis, 2016)	3
Perceived access	(Saedi & Iahad, 2013b; Shin, 2013)	2
Sharing and collaboration	(Gupta et al., 2013; Safari et al., 2015)	2
CIO innovativeness	(Alshamaila, Papagiannidis, et al., 2013; Lian et al., 2014)	2
Adequate resource	(Cheng & Bounfour, 2015; Lian et al., 2014)	2
Innovation self-efficacy	(Bhatiasevi & Naglis, 2016; Ratten, 2015)	2

Table 2.3 Continued

Factors	Studies	Frequency
Performance expectancy	(Akar & Mardiyan, 2016; Ratten, 2015)	2
Observability	(Hsu & Lin, 2015; Safari et al., 2015)	2
Lack of awareness	(Sabi et al., 2016; Yuvaraj et al., 2016)	2
Satisfaction with existing IS	(Hsu & Lin, 2015; Tan & Kim, 2015)	2
Risk	(Abdullah & Seng, 2015; Sabi et al., 2016)	2
Task	(Mohammed, Ibrahim, et al., 2016)	1
Culture	(Safari et al., 2015)	1
Social Influence	(Safari et al., 2015)	1
Need	(Akar & Mardiyan, 2016)	1
On demand service	(Akar & Mardiyan, 2016)	1
Maintenance,	(Akar & Mardiyan, 2016)	1
Virtualization,	(Akar & Mardiyan, 2016)	1
Integration,	(Akar & Mardiyan, 2016)	1
Connection dependence	(Yuvaraj et al., 2016)	1
Data management	(Yuvaraj et al., 2016)	1
Lock-in (switching costs)	(Yuvaraj et al., 2016)	1
Lack of standards	(Yuvaraj et al., 2016)	1
Lack of liability of providers	(Yuvaraj et al., 2016)	1

Table 2.3 Continued

Factors	Studies	Frequency
Ethical awareness	(Ratten, 2015)	1
Observability	(Sabi et al., 2016)	1
Cloud Flexibility,	(Ishan et al., 2016)	1
Quality of Service	(Ishan et al., 2016)	1
Social influence	(Asadi et al.)	1
Scalability of computing resources	(Yuvaraj, 2016b)	1
Return on Time	(Yuvaraj, 2016b)	1
Organisationa competency	(Gangwar et al., 2015)	1
Training aneducation	(Gangwar et al., 2015)	1
Firm Scope	(Senyo et al., 2016)	1
ROI	(Mohammed, Ibrahim, et al., 2016)	1
Cloud Knowledge	(Mohammed, Ibrahim, et al., 2016)	1
IT Skills	(Mohammed, Ibrahim, et al., 2016)	1
IT Standards	(Mohammed, Ibrahim, et al., 2016)	1

2.9 Small and Medium Enterprises (SMEs)

The presence of small and medium enterprises (SMEs) is felt in every aspect of the economy where they contribute significantly to the economic development of countries (Alrousan & Jones, 2016) through the provision of direct employment and contributing significantly to business (Mirbargkar, 2009). The SMEs are also important for the sustained long-term growth of a country (Thassanabanjong, Miller, & Marchant, 2009). SMEs play an important role in the global economy by creating a safe and transparent investment environment to overcome the paralysis of the global economic crisis (Ho, Ahmad, & Ramayah, 2016). In many nations, SMEs are considered a source of national wealth, and government leaders and economic experts worldwide, including developing countries, understand SMEs bring vital contributions to national and global economic development (Assante, Castro, Hamburg, & Martin, 2016). In developing countries, in particular, SMEs contribute to economic growth by improving income distribution, productivity, efficiency and economic structure, even amid economic downturn (Adam & Musah, 2014).

More than 60% gross domestic product (GDP) and >70% of total employment of most developing countries are contributed by the SMEs (Ayyagari, Demirgüç-Kunt, & Maksimovic, 2011). They also account for a large portion of the workforce in the developed countries. The SMEs in SMEs, for instance, accounts for about 42% of all the employees in the private sector (Loera & Marjański, 2015). SMEs contributes about two-thirds of all employment in the European Union (Loera & Marjański, 2015). In the U.S., SMEs directly contributes about 50% of the GDP from the non-agricultural sectors (Hammer, 2010). Therefore, SMEs must be supported as "one of the major driving forces of motivating private ownership and commercial skills" to ensure economic development (Gadenne & Sharma, 2009).

2.9.1 SMEs Characteristics and Significance

SMEs effectiveness has been widely acknowledged in the literature (Berrell, Singh, Garg, & Deshmukh, 2009; Fathian, Akhavan, & Hoorali, 2008; Okpara, 2009; Sanayei & Rajabion, 2012). They contribute to the economic growth of a country, especially the developing countries (Fathian et al., 2008; Gadenne & Sharma, 2009) where they seem to be the only workable prospects for increases in employment and as a major driver of economic innovation or growth (Rahman, 2016). As per (Okpara, 2009), the economic benefits associated with SMEs include “fosterage of entrepreneurial and managerial talents, establishment of jobs as a low capital cost, reducing income disparities, and the training of skilled and semi-skilled workers for future economic development”. SMEs have also be demonstrated to be capable of innovating and bringing new technologies to bare (Elghany, 2015).

The effectiveness of the SMEs basically depends on the people that own and manage the daily events of the organisation. Mostly, the decision-making process in the SMEs is solely based on the expertise and experience of the manager (Garengo, Biazzo, Simonetti, & Bernardi, 2005). Garengo et al. (2005) provided some of the individual characteristics of SMEs as having “unstructured processes, simple organizational structure, informal relationships, compete based on cost capability, informal control system, focusing on technical aspects and production, and learning by doing” (Dufour & Son, 2015; Rostami, 2016). The SMEs are believed to have “unpretentious procedures, instant feedback processes, a shorter policymaking chain, better perceptions, and fast response to customers’ demands compared to the larger organisations” (Okpara, 2009; Singh, Garg, & Deshmukh, 2008).

Comparing the SMEs with large organizations, Alshardan, Goodwin, and Rampersad (2015) concluded that SMEs have a completely different system, culture, procedures, human resources, mart, and customers. The common features of the SMEs have been summarized to include “greater operational flexibility, emerging out of individual skills and initiatives, high possibility to adopt technology, high capacity to innovate export, dependence on locally available workforce and resources, high employment orientation, reduction of regional imbalances, and resilience to crisis and shocks (Ankur, 2010)”. One specific attribute of the SMEs is that the required activities for their improvement are directly borne out of their circumstances.

2.9.2 Barriers to SMEs growth

Despite the increasing role of the SMEs in the development of nations, only a few SMEs have realized their full potential due to the presence of several barriers (such as finance, time, people, and lack of knowledge) which suppress their sustainability and growth (Sahran, Zeinalnezhad, & Mukhtar, 2010). These barriers make it difficult for the

SMEs to adopt new technologies that will drive their development (Parida, Westerberg, & Frishammar, 2012). In developing countries, the SMEs supported by the government through supporting programs. Additionally, they suffer from insufficient long-term strategies, management resources, (Isa, Zaroog, Sivabalan, & Raju, 2014), and strategic information (McNamee, O'Reilly, Shiels, & McFerran, 2003). SMEs may also have the intention of either working for "local niches or progress the somewhat narrow specialties". The major problem in SMEs, as per Singh et al. (2008), are usually related to areas like product design, competence development, training facilities, and networking. For the SMEs, there is no defined framework for them to follow in order to quantify their competitiveness or develop their operational strategies (Singh et al., 2008). Furthermore, the competitiveness of SMEs is facing several barriers, such as their "failure to address provide the necessary technological requirements, as well as not having the appropriate system for the transfer of the technology". They are also faced with the problem of lacking management aptitude (Berrell et al., 2009). The study by (Alshardan et al., 2015) has highlighted some of these barriers in addition to having a management with little or no knowledge of new improvement techniques, lacking the related marketing skills, and having regulated access to marketing and distribution channels. The other identifiable obstacles to SMEs growth are low level of IT adoption and organizational restriction to change. Okello-Obura and Matovu (2011) further mentioned that the information system in the SME sector of many developing countries is characterized by poor information environment.

This review focused on the importance of motivating the processes that lead to the growth of the SMEs (Alrousan & Jones, 2016). The SMEs may keep growing in the global and local marketplace by improving/reinventing new business techniques, such as the adoption of new technologies (like cloud computing services) to boost their growth.

2.9.3 Malaysian SMEs sector

There is no generally accepted definition of SMEs as the definition could vary from one industry to another and from one country to another (Al-Alawi & Al-Ali, 2015). Different countries have different definitions of an SME. In October 2013, the National SME Development Council (NSDC) published a second version of the standard definitions for SMEs which must be used by all agencies, ministries, and financial institutions in Malaysia. The scope of the definitions for SMEs, as per NSDC, in

Malaysia, rests on two major criteria, which are the number of employees and the annual sales turnover. Based on these criteria, an organisation can only be classified as SMEs if meets both criteria ("number of employees or annual sales turnover").

For instance, Figure 2.6 showes that, in the services sector, an organisation can be considered a micro-enterprise if it has < 5 full-time workers or < RM300,000 in annual sales turnover. Organisations with 5 to 29 full-time employees or about RM300,000 to RM3million in annual sales turnover are considered small enterprises, while those with 30 to 75 full-time employees or RM3million to RM20 million in annual sales turnover are considered as medium enterprises. This study follows this guideline to categorize the SMEs into micro, small and medium-sized enterprises. Since SMEs usually do not intend to reveal their annual sales turnover, for this study, only the number of the employees was used to determine the size of the organization.

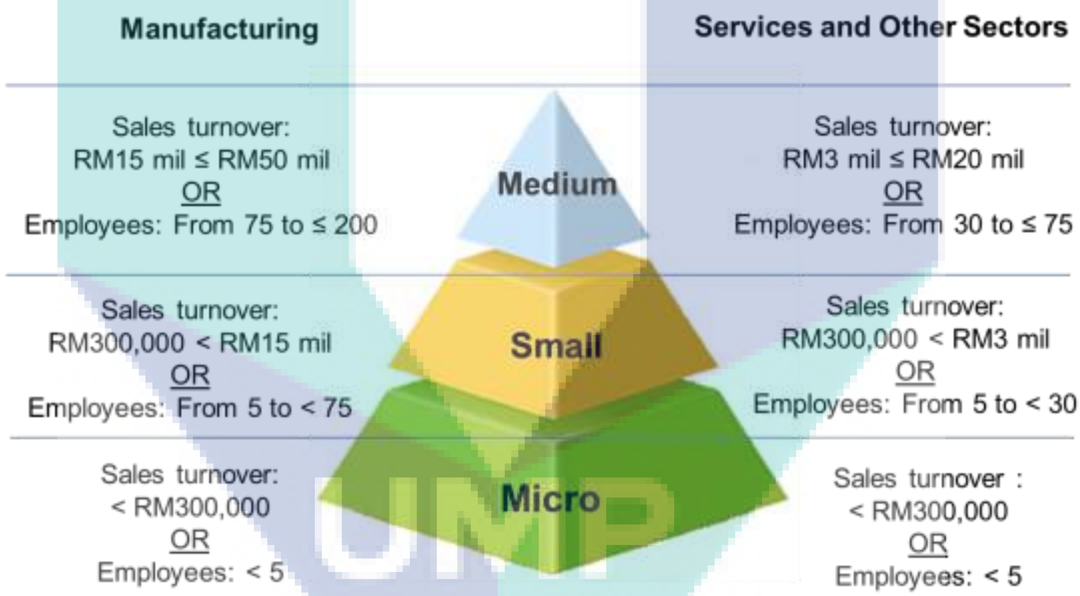

Figure 2.6 SMEs definitions in Malaysia
Source: National SME Development Council, NSDC; (2013)

In the context of the present study, Malaysian SMEs are considered one of the cornerstones of the nation's economic growth, promoting quality of life, infrastructure development, and overall stability in the nation (Lo et al., 2016b). According to the Malaysian SME annual report 2015/2016, there were 645,136 SMEs in operation nationwide, accounting for approximately 97.3% of the total business establishments, 65.5% of the total employment and 36.3%% of GDP in Malaysia; exports of Malaysian

SMEs rose from 16.4% in 2010 to 7.6% in 2016. For the year 202, the SMEs in Malaysia are projected to contribute more to the economic development of the country. They are expected to generate > 99.2% of the total business establishments in Malaysia and account for 62% of total employment, 41% of the nations' GDP, and 25% of the total exports.

2.10 Organizational Performance

Organizations are commonly defined as instruments of purpose creating value for its products and services amongst the customers. Organizations compete with each other to gain a competitive advantage by having better performance (March & Sutton, 1997). Performance has been the major concern for most organizations (both profit or non-profit organizations). Owners or managers often strive to identify the factors that negatively affect their performance in order to address them and place the organization in a position of competitiveness and profitability (Abu-Jarad, Yusof, & Nikbin, 2010). Performance has been measured and conceptualized in different ways by different scholars, putting forth different opinions, approaches and definitions of performance (Barney, 1986). According to Venkatraman and Ramanujam (1986), "the main concern is the use of the appropriate approach to measure and understand the concept of performance".

Performance is an important aspect of an organization as it portrays the success of the organization in terms of meeting its objectives. Several studies have tried to investigate how to improve organizational performance while some have focused on the "predictors of organizational performance" (Mahmood & Hanafi, 2013). Studies by Rogers and Wright (1998) and March and Sutton (1997) reported that organizational performance, in most organization researches, has been extensively researched as a dependent variable. This was supported by Carton and Hofer (2010) who noted that performance has also been used as a dependent variable in most SME researches.

This study will try to measure organizational performance through 10 different items to measure financial and non-financial performance at an organization level. The measurement items to measure the financial performance are including profitability, cuts down the operational costs, market share, productivity. Non-financial performance items are including clients' satisfaction, competitive edge, retrieve accurate data and overall organizational performance with respect to competitors combined into one construct. These measurement items are commonly used as performance measures in SMEs researches (Akter, Wamba, Gunasekaran, Dubey, & Childe, 2016; Jaworski & Kohli, 1993; Keh, Nguyen, & Ng, 2007; Lo, Wang, Wah, & Ramayah, 2016; Wamba et al., 2017; Wiklund, 1999; Wiklund & Shepherd, 2005; Yusuf, Gunasekaran, & Dan, 2007; Zhu & Kraemer, 2005). Furthermore, the performance measures used in this work are commonly used in the service and manufacturing sectors. Moreover, a comprehensive view of organizational performance can only be created by using different kinds of measures (Jaworski and Kohli (1996); Wiklund (1999). The concept of philosophy provides that it must be always improved for it to survive due to the never-ending competitive nature of the marketplace.

2.10.1 Performance definition

Scholars have always provided different definitions and conceptual explanation of performance. Heffernan and Flood (2000) stated that in modern management, there is no existing conceptual clarity that can be used to describe different aspects of performance as a concept. Such non-existence of a universal definition also applies to the area of measurement. Often, researchers do confuse "performance" with "productivity", but both terms actually differed (Wade & Recardo, 2001). Productivity is the "volume of work done in a specified amount of time", while performance refers to "a wider perspective that consists of productivity, quality, consistency" (Abu-Jarad et al., 2010). As per Awadh and Alyahya (2013), the performance of an organization refers to the capability and capacity of the organization to accomplish its set objectives through an efficient and effective way of using the available resources to the organization. Similarly, Wade and Recardo (2001) perceived organizational performance as the organizations' ability to achieve their set goals and objectives.

2.10.2 Organizational performance measurement

The importance of performance is widely recognized by organizations. Several scholars have used several financial and non-financial factors to measure performance; the financial factors include factors like "the gross profit, profitability, return on sale, return on asset, return on equity, return on investment, and revenue growth", while the non-financial factors include "market share, sales growth, stock price, and export growth" (Gimenez, 2000). There are also inconsistent measures of performance as observed by several scholars (Denison & Mishra, 1995; Kotter, 2008; Marcoulides & Heck, 1993).

Doyle (1994) similarly pointed out that there is no single indicator that can be used to measure organizational performance since organizations can measure their performance using different objectives and subjective measures. Some studies have also measured performance using effectiveness and efficiency; the effectiveness-related measures are those that focus on matters like employee satisfaction and business growth while efficiency-related measures focus on the input/output relationship. profitability has also been argued to be the most common performance measure (Doyle, 1994).

The data for the measurement of organizational performance can be sourced either from published records (secondary data) or from the organization directly (primary data). The financial data information in the case of SMEs is extremely difficult to obtain from secondary sources but may be available in the case of large, publicly held companies (Abu-Jarad et al., 2010).

Dess and Robinson (1984) observed that the private ownership structure of SMEs makes it difficult to obtain their financial data as the owners are not obliged to publish their financial performance. This is complicated by the fact that such managers are often unwilling to voluntarily release such information to outsiders. Additionally, the accuracy of the financial statements of SMEs is usually in doubt because such information is usually unedited.

Sapiena (1988) stated that SME owners can easily agree to the subjective assessment of their organizational performance rather than to financial measures. Thus, this section reviewed some of the organizational performance dimensions used by the previous studies. However, the perceptual assessment measures were employed by most of the studies since they are more practical.

2.10.3 Information technology and organizational performance

Organization performance can be improved by the advancements in IT, especially from the development of new trade and business technologies (Jahanshahi, Rezaei, Nawaser, Ranjbar, & Pitamber, 2012). The primary aim of using IT is to boost business performance (Zhu & Kraemer, 2005). According to Clayton and Criscuolo (2002), IT-enabled organizations are more likely to rate the impact of innovations on their performance as positive compared to those without IT. Another study by Khan and Motiwalla (2002) on the “influence of electronic commerce on corporate performance in the USA" reported that out of the 44 investigated companies, 64 % of them found electronic commerce to have a positive influence on their investments. Contrarily, Jahanshahi et al. (2012) investigated small businesses in India and found IT adoption (even in its early stages) to have a positive significant influence on the operational and market performance. Similarly, IT adoption and organizational performance presented a strong correlation in the manufacturing and service SMEs in the USA (Abebe, 2014). The direct and indirect effects of big data analytics on organizational performance was examined by (Gunasekaran et al., 2017) using data from 297 Chinese IT managers and business analysts with big data and business analytics experience. The results of this study confirmed that there are direct and indirect impacts of big data analytics on organizational performance.

As has been mentioned previously, the success of IT initiatives can be obtained by measuring their effect on the results. Previous researches provide evidence that adopting IT initiatives can lead to better process and organizational performances (Gunasekaran et al., 2017; Pinho & Ferreira, 2017). However, the impact of IT initiatives, including continuance use of cloud computing services in organizational performance, is a research perspective that is yet to be fully explored, especially from the SMEs perspective (Rodrigues et al., 2014). Until now, most of the studies on "cloud computing services" have focused on the adoption and usage aspects, effectively neglecting the impact of this adoption and usage on the created value, especially its impact on organizational performance.

2.11 Research Gaps

Based on the arguments presented earlier and the literature analysis, the following important points have emerged and required further attention:

First, as discussed in section 2.7, several previous pieces of research have studied the factors that affect the pre-adoption of cloud computing services. However, studies on the post-adoption phase, including the studies on factors that affect the continuance use of cloud computing services have remained lacking. The continuance use of cloud computing services is, at least in some sense, a new phenomenon, and its long-term effects on organisations may require additional time to be observed; nonetheless, adopting cloud computing has certain consequences that have immediate and significant implications for the organisation (Schniederjans & Hales, 2016).

Secondly, from sections 2.3, 2.4, and 2.5, the focus of the literature on continuance use has been on the individual level and where an extensive lack of research has been identified of the organizational level. The ISCM is one of the most widely used models for evaluating information system continuance at the individual level. However, most prior ISCM based studies have only focused on the individual level (as discussed in section 2.5). The continuance use of technology at the individual level differs from that at the organizational level. In this context, the decisions of the continuance use at the individual level are typically taken by individuals (i.e., consumers or end-users). In contrast, the decisions made at the organizational level are usually accompanied by decision-makers in these organizations. To address the limitation of ISCM to examine the continuance use at the organization level, ISCM must combine with organizational levels theory (e.g., TOE framework) to provide a comprehensive image of the continuance use of IT innovations as suggested by (Nguyen et al., 2015; Rezvani et al., 2017; Walther & Eymann, 2012; Walther et al., 2018).

Thirdly, findings regarding the effect of IT adoption on the performance of firms are mostly inconclusive, and the link between the continuance use of cloud computing services and the SME organizational performance has not been investigated. Several studies and reports have demonstrated that expected benefits for the organizations cannot be easily derived from IT innovations at the pre-implementation stage (Hazen et al., 2012; Kupfer et al., 2016). Previous research has provided evidence that adopting IT initiatives leads to improved performance of processes and of the organization as a whole. However, the impact of IT initiatives, including the continuance use of cloud computing services in organizational performance, remains an under-researched area of study, especially in the SME segment (Rodrigues et al., 2014).

Finally, in general, in the field of cloud computing, a huge of studies carried out on technological issues, including cloud performance, security, privacy data management, and so on. Further research is required to cover the business issues of cloud computing, including adoption, acceptance, and continuous use (Bayramusta & Nasir, 2016; Jia et al., 2017; Motta & Sfondrini, 2011; Yang & Tate, 2012). This study focused on the antecedents of the continued use of cloud computing services and the implications of continuance use of this technology on their performance, focusing on the context of SMEs in Malaysia.

2.12 Chapter Summary

The literature review in Chapter 2 began with an overview of cloud computing services elements including the importance, definition, benefits for individuals and organizations, delivery models and the main characteristics of the cloud computing services of cloud computing services followed by the main streams in cloud computing based on literature. It's clear that, for all types of organizations to obtain the benefits of cloud computing, they must adopt the technology. After initial adoption, continuance use of cloud computing services is important for both providers and users to gain benefit from the technology.

Following this, insights into the differences between adoption and continuance use in the IS literature were discussed. Additionally, ISCM model as a base of continuance use behavior and TOE framework as a dominant theory of IT adoption at the organization level were discussed. As a result, it could be concluded that TOE framework accompanying was the most eligible and suitable theory for combining with ISCM model and developing an integrated for cloud computing adoption by SMEs. Although previous studies have discussed a range of factors that affect cloud computing services adoption by SMEs, such adoption is still low and previous studies have not paid much explicit attention to the factors related to continuance use which are considered important in the adoption of IT initiatives and in their success

Furthermore, SMEs' definition, characteristics, barriers of growth, and SMEs Malaysian sector are explained. Finally, this chapter presents, definitions of organizational performance, measurement, and the relationship between IT adoption and organizational performance. Based on this, raised this main research question "Does the continuance use of cloud computing services affect organization performance of SMEs in Malaysia?"

CHAPTER 3

METHODOLOGY

3.1 Introduction

The reviewed literature in the preceding chapter showed a gap regarding the factors that influence the continuance use of cloud computing services and their effect on SMEs' performance. Several methodologies have been used in different studies and each method portrays the different aspects of the whole picture. It is, therefore, important to choose the right methodology that will provide a systematic approach and guide towards fully achieving the research objectives. This chapter detailed the methodology used to empirically examine the proposed integrated model, address the research questions, and achieve the objectives listed in Chapter 1.

This chapter began with the research operational framework to present the research phases and understand the flow of the research. Moreover, the unit of analysis will be demonstrated and justified. Then, the sampling design, including the target population, sampling technique, selection criteria, and sample size justification will be described. The instrument development and validation processes will be discussed, followed by the data collection technique. The final section will discuss the procedures for data analysis and the summary of the chapter.

3.2 Research Operational Framework

The methods and procedures are included in the research operational framework to help the researcher throughout the research process. Figure 3.1 illustrated the research operational framework; it presented the stages and activities undertaken to conduct this study and the outcomes of every stage. To achieve the objectives of this study, the research methods were carefully selected to properly address the identified research questions. This research was conducted in five main phases as follows:

Phase 1: Preliminary study and literature review.

Phase 2: Model Development and Hypotheses

Phase 3: Instrument Development and Pilot Study

Phase 4: Model Validation and Verification

Phase 5: Conclusion and Implications

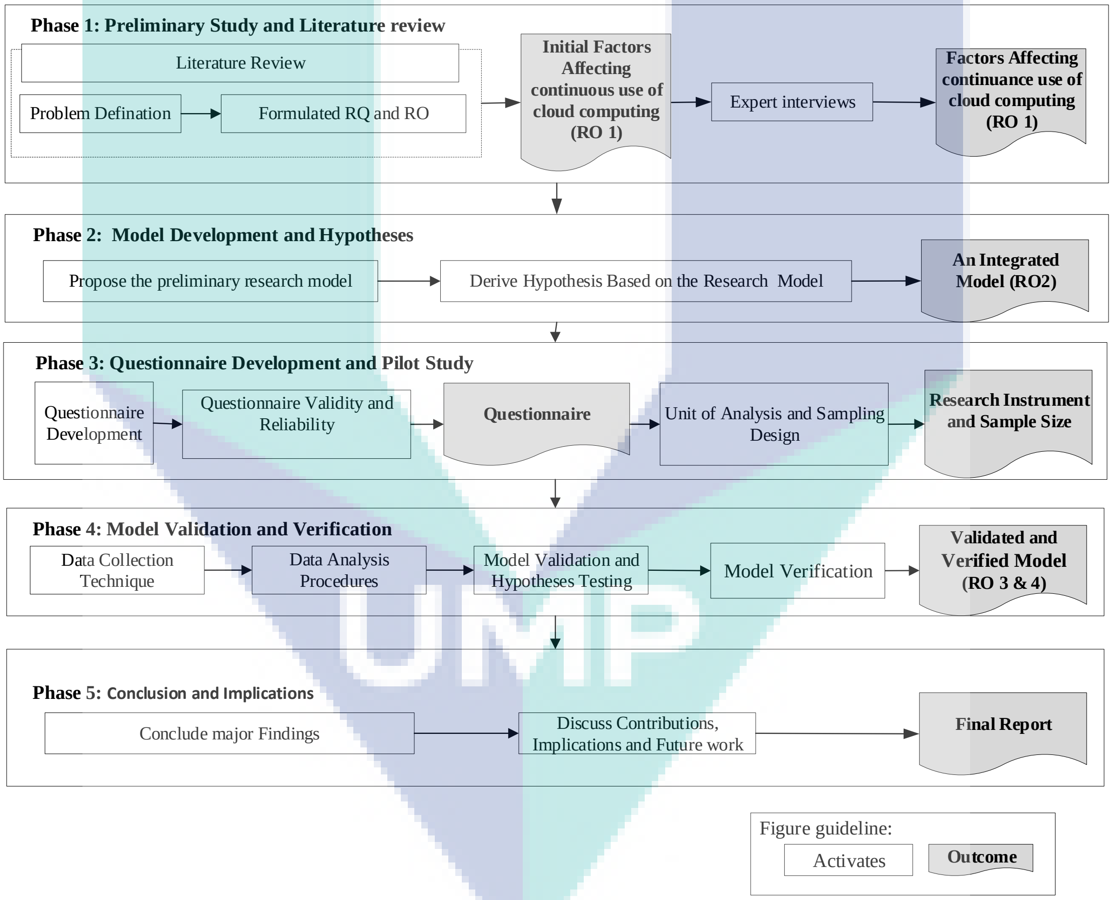

Figure 3.1 The Research Operational Framework

3.3 Phase 1: Preliminary study and literature review

The first phase of the study involved a systematic exploration of the existing literature on cloud computing services, Information System continuance, IT adoption, SMEs, and organization performance. This stage was imperative to i) clearly define the research problem, ii) formulate the research questions and objectives, iii) review the literature on adoption theories, continues use theories, SMEs and organization performance, iv) identify the most important factors that affect the continuance use of cloud computing based on the literature review, and v) validate the identified factors by experts.

Having determined the work area for a research project, the next thing is to search for the relevant sources of information that will assist in determining the already existing facts about a given topic, as well as determining the current situation of the topic. Most times, a researcher may find new perspectives that demand further exploration from the existing literature on the related field.

The first step of the research formulation phase is to define the research problem. The research can refer to the previous studies to find the area that previous researchers recommended future studies which are yet to be explored. This can be done by going deep into the subject to identify what needs to be researched and why. This journey begins with the capability of the research to project the problem from a wider perspective, identifying the important issues and those that must be considered. The research can also refer to the identified gaps in the previous studies, such as questions that cannot be answered immediately. A problem definition consists of an objective and a logically inferred question which together records exactly what and why is being researched.

The problem definition reflects the research questions and objectives. After problem definition, the researcher then translates the difficulty into a set of research questions and objectives. With the research objectives, the researcher indicates what he wants to achieve with his study. In this study, the existing literature was critically reviewed to identify the factors. The outcomes of this phase included the most common factors extracted from reviewed literature followed by a semi-structured email interview with professionals that aimed at validating those identified factors that affecting the continuance use of cloud computing services in the organization level. details of factors extraction (refer to sections 2.8 and 4.2), as well as the factors validation, will be addressed in section 4.3. Table 3.1 presents the detailed operational framework for Phase 1 of the study.

Table 3.1 Research Operational Framework for Phase 1

Phases 1	Activities	Objectives	Instruments	Outcomes
Preliminary Study and Literature Review	Problem definition	To understand the background of the problem	-	Problem statement
	Formulating of RQ and RO	To formulate of research questions and objectives	-	Research questions and objectives
	Literature review	To review the literature covering adoption theories, continues use theories, SMEs and organizations performance.		Initial factors affecting continues use of cloud computing services
	Expert intervew	To identifying the most important factors that affecting continues use of cloud computing derived from LR	Semi-structured interview via Email	Revised factors affecting the continues use of cloud computing services

3.4 Phase 2: Model Development and Hypotheses

The output of the first phase served as the input of the model development and hypotheses phase as it included the most critical factors that affect the continuance use of cloud computing services at the organizational level. In this phase, the construction of the integrated model of the study was guided by the identified factors that influence the continuous use of cloud computing services and its influence on the performance of SMEs which were extracted from previous studies and validated by twenty-three experts from IT practitioners and academia. The integrated model was based on the integration of the ISCM with TOE framework as an organizational level adoption theory. The details of the integrated model constructs and the hypothesized relationships were discussed in the next chapter (Chapter 4).

This integrated model consists of the most important factors that affect the continuance use of cloud computing services, as well as the effect of cloud computing services used on the performance of SMEs. The outputs of this second phase will be the integrated model for continuance use of cloud computing services, with 15 relationships identified between 14 constructs of the research model while 15 hypotheses were derived.

The discussion of the second phase was presented in Chapter 4 while the operational framework for phase 2 was detailed in Table 3.2.

Table 3.2 Research Operational Framework for Phase 2

Phases 2: Structural Model Development	Activities	Objectives	Instruments	Outcomes
	Propose the research model	To propose the research model	ISCM and TOE framework	Research model
	2.2 Derived the research hypothesis	To derived the research hypothesis	-	Research hypothesis

3.5 Phase 3: Questionnaire Development and Pilot Study

In the third phase, the quantitative survey instrument was developed to validate the concepts and the conceptual model variables, and to verify the significant influencing factors on continuance use of cloud computing services and its effect on the performance of SMEs.

The measurements in the survey instrument relied heavily on the available instruments designed in the prior studies. The dimensions of each construct and the items of each dimension were identified based on previous studies and the operational definition. Then, the produced survey instrument passed through a set of processes to ensure its validity and reliability through content validity, defined the sample size, and pilot study. The development of the final questionnaire instrument and the determination of the sample size were the outputs of this phase. The questionnaire was distributed to the targeted respondents in Malaysian SMEs. The next subsections illustrated the questionnaire development processes and activities.

3.5.1 Questionnaire Development

The design of a questionnaire is widely based on the research objectives and the kind of information needed by the researchers. A well-structured questionnaire allows the collection of the same type of information from different people in the same manner; it also allows a systematic analysis of the collected data. The quality of the information gathered is directly proportional to the quality of the instrument for the data collection. There are 14 latent constructs to be measured and examined. A broad literature review was used to design the instrument of this study. To measure each construct, the items were adopted from previously validated empirical researches. The usage of previously validated items will increase and assure the content validity and reliability of the items used for the constructs in the study. The questionnaire has 3 major parts which measured the continuance use behavior of cloud computing services by the targeted SMEs (Appendix A). The cover letter and consent form made up the first part of the instrument; this part also provided the background information of the researcher. Cloud computing service was also defined in this part to help the respondent with a better understanding of the study. Also provided in this part was the contact information of the researcher and his team to help the respondents direct their concerns about the collected data to the researcher. The second part of the questionnaire contained the demographic information of the targeted respondents and their organizations. This section has five questions that bothered on the respondents' information and six questions on the organization's information. The third part of the questionnaire presented the anticipated factors that influence the continuance use of cloud computing services in the SMEs. This part of the questionnaire contained 76 items and each item reflects a measurement construct under the related dimension. A 5-point Likert scales was used to address the scales of the constructs in the model (where 1 = strongly disagree and 5 = strongly agree). The usage of 5-point Likert scales in a survey instrument is one of the techniques in eliminating common scale properties which reduce common method bias for this study (Podsakoff, Mackenzie, & Podsakoff, 2012). Furthermore, 5 points Likert-type scale was used to increase response rate and response quality along with reducing respondents' "frustration level" were to became possible to compare reliability coefficients with other research using five-point Likert Scales. The details of the questionnaire development process will be discussed in the Chapter 5.

3.5.2 Validity and Reliability of the Questionnaire

3.5.2.1 Content validity

The assessment of content validity is an important step to be employed when developing an instrument (Moore & Benbasat, 1991; Polit & Beck, 2006). Hence, in this research, content validity was attained by ensuring that all items were derived from the existing literature related to this study; furthermore, five experts (drawn from the academics and industry) were invited to review the instrument items for correctness and relevance (MacKenzie, Podsakoff, & Podsakoff, 2011; Moore & Benbasat, 1991). The experts were selected based on their skills and knowledge in information systems-related research. We opted for only five experts based on the recommendation by (Aziz & Kamaludin, 2016; De Vaus, 2013) for a minimum of 3 experts and a maximum of 10 experts for research instrument evaluation. After the expert review for content validity confirmation, the pilot study was conducted as previously described before embarking on the main survey.

3.5.2.2 Pilot study

Pilot testing is an important aspect of any research that should be carried out before the main data collection. During the pilot survey session, the researcher aims to assess the impact of the instrument constructs and their associated items. Moreover, pilot study helps the researcher to predict the sample size required to proceed with the main study and also offers opportunities to enhance the study methodology before proceeding to the main research study (Urbach & Ahlemann, 2010). Although (regarding to sample size for pilot study) several sample sizes have been recommended in the literature, among the studies, Isaac and Michael (1995) and Hill (1998) recommended a sample size of about 10-30 respondents, while other academicians such as De Vaus (2013) suggested 5-100 samples as required to validate any research instrument, mentioning that more samples will result to more reliable results. According to this recommendation, 86 SMEs were considered adequate for this study.

3.5.3 The Unit of Analysis

In any study, the unit of analysis is the targeted entity that the researcher aims to depend on for the investigation and collection of data toward measuring the model variables (Bhattacherjee, 2012). Therefore, the unit of analysis could be individuals, communities, groups, countries, or organizations (Gray, 2013). It is important that the researcher understands the unit of analysis to enable the accurate determination of the type and the resource of data to collect. The understanding of the unit of analysis will also help the research to formulate the research question since the technique for data collection, sample size, and even the selection of variables for the proposed framework may sometimes depend on the level of data aggregation for analysis (Sekaran & Bougie, 2016). According to Pinsonneault and Kraemer (1993) and Sekaran and Bougie (2016), the unit of analysis can be determined by pondering on how to state and define the research questions. In this study, the unit of analysis was at the organization level because:

- The main research objectives and research questions of this study clearly bothered on understanding cloud computing services continuance use in the SMEs context. Therefore, the unit of analysis in this study was at the organization level.
- The current study aimed at examining the proposed relationships among the factors in the proposed research model based on the organization theories (TOE framework integrated with ISCM) at the organization level (Malaysian SMEs).
- The decision-makers in the SMEs (owners, CEO or IT managers) were selected as the targets within the SME since they are the most knowledgeable people and deemed to be in the best position to respond to the survey questions.

3.5.4 Sampling Design

Sampling refers to the process of selecting the appropriate number of the right unit or element from the population to provide a better understanding of the sample's properties and characteristics, and to facilitate the generalization of such characteristics to the population (Sekaran & Bougie, 2016). Sampling is used when it is not possible to include the whole of a population in research or when population size is difficult to determine (Saunders, Lewis, & Thornhill, 2012). To do this, the sample should adequately represent the unit of analysis (Pinsonneault & Kraemer, 1993). This section described the sampling processes of this study, including the target population, the sampling technique, the criteria for selecting SMEs, and the minimum sample size required.

3.5.4.1 The target population

Population refers to the entire group of units or elements of interest to the researcher for the investigations to achieve the study objectives (Bryman & Bell, 2011; Sekaran & Bougie, 2016). The population should be identified first before creating the sample (Creswell & Creswell, 2014). This study strives to determine the factors that influence the continuance use of cloud computing services by the Malaysian SMEs, as well as the effect of this technology on their performance. Therefore, the target population of this quantitative study consisted of SMEs in Malaysia who utilize cloud computing services in their activity. Malaysian SMEs have been chosen as the target population because of their significant role and contribution to the economic growth of Malaysia (contributing about 98.5% of the established business outfits in Malaysia; SME Annual Report 2017/18). The SME Corporation Malaysia is considered a point of reference for information and advisory services for all SMEs in Malaysia. Based on the SME Corporation Malaysia annual report (2017/18), 907,065 SMEs are active in five different sectors. Table 3.3 demonstrats the number of Malaysian SMEs in the Services, Manufacturing, Construction, Agriculture and Mining & Quarrying sectors in Malaysia. To ensure greater representation, this study was drawn from all these sectors. This study considered (owner, CEO or IT manager) as the key informant (as the point of contact) who work in SMEs that adopted cloud computing services in their IT capabilities. It is expected that the rate of using cloud computing **services** among Malaysian SMEs would be higher due to the incentives provided by the Malaysian government through MSC Malaysia Cloud Initiative organized by Malaysia Digital Economy Corporation (MDEC) to encourage SMEs to adopt and use cloud computing services.

Table 3.3 Number of Malaysian SMEs

Sector	**No. of SME Establishments**			
	Micro	Small	Medium	Total
Services	649,186	148,078	11,862	809,126
Manufacturing	22,083	23,096	2,519	47,698
Construction	17,321	17,008	4,829	39,158
Agriculture	4,863	4,143	1,212	10,218
Mining & Quarrying	217	458	190	865
Total	693,670	192,783	20,612	907,065

Source: SME-Corp Annual Report (2017/2018)

3.5.4.2 Sampling Technique

The goal of sampling techniques is to draw a representative number of participants from a larger population of interest (Sekaran & Bougie, 2016). Sampling techniques can either be probability-based and non-probability-based sampling. The probability method is a process of selecting a sample in which there is an equal chance of selecting all the element or unit. Regarding the non-probability sampling method, there is no equal opportunity of selecting the element or unit in the population; where such selection probability exists, it may not be accurately determined (Bryman & Bell, 2011; Saunders et al., 2012; Sekaran & Bougie, 2016)

In this study, the non-probability method was considered because the number of SMEs that utilize cloud computing services in their activities is unknown and could not be individually identified. The non-probability method is very useful in getting general ideas about the phenomenon of interest. Non-probability sampling can be in four different forms: convenience, purposive (judgmental), quota, and snowball sampling (Sekaran & Bougie, 2016).

Among the many well-known forms of non-probability sampling, purposive sampling, also known as the judgmental method is the most suitable when collecting data from a particular type of respondents who are willingly or conveniently accessible and are providing the needed information due to their special characteristics of having this information or conforming to the selection criteria set by the researcher (Sekaran & Bougie, 2016). Purposive sampling is an effective form of non-probability sampling when there is a need to monitor a specific cultural domain (Tongco, 2007). Purposive sampling is ideal for this research because it allows communication with the object population of the researched SMEs who use cloud computing services. Furthermore, the decision-maker in SMEs were purposefully selected for data collection because they are the best-placed to provide the needed responses to the research questions.

3.5.4.3 SMEs Selection Criteria

For the purpose of this study, SMEs selection criteria were developed to ensure that information was obtained from a sample of people representing the population. The definitions of SMEs provided by the National SME Development Council (NSDC) was used to identify the appropriate SME for inclusion in the study. In addition, participants were asked to answer questions regarding their organizations' usage of cloud computing services and how long they have been using cloud services and what type of payment method they choose when paying for cloud computing services.

To achieve the research aims, the Malaysian SMEs were surveyed from various sectors. The organizations involved in this research met the following criteria:

- The organization must be located in Malaysia.

- Use at least one of the cloud computing services.
- Sales turnover of the organizations must not exceed RM50 million for the manufacturing sector and RM20 million for the services and other sectors.
- Organizations must have <200 full-time employees for the manufacturing sector and <75 employees for the services and other sectors.

3.5.4.4 Sample Size

The sample size of any research within the targeted population must be specified. Suitably determined sample size must be suitable for the advanced statistical (SEM) analysis and results' generalization to the entire population (Hair Jr, Hult, Ringle, & Sarstedt, 2016; Sekaran & Bougie, 2016). The determination of the sample size is based on several factors, such as the objective of the study, the confidence interval, the time and cost limitations, as well as the population size (Sekaran & Bougie, 2016). Several methods of sample size justification exist in the literature but no consensus has been reached on the minimum sample size to be considered. As per Sekaran and Bougie (2016), sample sizes >30 and <500 are reasonable for most researches. Regarding PLS-SEM which was used in this study, the 'ten times rule' suggests the "sample size being at least 10x the largest number of structural paths directed at a particular latent construct in the structural model" (Barclay, Higgins, & Thompson, 1995). The maximum number of paths directed at the continues use of cloud computing services in this study is 11 constructs; thus, based on this rule, the current study requires 110 respondents as a minimum sample size.

Hair Jr et al. (2016) however considered the ten times rule a rough guideline for the selection of minimum sample size, and that PLS-SEM, like other statistical techniques, requires the consideration of the sample size against the models' background and data attributes. The required sample size must be specifically determined using power analyses based on the aspect of the model with the maximum number of predictors (Hair Jr et al., 2016). Hence, a power analysis (Cohen, 1988) was performed in this work using G*Power software (Faul, Erdfelder, Buchner, & Lang, 2009). The statistical power analysis of F test was performed using 0.95 Power, 0.05 alpha level, effect size 0.15, and 11 predictors. The selection of the power, alpha, and effect size followed the recommendation of (Cohen, 1988) for power analysis-based sample size determination.

The software showed that the minimum number of sampling should be 178 as this study employed 436 usable surveys. Unfortunately, 21 of these samples had missing values and were not considered. The full setting and the result of G* power software were presented in Figure 3.2.

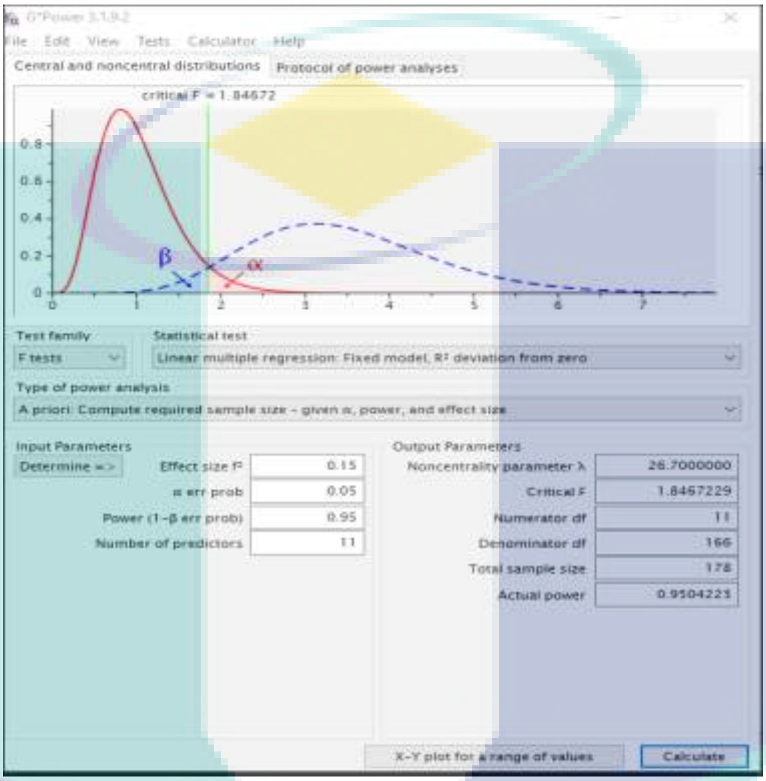

Figure 3.2 G* Power Software Results

3.6 Phase 4: Model Validation and Verification

The model validation and verification phase involved the quantitative and qualitative part of the study. In more detail, this study depended on literature as the secondary resources for exploring and identifying the most important factors that affect the continuance use of cloud computing services, and an expert interview to refine and validate these factors to achieve the first objective. Besides, quantitative and qualitative research has been defined as an approach to testing objective theories via the examination of the relationship between factors within the conceptual framework and to discover the extent to which the model was applicable and useable by Malaysian SMEs. (RO3 and RO4).

The fourth phase involved the actual survey data collection, survey data analysis with SEM, model validation and hypothesis testing as well as model verification. In this phase, the collected data were analyzed using Smart PLS 3.0 software. Then, the relationships between the factors that will affect the continuance adoption of cloud computing services, continuance adoption of cloud computing services and organizational performance were analyzed and evaluated to develop and validate the final model. In addition, the hypotheses of the research were tested. Finally, model verification with two Malaysian SMEs has been done through a case study strategy to achieve the last objective in this study. The details of phase four will be discussed in the following main sections.

3.6.1 Data Collection Technique

After instrument development and validation, data collection is the next step. According to Creswell (2014), data collection is the most significant step during any research. the current study adopted a survey research method for data collection from Malaysian SMEs using a self-administered questionnaire. This survey method involves the deductive approach using positivist quantitative methodologies (Saunders et al., 2012). It involves data collection using several methods such as mail, email, self-administrated questionnaire, and telephone interview. In this work, the self-administrated questionnaire method was used for data collection because:

- The data collection process in this study was done by both internet-based and paper-based survey using self-administered approach.

- Self-administered questionnaire approach was adopted for this study because this method has been widely used in the information system research area and adopted by many studies in related studies (Alshamaila, Papagiannidis, et al., 2013; Ramayah et al., 2016). Furthermore, the aim of this study is to examine the factors that affect the continuance use of cloud computing services which involves several SMEs in the Malaysian perspective.

- The empirical evaluation of the 15 research hypotheses in this study for the proposed structural model can only be done using the survey research approach.

The online-based survey (using SurveyMonkey) was adopted to conduct the survey research approach. E-mail and weblink invitations were sent to the prospective participants before sending the e-mail that contains the weblink to the survey site.

The email list of the SMEs as obtained from the SME Corporation Malaysia (SME Corp) directory which is the central coordinating agency under the Ministry of Entrepreneur Development Malaysia responsible for the formulation of the policies and strategies for SMEs' in Malaysia. They also serve as the central point of reference for SME-related research and data dissemination. Another function of the Corporation is to provide SMEs and entrepreneurs with business advisory services throughout Malaysia.

The first invitations were sent on March 12, 2017, to 1462 emails and the survey remained available until Feb 2018. To encourage participation, additional invitations and reminders were sent weekly. By the mid of April 2017, only 15 completed surveys had been received from the targeted SMEs by emails even though reminders had been sent. With this low response rate, the researcher decided to adopt the paper-based survey beside the online-based survey. The paper-based instrument version reflected the online-based instrument version (see samples presented in Appendixes A & B).

The researcher visited many conferences and workshops organized by SME Corp between May 2017 and Jan 2018 (i.e., "POCKET TALK@SME CORP. MALAYSIA: Bagaimana Mendapatkan Dana Sehingga RM 450,000 melalui 'Crowdfunding'?"; "SME Annual Showcase") in Kuala Lumpur and Pahang to explain the aims of the research and distribute the questionnaire to the participants (see sample of permission letter in Appendix C).

Overall, 436 responses were received, with a total of 376 questionnaires collected from the paper-based survey, and 60 received from the online-based survey. Hence, only 415 responses were analyzed after excluding 21 incompletes responses from the paper-based survey version.

3.6.2 Data Analysis Procedures

To achieve the third objective of this study, all the collected data must be analyzed. The tools used for the data analysis include the Statistical Package for the Social Science (SPSS) version 25 and Partial Least Squares Approach to Structural Equation Modeling (PLS-SEM) via SmartPLS software version 3.0. Three main stages were involved in the process; the first stage is important to ensure that the data used for the analysis were valid and complete. This was ensured by detection of data entry errors and investigation for missing values, removing outliers, as well as checking data normality. The descriptive statistic of the respondents and instrument was is the second stage to provide the demographic information of the respondents and their organizations. The mean and standard deviation of each indicator and the overall mean of all the latent constructs were also examined in this stage. The final stage is to use the PLS-SEM approach in the SmartPLS version 3.0 software to empirically assess the developed research model. This stage also involved the assessment of the measurement model and the structural model. The data analysis procedures were summarized in Figure 3.3.

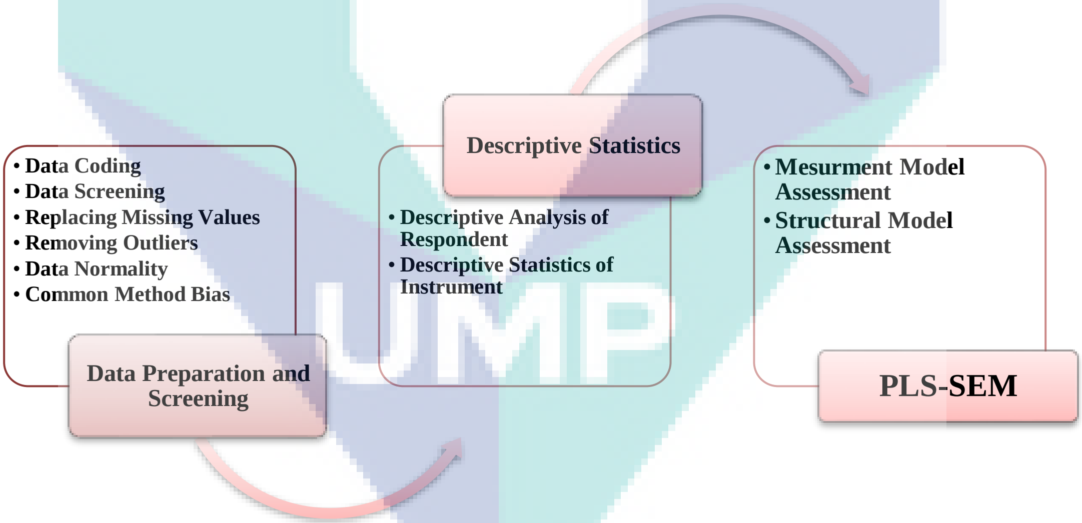

Figure 3.3 Summary of Data Analysis Procedures

3.6.2.1 Data Preparation and Screening

Data preparation is a process in which the raw data is converted to a usable and ready-for-analysis format. The collected data should be validated to determine whether the survey is conducted correctly and to verify if there is any potential of common method bias. Before performing any data analysis, data should be verified to ensure that the data used is valid and complete through detecting data entry errors and investigating missing values, removing outliers, as well as checking the data normality (Hair Jr et al., 2016; Ramayah, Cheah, Chuah, Ting, & Memon, 2018).

Data Coding, Screening and Replacing Missing Values

During data preparation, the first step is data coding for easy data entry and analysis. Data coding implies the assigning of a particular number to the values or levels of each variable of the participants' responses so they can be entered into a database or statistical techniques (Hair, Black, Babin, Anderson, & Tatham, 2006; Hair Jr et al., 2016; Sekaran & Bougie, 2016). For example, the profile of the respondent's data such as gender and age group usually require coding. In this case, the researcher may assign "1" to male and "2" to female (see Appendix A).

After data coding and entry into the database, all the respondent's questionnaires should be screened to check for missing answers. Data screening must be done to ensure the data is clean, reliable, valid and ready for conducting further analyses (Creswell, 2014; Hair Jr et al., 2016). Missing data is a common problem that occurs in any study that utilizes a survey as a tool for collecting data (Recker, Mertens, & Pugliese, 2016). Before running any data analysis, data should be verified for any issues like skipping a few questions (Hair Jr et al., 2016). Ramayah et al. (2018) and Hair Jr et al. (2016) stated that data analysis using PLS-SEM may fail to generate accurate results if there are missing values in the analyzed data and this will make it difficult to build a model that will fit the collected data since SEM analysis is based on the fact that there is no error in the data. The issue of missing data can be resolved using any of the two ways- missing values replacement with estimated new values and deleting of the cases that contain missing values. Data frequency test will be conducted to check if there are problems in the data to ensure the detection of no extreme minimum or maximum value exceeding the range. The missing values in this study were replaced with the mean score if the missing data rate is less than 5%, and delete if the cases that contain missing values exceed 5% (Tabachnick & Fidell, 2001).

Outliers

These are data that are different from other datasets in a group. Hair Jr et al. (2016) referred to outliers as “a giving extreme response to a given question or to all the questions”. The existence of extreme scores is usually checked at the initial data screening process (Tabachnhick & Fidell, 2014). Outliers could result from data collection errors and honest survey responses. Outliers must be identified so that a decision could be made to retain or discard them. Identified outliers in a data set can be deleted from or assigned a high score which is significantly different from the rest of the scores in the cluster (Hair et al., 2006).

The two types of outliers are univariate and multivariate outliers (Tabachnhick & Fidell, 2014). The univariate outlier is cases that come with an extreme or unusual value to a particular variable, whereas multivariate outlier is cases with extreme or unusual values on two or more variables. Various methods have been developed to identify univariate outliers. The most commonly used method for testing univariate outliers is to convert data into standardized scores (z scores) to determine values over 2.5 for small samples and values over 3 or 4 for large samples (Hair et al., 2006). Z-scores’ inspection will enable the identification of outlying cases which is invaluable in data screening. Z-scores in excess (Absolute value) of ± 3.29 ($p < .001$, two-tailed test) are considered univariate outlier cases and can be removed from the data (Tabachnhick & Fidell, 2014).

A multivariate outlier can be calculated by the Mahalanobis distance D2 which measures the deviation of each observation from the central mean of all the observations in a multidimensional space. According to Hair Jr et al. (2016), any case with a D2/df value of more than 3 or 4 in large samples (sample size >=200) should be identified as an outlier. D follows a chi-square distribution with degrees of freedom equivalent to the number of utilized variables in the calculation (Hair Jr et al., 2016; Tabachnhick & Fidell, 2014).

Data Normality

Normality is one of the assumptions required for several statistical tests. It is the "extent the sample data distribution corresponds to a normal distribution". The PLS-SEM is more robust in handling non-normal data because it has flexible assumptions about the normality of the distribution of variables (Henseler, Ringle, & Sinkovics, 2009).

Therefore, in the PLS-SEM, a normality test isn't obligatory, particularly, once the sample size is massive, as within this study (Hair Jr et al., 2016). Furthermore, in PLS, bootstrapping is used to avoid any type of non-normal distribution (Kock, 2018). Nevertheless, it is important to ensure that extreme deviations from normality that could distort the results are not present by tests for detecting normality distribution. As suggested by Hair Jr et al. (2016) and Cain, Zhang, and Yuan (2017), multivariate skewness and kurtosis will be employed in this study as a pre-processing procedure to validate the data by determining the normal distribution of the data.

Common Method Bias (CMB)

The CMB is encountered in survey-based data analysis when the employed measurement method has an influence on the data collected. The major effect of CMB is measurement error (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). CMB is encountered when the differences in the responses are due to the instrument rather than the actual state of the respondents that is aimed to be uncovered with the instrument. This implies that the instrument introduces a bias into the analysis and the achieved results must be polluted by the 'noise' from the biased instruments.

Following Podsakoff et al. (2003), there are two methods to control the impact of CMB occurrence - procedural and statistical remedies. In the data collection stage, this study adopted the procedural remedy, where the participants' anonymity was protected and the options in the instrument were minimized using 5 Likert scales. In addition, the ambiguous terms and concepts in the instrument were defined to ensure the questions are simple and clear and each questionnaire was attached with a cover letter that explained the participants' rights to protection.

For statistical remedies, two statistical tests were performed to check for the potential existence of CMB in the collected data. Firstly, Harman's single factor test was employed to check for CMB, in which all the variables were loaded into a single factor. If the newly created factor shows more than 50% of the variance, this indicates that CMB might exist (Podsakoff et al., 2003). Although, Harman's single factor is the most widely used test in the literature to check whether CMB exists in a data; however, Harman's single-factor approach is faced with few limitations as mentioned by (Kemery & Dunlap, 1986; Kock, 2015). As suggested by (Kock, 2015), this study used the multi-collinearity assessment test using PLS-SEM to check the occurrence of a Variance Inflation Factor (VIF). The model can only be considered CMB-free if all the resulting VIFs from a full collinearity test are =< 3.3.

3.6.2.2 Descriptive Statistic

Descriptive analysis generally refers to the characteristics or profile of respondents(Cater-Steel, 2008). This type of analysis forms the basis of every quantitative study and provides a simple description of the basic features of the collected data. Descriptive analysis helps the researcher to understand the characteristics of collected data. The descriptive analysis is very useful statistics which bring together large amounts of data so that these data can be presented and comprehended with minimal effort and proper illustrations.

Descriptive Statistic of Respondents

SPSS version 25.0 was employed in this descriptive analysis phase to gain an overview of the data. This software is commonly used as a data analysis technique by researchers (Creswell, 2014). The descriptive analysis of the collected data is essential before testing the proposed model. According to (Hair Jr et al., 2016), demographic data can be used for data validation. For the current study, because the sampling method used is purposive, the role of respondents is checked to ensure that the right sample filled the questionnaire.

Descriptive Statistics of Instrument

The means and standard deviations (SD) of all the items related to the constructs used in this study were determined using descriptive analysis since the mean and SD are the commonest descriptive statistics for both ratio-scaled and interval data (Sekaran & Bougie, 2016). The descriptive analysis of data for the variables of any study involves the description of the results using means and SD (Creswell, 2014). The mean and SD are a useful tool in a normal distribution due to the following statistical rules:

3.6.3 Model Validation and Hypotheses testing

There are two recommended stages in PLS-SEM; the first stage involves the evaluation of the measurement model to ensure the suitability of all the items used to measure each construct. Having passed the first stage, the second stage (structural model) begins with the assessment of the relationship between the constructs.

3.6.3.1 Justification Use of Partial Least Square Structural Equation Modeling

Structural Equation Modeling (SEM) enables the researcher to model the association of several endogenous (dependent) and exogenous (independent) constructs concurrently and examining the models' overall fit, as well as to test the relationships between the model constructs (Fornell & Larcker, 1981; Ramayah et al., 2018). The study employed the SEM technique to test relationships among the variables in the proposed model. SEM allows modeling the association of several endogenous and exogenous constructs simultaneously (Ramayah et al., 2018). There are two different types of SEM analysis, namely, covariance-based structural equation modeling (CB-SEM) and partial least square structural equation modeling (PLS-SEM). The choice between the two methods is determined by the objectives and characteristics of a study (Hair Jr et al., 2016). PLS-SEM was selected in this study as the data analysis method to ensure that the measures used are sound and that they sufficiently exhibit the implicit theoretical components (measurement model assessment) to examine the relationships between the constructs (structural model assessment) and to test the proposed hypotheses.

The PLS-SEM is the commonly used multivariate analysis method in several disciplines, including IS research (Hair Jr et al., 2016; Ramayah et al., 2018; Ringle, Sarstedt, & Straub, 2012). Hence, the PLS-SEM was utilized in this study using Smart PLS software as the statistical method for testing the proposed conceptual model for several reasons. As per Chin (2010), PLS-SEM is suitable for testing complex and large models with >=10 constructs and >=50 items. In this study, 14 latent constructs and 76 items were involved; hence, the theoretical model of this study is considered a complex model, justifying the use of PLS-SEM as the suitable data analysis method. Hair, Ringle, and Sarstedt (2011) stated that PLS-SEM is particularly suitable when research is exploratory in nature (the constructs of the model are not very well established), where the research focus is on the prediction of factors related to the continuance use cloud computing services in Malaysian SMEs. According to Chin (1998a), CB-SEM is difficult to use with large independent and dependent variables in the model, especially when exploring new theoretical relationships; therefore, PLS-SEM is more appropriate to be used in this study for accurate results. Table 3.4 presents the reasons for selecting PLS-SEM based on the rules of thumb set by (Henseler et al., 2009) and (Hair Jr et al., 2016).

Table 3.4 Rules of thumb for PLS-SEM

	Criterion
Research Objective	Predicting key target constructs.
	Exploratory research or extension of an existing structural theory.
	Reflective and formative measures are part of the model.
Structural model	Structural model is complex.
	Data did not meet distributional assumptions.
	Small and sample size consideration.
	Normal and Non-normal distribution.
Model evaluation	Use latent variable scores in subsequent analyses.

Source: Hair Jr et al., (2016) ; Henseler et al., (2009)

3.6.3.2 Measurement Model Assessment

A measurement model refers to the description of the interrelationship between the latent constructs and their measurement items. Therefore, measurement model assessment is an important step which must precede the hypotheses tests in the developed research model. Hence, this assessment phase helps in examining the validity and reliability of the model constructs and items (Hair Jr et al., 2016; Ramayah et al., 2018) based on the measurement model (outer model) assessment which identifies the relationships between the items (76 reflective indicators) and their latent variables (14 reflective constructs).

Four criteria are considered when assessing the measurement model; they include assessment of indicator reliability, internal consistency reliability, convergent validity, and discriminant validity at the indicator and construct levels (Chin, 2010; Henseler et al., 2009a; Ramayah et al., 2018). More specifically, the indicator reliability is measured by each of the manifest variables factor loadings and it must exceed 0.7 (Hair Jr et al., 2016; Henseler et al., 2009). Moving on to internal consistency reliability, it is measured by composite reliability (CR) and Cronbach's alpha, with the value being 0.7 (Hair Jr et al., 2016). Moreover, convergent validity is measured through the assessment of average variance extracted (AVE) and it must exceed 0.5 (Hair Jr et al., 2016; Henseler et al., 2009). Lastly, discriminant validity at the construct level is measured with the help of Fornell-Larcker criterion (Fornell & Larcker, 1981) and Heterotrait-Monotrait ratio of Correlations (HTMT) criterion (Franke & Sarstedt, 2018; Henseler, Ringle, & Sarstedt, 2015). The Fornell-Larcker criterion implies that the AVE of each construct should be higher than its squared correlation with any other construct. Stated clearly, the constructs correlations should be lower than the square root of the average variance extracted (Hair Jr et al., 2016; Ramayah et al., 2018). Furthermore, discriminant validity indicator is measured when every indicator loads the highest on its respective construct measure (Hair, Sarstedt, Ringle, & Mena, 2012; Henseler et al., 2009). On the other hand, HTMT was proposed by Henseler et al. (2015) for assessing discriminant validity. In simple words, HTMT is the mean of all correlations of indicators across constructs measuring different constructs. According to the suggested threshold level of HTMT by Henseler et al. (2015), when the constructs in the path model are conceptually distinct, a value of < 0.85 is regarded as warranted. Table 3.5 summarized the criteria for the assessment of the measurement model as adapted from (Hair Jr et al., 2016; Ramayah et al., 2018).

Table 3.5 Assessment of reflective measurement model criteria

Assessment	Name of Index	Description	Guidelines
Indicator reliability / Factor Loading	Indicator Loading	Measures how much of the indicators variance is explained by the corresponding latent variable.	Loading 0.708 or higher is recommended but loading > 0.7, 0.6, 0.5 or 0.4 is adequate if other items have high scores of loading to complete AVE and CR
Internal consistency	Cronbach's Alpha (CA)	Measures the degree to which the indicators load simultaneously when the latent variable increases.	CA > 0.70 acceptable CA > 0.60 satisfactory
	Composite Reliability (CR)	Measures the sum of latent variable factor loadings relative to the sum of the factor loadings plus error variance.	CR> 0.90 (Not desirable) CR> 0.70 to 0390 (satisfactory) CR> 0.60 (for exploratory research)
Convergent validity	Average Variance Extracted (AVE)	Measures the amount of variance that a latent variable component captures from its indicators relative to the amount due to measurement error..	AVE > 0.5 desirable
Discriminant validity	Cross-Loadings (at indicator level)	Requires the loading of each indicator to be higher for its designated construct than for any of the other constructs, and each of the constructs loads to be highest with its own items. It can be inferred that the models' constructs differ sufficiently from one another when the items are not cross loaded.	
	Fornell-Larker Criterion (at construct level)	Requires the latent variable to share variance with its indicators more than with any other latent variable. The AVE of the latent variable should be greater than its highest squared correlation with any other latent variable.	
	HTMT Criterion (at construct level)	HTMT is the mean of all correlations of indicators across constructs measuring different constructs.	HTMT < 0.85

Source: Hair Jr et al., (2016); Ramayah et al., (2018)

3.6.3.3 Structural Model Assessment

The structural model details the relationship between the constructs. It provides a specific detailed relationship between the endogenous (dependent) and exogenous (independent) constructs. Having confirmed the validity and reliability of the measurement model, it becomes necessary to measure the structural model (inner model) in PLS-SEM. Evaluating the structural model will help in understanding whether the data supported the proposed hypotheses expressed by the structural model. Six criteria are considered during the structural model assessment, they are the assessment of the related collinearity issues, path coefficients assessment, assessment of coefficient of determination (R^2), assessment the effect size (f^2), predictive relevance Q^2, and T value. Table 3.6 summrize the criteria of structural model assessment.

Table 3.6 Assessment of structural model criteria

Assessment	Criterion	Description	Level of Acceptance
Collinearity	Variance Inflation Factor (VIF)	VIF value of 3.3 and higher indicate a potential collinearity	Tolerance < 0.20 VIF < 3.3
R^2	Coefficient of Determination	Measures the explained variance of a latent variable relative to its total variance.	R2 Values from 0.01, 0.09, and 0.25, indicating small, 0.50 medium, and large0.75 Substantial
β	Path Coefficient (β)	Path coefficients between latent variables should be analyzed in terms of their algebraic sign, magnitude, and significance.	> -1 and < +1; Values close to +1 strong positive relation. Values close to -1 strong negative relation. Values close to 0 weak relation.
f2	Effect Size	Measures whether an independent variable has a substantial impact on a dependent variable.	f^2 > 0.02 and < .02 Small effect f^2 > 0.15 and < 0.35 Medium effect , f^2 > 0.35 Large effect
Q2			Q2 > 0 predictive relevance
T value			T value: (1.96 > t > = 1.65) significance at level = 10% (2.57 > t > =1.96) significance at level = 5% (t > = 2.57) significance level = at level =1 %

Source: Hair Jr et al., (2016); Ramayah et al., (2018)

3.6.4 Final Model Verification

The main aim of this phase is to discover the extent to which the model was applicable and useable by Malaysian SMEs. A case study research strategy was selected to carry out this study by choosing two Malaysian SMEs.

The case study research strategy was used because it is often effective for collecting data with the qualitative method (Yin, 2008). Further, a case study research strategy can help the researchers to have a better understanding of individuals, social and cultural contexts within which they live. Glaser and Strauss (2009) stressed the importance of the role of case study in understanding people's perceptions and actions, behaviors which cannot be understood only through observation or when people are questioned about them. The purpose of qualitative data collection and analysis in this study was to introduce a better level of understanding of the phenomena under investigation concerning the applicability of technological, organizational, and environmental factors in the continuance use of cloud computing services and to get a better understanding of the effect of continuance use of cloud computing services in the SMEs' organizational performance.

The methods appropriate and relevant to the collection of qualitative data are observation, interviews, and documentations, which have the aim of understanding and explaining certain social phenomena (Myers 1997). Creswell (2014) argued that interviews are the main method of collecting qualitative data; however, they can be used side by side with quantitative data to confirm or explain the results. In this study, the interview was the method used for qualitative data collection. Cases for the interviews were selected based on the findings obtained from the quantitative method. The semi-structured group interview is adopted as the primary data collection method from the selected case studies.

The requirement for qualitative data collection is the collection of data from a small number of individual or sites (Creswell, 2014). In mixed methods research, the qualitative data collection usually employs purposive sampling which involves the selection of certain units or cases ''based on a specific purpose rather than randomly'' (Flick, 2009). In purposive sampling, possible participants are selected because they yield the most relevant information for the study on the basis of known characteristics (Flick, 2009). Creswell (2014) said that the selection of participants and sites relies on people and places that give the best understanding of our central phenomenon. Moreover, Creswell (2014) stressed that the participants' choice depends on the standard of whether they are information rich or not. Therefore, the interviews with decision-makers in SMEs have the advantage that they understand the subject and have knowledge of the effect of continuance use of cloud computing services in the SMEs' organizational performance.

The researcher asked open and close ended questions (see Appendix J) to the participants to obtain the corresponded data required to get answers to the research questions. This method gave the participants the freedom to give detailed information. To get the research questions answered, semi-structured group interview interaction with participants was required to obtain answers by interviews. A qualitative analysis of the responses of participants to the semi-structured group interview questions was conducted in this study. The analysis of data whether by hand or computer is based on the amount of data, if the data are less than 500 pages, then the analysis of data would be done by hand (Creswell 2014). Thus, since the size of qualitative data in this research is small, the analysis was done manually. The result of semi-structured interviews and a detailed discussion of this phase is contained in Chapter 6 (see Section 6.7). The details of the operational framework for phase 4 were illustrated in Table 3.7.

Table 3.7 Research Operational Framework for Phase 4

Phases	Activities	Objectives	Instruments	Outcomes
Model Validation and Verification	Data Collection Technique	To conduct a survey	Questionnaire	Quantitative data collected.
	Data Analysis Procedures	To analyze the quantitative data using SPSS and (PLS), a variance-based (SEM) tool in order to test the research model in view of PLS's ability to operationalize a latent construct	SPSS v.25 and Smart PLS 3.0	A set of revised factors, tested hypothesis; a refined theoretical framework.
	Model Validation and Hypothesis testing	To validate the research model and test the hypothesis	Smart PLS 3.0	Validated research model and hypothesis results
	Model Verification	To verify the research model	Case study	Verified research model

3.7 Phase 5: Conclusion and Implications

The final phase is the last part of the current study. In this phase, the major findings based on the research objectives were concluded. The theoretical and practical contributions, implications, limitations of the research, and directions for future research were discussed in detail. Therefore, the final report of the present research was prepared. The details of the operational framework for phase 5 were illustrated in Table 3.8.

Table 3.8 Research Operational Framework for Phase 5

Phases 5	Activities	Objectives	Outcomes
5. Conclusion and Implications	5.1 Conclude major findings	To discuss the major findings based on research objectives	Final report and presentation
	5.2 Discuss contributions, implications and future work.	To discuss theoretical and practical contributions and implications To complete final report and presentation	

3.8 Chapter Summary

To achieve the research objectives, the appropriate method should be selected and justified. In this chapter, the operational research framework was presented and elaborated. Then, the unit of analysis was selected and justified. Steps such as, sampling design including the target population, sampling technique, selection criteria and justify sample size were also explained. Furthermore, the instrument development process and validation were discussed. The way of collecting data from target participants was denoted. Finally, data analysis methods and procedures for model validation and the verification process by case study strategy were elaborated.

CHAPTER 4

RESEARCH MODEL AND HYPOTHESES

4.1 Introduction

The previous chapter described in detail the overall research methodology that has been applied in this study. Chapter 2 reviewed the cloud computing services concept and the IS theories and models regarding adoption and continuance use. It also discussed the studies that examined the factors impacting the adoption and continuance use of various technologies. Moreover, it concluded that there is a need to identify the factors that affect the continuance use of cloud computing services at the organization level and its effect on organisation performance. Besides, Chapter 3 justified and outlined the operational research framework. Therefore, drawing from the literature review chapter, this chapter aims to discuss the development process of the integrated model to study the continuance use of cloud computing services and its effect on SMEs performance. The integrated model focused on what antecedent factors influence the continuance use of cloud computing services instead of the acceptance and adoption earlier stage as discussed in the previous studies (refer to Chapter 2). For this purpose, it justifies the use of the theoretical basis (ISCM model and TOE framework). This chapter also provides a further justification for the relation between TOE factors and continuance use of cloud computing services as well as continuance use of cloud computing services and organization performance. Moreover, research hypotheses will be formulated and the relationship between factors will be presented. The results of this chapter along with the detailed literature review in Chapter 2 helps to achieve the first two research objectives of this study. The developed research model will form the basis for developing the measurement tools (questionnaire) and empirical data collection and analysis. Figure 4.1 shows the research model development process.

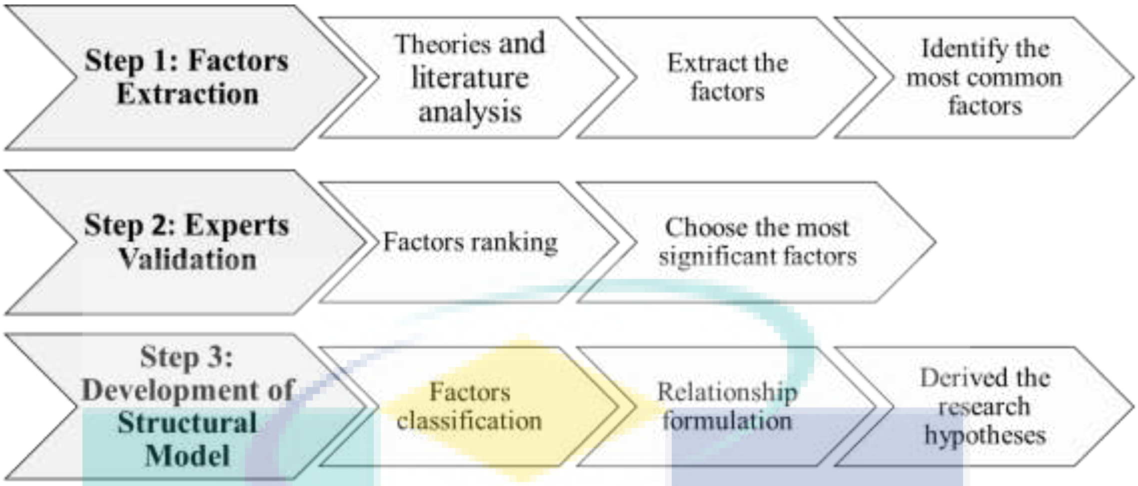

Figure 4.1 Research model development process

The chapter is divided into 4 main sections. Section 4.2 provides the factors extraction and section 4.3 presents the semi-structured interview results with experts to validate the extracted factors. The results will be used to propose the final model. Following this, the research model development process will be discussed including factors classification, formulation and derived the research hypotheses. The final section offers the proposed structural model.

4.2 Step 1: Factors Extraction

In the Chapter 2 literature review, (refer to 2.8), it has been identified that some factors influence the continuance use of cloud computing services at the organizational level. To this end, we followed the approach and criteria of Wymer and Regan (2005) in extracting the factors from the literature. Thirty (30) publications that study the factors and present germane aspects that influence cloud computing services adoption have been identified. Consequently, sixteen (16) factors were defined and classified based on the rate at which the factors were described in the literature and the research findings reported the relative importance adopted from (Wymer & Regan, 2005) as shown in Table 4.1.

Table 4.1 Factors and the resources

Factors	Studies
Relative advantage	(Abdullah & Seng, 2015; Alismaili, Li, & Shen, 2016; Alshamaila, Papagiannidis, et al., 2013; Asadi et al., 2017; Bhatiasevi & Naglis, 2016; Cheng & Bounfour, 2015; Gangwar et al., 2015; Gutierrez et al., 2015; Hsu & Lin, 2015; Lal & Bharadwaj, 2016; Lian et al., 2014; Mohammed, Ibrahim, et al., 2016; Mohammed, Mohammed, et al., 2016; Oliveira et al., 2014a; Ratten, 2015; Sabi et al., 2016; Saedi & Iahad, 2013b; Safari et al., 2015; Senarathna et al., 2016; Senyo et al., 2016; Shin, 2013; Tan & Kim, 2015; Tashkandi & Al-Jabri, 2015b; Wilson et al., 2015; Wu et al., 2013b; Yuvaraj, 2016a)
Complexity	(Abdullah & Seng, 2015; Alismaili, Li, & Shen, 2016; Alshamaila, Papagiannidis, et al., 2013; Asadi et al., 2017; Bhatiasevi & Naglis, 2016; Cheng & Bounfour, 2015; Gangwar et al., 2015; Gupta et al., 2013; Gutierrez et al., 2015; Hsu & Lin, 2015; Lal & Bharadwaj, 2016; Lian et al., 2014; Mohammed, Ibrahim, et al., 2016; Mohammed, Mohammed, et al., 2016; Oliveira et al., 2014a; Ratten, 2015; Sabi et al., 2016; Safari et al., 2015; Shin, 2013; Tashkandi & Al-Jabri, 2015b; Wu et al., 2013b; Yuvaraj, 2016a, 2016c)
Perceived security and privacy	(Akar & Mardiyan, 2016; Alismaili, Li, & Shen, 2016; Asadi et al., 2017; Gupta et al., 2013; Hsu & Lin, 2015; Lian et al., 2014; Mohammed, Ibrahim, et al., 2016; Mohammed, Mohammed, et al., 2016; Oliveira et al., 2014a; Qian et al., 2016; Ratten, 2015; Saedi & Iahad, 2013b; Safari et al., 2015; Senarathna et al., 2016; Senyo et al., 2016; Shin, 2013; Wilson et al., 2015; Yuvaraj, 2016a, 2016c)
Compatibility	(Alismaili, Li, & Shen, 2016; Alshamaila, Papagiannidis, et al., 2013; Cheng & Bounfour, 2015; Gangwar et al., 2015; Gutierrez et al., 2015; Hsu & Lin, 2015; Lian et al., 2014; Mohammed, Ibrahim, et al., 2016; Mohammed, Mohammed, et al., 2016; Oliveira et al., 2014a; Sabi et al., 2016; Saedi & Iahad, 2013b; Safari et al., 2015; Senyo et al., 2016; Tashkandi & Al-Jabri, 2015b; Wilson et al., 2015)
Cost saving	(Akar & Mardiyan, 2016; Alismaili, Li, & Shen, 2016; Asadi et al., 2017; Cheng & Bounfour, 2015; Gupta et al., 2013; Hsu & Lin, 2015; Lian et al., 2014; Oliveira et al., 2014a; Qian et al., 2016; Sabi et al., 2016; Saedi & Iahad, 2013b; Wilson et al., 2015; Yuvaraj, 2016c)
Top management support	(Alshamaila, Papagiannidis, et al., 2013; Cheng & Bounfour, 2015; Gangwar et al., 2015; Gutierrez et al., 2015; Lal & Bharadwaj, 2016; Lian et al., 2014; Mohammed, Ibrahim, et al., 2016; Mohammed, Mohammed, et al., 2016; Oliveira et al., 2014a; Qian et al., 2016; Saedi & Iahad, 2013b; Senyo et al., 2016; Tashkandi & Al-Jabri, 2015b; Wilson et al., 2015)
Competitive pressure	(Alshamaila, Papagiannidis, et al., 2013; Cheng & Bounfour, 2015; Gangwar et al., 2015; Gutierrez et al., 2015; Hsu & Lin, 2015; Lian et al., 2014; Oliveira et al., 2014a; Qian et al., 2016; Saedi & Iahad, 2013b; Safari et al., 2015; Senyo et al., 2016; Tashkandi & Al-Jabri, 2015b; Wilson et al., 2015)
Organizational & IT readiness	(Gutierrez et al., 2015; Lian et al., 2014; Mohammed, Ibrahim, et al., 2016; Mohammed, Mohammed, et al., 2016; Oliveira et al., 2014a; Sabi et al., 2016; Saedi & Iahad, 2013b; Safari et al., 2015; Senyo et al., 2016; Tashkandi & Al-Jabri, 2015b; Yuvaraj, 2016c)

Table 4.1 Continued

Factors	Studies
Firm size	(Alshamaila, Papagiannidis, et al., 2013; Gutierrez et al., 2015; Hsu & Lin, 2015; Oliveira et al., 2014a; Saedi & Iahad, 2013b; Senyo et al., 2016; Wilson et al., 2015)
Trialability	(Alshamaila, Papagiannidis, et al., 2013; Hsu & Lin, 2015; Mohammed, Ibrahim, et al., 2016; Mohammed, Mohammed, et al., 2016; Sabi et al., 2016; Safari et al., 2015)
Perceived reliability	(Akar & Mardiyan, 2016; Gupta et al., 2013; Qian et al., 2016; Shin, 2013b; Yuvaraj, 2016c)
Vendor support	(Akar & Mardiyan, 2016; Alshamaila, Papagiannidis, et al., 2013; Cheng & Bounfour, 2015; Lal & Bharadwaj, 2016; Yuvaraj, 2016c)
Perceived availability	(Shin, 2013b; Wilson et al., 2015; Yuvaraj, 2016a)
Uncertainty	(Alismaili, Li, & Shen, 2016; Alshamaila, Papagiannidis, et al., 2013; Mohammed, Mohammed, et al., 2016)
Perceived Trust	(Abdullah & Seng, 2015; Asadi et al., 2017; Bhatiasevi & Naglis, 2016)

4.3 Step 2: Experts Validation

The second step is to rank and choose the identified factors found through a literature review by conducting a semi-structured email interview with experts in information systems from academia and industry. Meho (2006) claimed that, email interview could be a feasible substitute to telephone and face-to-face interview because it makes access available to individuals who are regularly difficult to interview due to time or location. It also removes the necessity to plan appointments and transcribe the interviews and it makes interviewing more than one participant at a time possible (Meho, 2006). Additionally, email interview provides an avenue for participants to ponder and make sense of their experiences. Furthermore, email interview aids the meticulous presentation of equal questions and materials to all the examinee that potentially results in richer data. Further advantages of the email interview are: the savings in organization and travel costs (Stacey & Vincent, 2011). An email interview method was also deliberated upon as many studies based on diffusion of innovation in the Information System field (El-Gazzar, Hustad, & Olsen, 2017; Goh Huat Choon, 2006; Lin & Chen, 2012).

For the participants to participate in the study, they were invited via email invitations, the consent form and the interview questions were also sent to their email addresses (Appendix D). In this phase, 23 experts were selected to reconfirm and rank the factors which were extracted from prior studies. 14 experts from academia and 9 from industry (IT practitioners) attended with the participants during the interview. Experts with considerable and at least three years of experience were sourced for in order to set up an email interview. Table 4.2 contains further details on the types of participants. The identity information of the respondents was detached and a distinctive ID for differentiating the quotes of each participant was included for the purpose of confidentiality.

Table 4.2 Interviewees' profile

Code	Company type	Profession	IT seniority
EXP1	Industry: IT and Cloud services	Global Reliability Engineer	3-5 yrs.
EXP2	IT and Cloud services	Global Reliability Engineer	3-5 yrs.
EXP3	Academia	IT Practitioner	3-5 yrs.
EXP4	Academia	IT Practitioner	Above 10 yrs.
EXP5	Academia	IT Practitioner	3-5 yrs.
EXP6	IT and Cloud services	IT Practitioner	5-10 yrs.
EXP7	IT service provider	Site Reliability Engineer	3-5 yrs.
EXP8	IT service provider	Software Developer	3-5 yrs.
EXP9	IT service provider	Software Developer	3-5 yrs.
EXP10	Academia: IS field	Assistant Professor	5-10 yrs.
EXP11	Academia	Associate Professor	3-5 yrs.
EXP12	Academia	IS Researcher	3-5 yrs.
EXP13	Academia	Full Professor	> 10 yrs.
EXP14	Academia	Associate Professor	Above 10 yrs.
EXP15	Academia	Assistant Professor	Above 10 yrs.
EXP16	Academia	Associate Professor	Above 10 yrs.
EXP17	Academia	Associate Professor	Above 10 yrs.
EXP18	Academia	lecturer	Above 10 yrs.
EXP19	Academia	Assistant Professor	Above 10 yrs.
EXP20	Academia	Assistant Professor	Above 10 yrs.
EXP21	Academia	Assistant Professor	3-5 yrs.
EXP22	Academia	Assistant Professor	Above 10 yrs.
EXP23	Academia	Assistant Professor	3-5 yrs.

The interview questions are developed based on the existing literature. In order to continue the use of cloud computing services, the expected responses are meant to authenticate and pinpoint the utmost vital factors which affect decision makers in SMEs. For individual question in the interview, the responses are weighted the factors by 7 point Likert scale from (1 = Not at all Important, 2 = Low Importance, 3 = Slightly Important, 4 = Neutral, 5 = Moderately Important, 6 = Very Important, 7 =Extremely Important). Open-ended questions were also included in the interview survey to develop the list of validation criteria, to get more factors apart from the identified factors and to get the implicit facts from the experts. Nevertheless, there are no new factors found through the interview survey.

The foundation upon which priority is established for each factor was median rank. The median was preferred to the mean for its heftiness to the skewed distribution of the priority ratings. From the expert's viewpoints, the values allotted to each factor are from a ratio scale of 1 to 7 where 1 represents the lowest importance and 7 represent the highest.

In Table 4.3, the greater score in the precedence is the most important factor with respect to the considered criterion. As shown by the findings, experts perceived that the greatest vital factors that affect the decision makers to continue using cloud computing services in SMEs are: cost saving, top management support and relative advantage. Conceivably, cost saving is the greatest vital factor where mean reach to 6.565 and median was 7 because the limited financial and non-financial resources of SMEs and cloud services offer significant efficiencies in cost to SMEs. Additionally, decision makers cannot disregard the significance of top managers' supports to continue the use of cloud services. Relative advantage is ranked third, while Vendor support, perceived reliability and Trialability did not play the key role for the continuance use of cloud computing services.

Table 4.3 Factors ranking

No	Factors	Mean	Median	Rank	%	Remarks
1	Relative advantage	5.870	6	3	83.851	
2	Complexity	5.609	5	6	80.124	
3	Perceived security and privacy	5.522	6	8	78.882	
4	Compatibility	5.870	6	4	83.851	
5	Top management support	6.000	7	2	85.714	
6	Cost saving	6.565	7	1	93.789	
7	Competitive pressure	5.565	6	7	79.503	
8	IT readiness	5.478	6	9	78.261	
9	Firm size	4.609	5	16	65.839	Deleted
10	Vendor support	4.913	5	15	70.186	Deleted
11	Government support	5.478	6	10	78.261	
12	Trialability	5.174	5	13	73.913	Deleted
13	Perceived reliability	5.087	5	14	72.671	Deleted
14	Perceived availability	5.391	6	11	77.019	Deleted
15	Uncertainty	5.261	5	12	75.155	Deleted
16	Perceived Trust	**5.652**	6	5	80.745	

With the relevant support from by continuance use literature, Table 4.4 provides the factors that have been finalized and selected factors by the experts. It is emphasized that the factors that were selected, are also supported by the existing literature. Therefore, this justification establishes the competency and adequacy of each factor in the existing literature.

Table 4.4 Selected factors and Supported by Literature

NO	Factors	Support by continuance use studies
1	Relative advantage	(Bhattacherjee, 2001b; Ramayah et al., 2016)
2	Complexity	(Thong, Hong, & Tam, 2006; Weng & Tsai, 2015)
3	Compatibility	(Ramayah et al., 2016)
4	Perceived security and privacy	(Park, Park, Seo, & Li, 2016; Wang, 2011)
5	Top management support	(Ramayah et al., 2016; Rezvani et al., 2017)
6	Cost saving	(Martins et al., 2019)
7	IT readiness	(Gupta et al., 2013)
8	Perceived Trust	(Colesca, 2009; Kumar, Mukerji, Butt, & Persaud, 2007; Shareef et al., 2011; Sharma, Al-Badi, Govindaluri, & Al-Kharusi, 2016; Wahsh & Dhillon, 2015a).
9	Competitive pressure	(Jia et al., 2017; Sawang & Unsworth, 2011)
10	Government support	(Jia et al., 2017)

4.4 Step 3: Development of Structural Model

In this step, the process of structural model development will be discussed. The third step is divided into 2 main sub-steps factors classification and relationship formulation as well as derived the research hypotheses.

4.4.1 Factors Classification and Relationship Formulation

As for this study, the ISCM is integrated with TOE framework, were they adopted as the underlying theoretical lens to determine the continuance use of cloud computing services by the SMEs. According to Rogers (2003), the decision to keep or stop using technology after its initial adoption is the final confirmation stage where a user or a decision maker re-examine the decision to keep using the technology. The focus of ISCM is on the continuance use of technology at the individual level, however, this focus of this study is on the continuance usage of cloud computing services at the organisation level. An important difference between the continuance use of technology by organisations and individual. The decision of a organisation to adopt an innovation is not only influenced by technological factors that are related to individuals' beliefs (such as ease of use and perceived usefulness), but also, it is under the influence of both internal factors (such as organizational factors) and external survival context factors (such as environmental factors) as per the TOE framework (Tornatzky & Fleischer, 1990a). Both external factors (like technological characteristics) and environmental characteristics can play a significant role in determining its level of continuance usage (Ramayah et al., 2016). Thus, there is a need to supplement the critical factors at the organization level for the continuance use of technology, especially from the organizational perspective. In this study, the ISCM factors of continuance use of innovation were modified based on the context of cloud computing services at the organisation level and integrated with TOE framework as the underlying theoretical lens to predict the continuance use of cloud computing services by the SMEs. Although TOE and ISCM have been widely used to explain the antecedents and consequences of technology adoptions and sustained usage, few studies have integrated the two important theories together to depict innovation adoption and sustained usage (Jia et al., 2017), but no study has been reported on the context of cloud computing services and SMEs. Based on the above discussion and research gap stated earlier (refer to Chapter 2), this study integrated nine factors (refer to section 4.3) from the TOE framework (3 technological factors, 4 organizational and 2 environmental factors) that were being integrated into the ISCM to tailor it to the continues use of cloud computing services in the SMEs context. The factors of the current study are listed in Table 4.5.

Table 4.5 Type and categories of extracted factors

Category	Factor	Type
ISCM	Continuous use	Exogenous
	Confirmation	Endogenous
	Satisfaction	Endogenous \ Exogenous
Technological context	Relative Advantage	Endogenous \ Exogenous
	Complexity	Endogenous
	Compatibility	Endogenous
	Security And Privacy	Endogenous
Organizational context	Top Management Support	Endogenous
	Cost Saving	Endogenous
	IT Readiness	Endogenous
	Trust	Endogenous
Environmental context	Competitive Pressure	Endogenous
	Government Support	Endogenous

4.4.2 Derived the Research Hypotheses

In this section, the study presents hypotheses development according to what has been discussed in the previous sections and the literature review. Hypotheses work towards determining the relationships between different factors relevant to the research, and in the present study, the relationships relevant are between ISCM factors in (Bhattacherjee, 2001b), technological, organizational and environmental context in TOE (Tornatzky & Fleischer, 1990b), and the continuance use of cloud computing services as well as between the cloud computing services continuance use and SMEs performance. The formulation of the relationships between the factors and derive the hypotheses will be discussed in the following sub-sections.

4.4.2.1 Information Systems Continuance Model Factors

The ISCM hypothesized that the degree of satisfaction of an individual depends on the level of confirmed expectations and their perceived usefulness on the part of the individual, and an individuals' Continuous use of an innovation is dependent on his/her level of satisfaction and its perceived usefulness (Bhattacherjee, 2001b). Therefore, to improve the understanding of the sustainability of cloud computing services usage at the organisation level, this study hypothesizes that SMEs' degree of satisfaction with cloud computing services is determined by the level of their confirmed expectations and their relative advantage, while their continuance use of cloud computing services is determined by their degree of satisfaction and TOE factors.

In this study continues use of cloud computing services refers to refers to the intentions of SMEs decision makers to continue using cloud computing services in their organisations.

The relationship between ISCM factors and the continues use of cloud computing services are displayed in Figure 4.2.

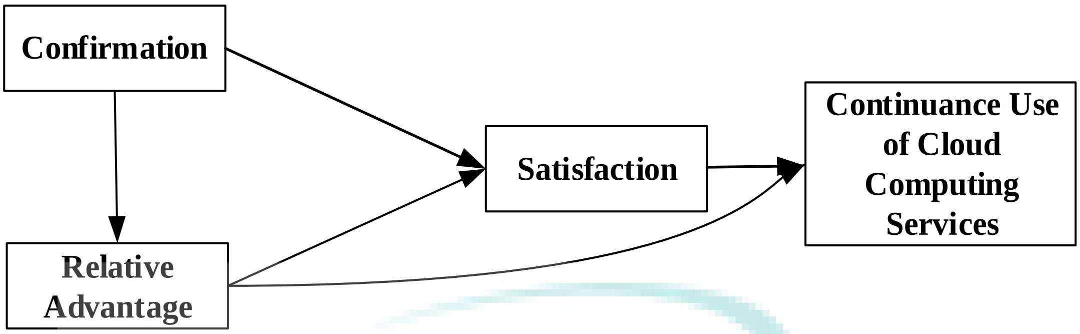

Figure 4.2 ISCM factors

i. Confirmation with relative advantage and satisfaction

Confirmation refers to the comparison between an user's perceived performance of a product or service's and his/ her perceptions pre-expectation (Oliver, 1977). User's levels of confirmation was employed by ISCM to understand the user satisfaction with a certain technology (Bhattacherjee, 2001b). Users' level of confirmation has a positive influence on their satisfaction with a technology. Users are said to have more satisfaction if their initial expectation is closer to, or lower than their actual experience. However, users are dissatisfied if the initial expectation exceeds their actual experience (Bhattacherjee, 2001b; Limayem, Hirt, & Cheung, 2007). As regards the relationship between confirmation with satisfaction and relative advantage has been confirmed by several studies in different fields. In online banking system (Bhattacherjee, 2001b) found a strong relationship between confirmation with satisfaction and relative advantage. Bøe, Gulbrandsen, and Sørebø (2015), found that, a teachers' satisfaction and perceived usefulness were significantly predicted by their confirmation to continue using information technology (IT) in higher education context.

This study assumes that a SME's expectation toward using cloud computing services, after initial acceptance and use, should not be different from their expectations before using it, if pre-acceptance expectations are confirmed and their perceived performance equals or exceed expectations. This confirmation will influence both SMEs' with cloud computing services satisfaction and relative advantages. Therefore, the level of SMEs confirmation was defined in this study as the extent SMEs expectations in cloud computing services are confirmed. Thus, this studypostulate the first two hypotheses:

H1: Confirmation has a positive impact on the relative advantage

H2: Confirmation has a positive impact on the SME satisfaction of cloud computing services

ii. Satisfaction and continuance use of cloud computing

Satisfaction in the context of information system is identified as a critical factor in which satisfaction with a certain technology tends to reinforce a user's intention to its continuance use (Limayem et al., 2007). Satisfaction factor was employed by ISCM to understand the continuance use behavior of technology innovations. Satisfaction, which is a result of the previous experience of users in IS use, plays a vital role in IS continuance intention and creates long-term consumers (Bhattacherjee, 2001b).

The role of users' satisfaction on their intention to technology continuance use has been investigated by many IS studies at the individual level. However, little effort has been devoted to investigate such relationship in the organisation level. In the study of (Walther & Eymann, 2012), the role of satisfaction in the on-demand enterprise systems has been confirmed and it has been shown that SMEs satisfaction with previous usage experience affects the decision-makers 'continuance intention to use on-demand enterprise systems. In this study, satisfaction refers to the degree SMEs decision makers are satisfied with the use of cloud computing services in their firms. Satisfaction with cloud computing services lead SMEs' either enhances the intention for cloud computing services continuance. These considerations lead to the hypothesis:

H3: Satisfaction has a significant effect on continuance use of cloud computing services

iii. Relative Advantage with satisfaction

Perceived usefulness is related to the performance of technology use and represents users' perceptions of the potential benefits of using a technology (Bhattacherjee, 2001b; Davis, 1985). In ISCM, perceived usefulness of continuance IS use was defined as the individuals' perception of the expected benefits of technology innovations use (Bhattacherjee, 2001b). According to Moore and Benbasat (1991), the notions of relative advantage and perceived usefulness are similar in the technology acceptance model (TAM) (Davis, 1989), where usefulness refers to the user's subjective probability that the use of a specific application will increase his or her job performance within an organizational context. For the purpose of this study, the perceived usefulness of ISCM was replaced with the relative advantage factor of DOI (Rogers (2003), and applied on the organisation level context. In fact, relative advantage has an influence on the rate of adoption of innovation (Rogers, 2003b), and has been often proposed as the most salient technology-related factor that influences IS post-adoption behavior in ISCM. It is used in the subsequent studies as a baseline model (Bhattacherjee, 2001b; Gutierrez et al., 2015; Moore & Benbasat, 1991; Oliveira et al., 2014a). In this study, relative advantage was defended as the extent decision-makers consider cloud computing services as a better platform compared to the other traditional systems. The more advantages that SMEs derive from cloud computing services use, the more satisfied they are, and thus, the more likely they are to sustain using them.

H4: Relative advantage has a positive impact on the satisfaction of cloud computing services

4.4.2.2 Technological Factors

The technological context is the technology adoption attribute, whether used or not or will be used in the future. It covers the relevant technologies of the organization in both internal / external and existing / new. Five factors were highlighted by Rogers (2003) that have the potential of influencing adoption, they are relative advantage, compatibility, complexity, trialability, and observability. In this study, technological context includes four factors who have effects on cloud computing services at different phases of innovations diffusion. The selection of these factors was due to their relation to both initial adoption intention and continuance intention phases.

The relationship between technological factors and the continues use of cloud computing services are displayed in Figure 4.3.

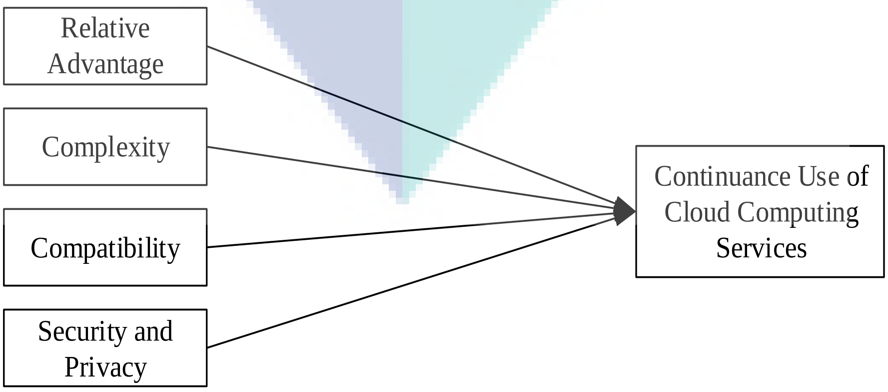

Figure 4.3 Technological factors that impact the continuance use of cloud computing services

i. Relative Advantage and the continues use of cloud computing services

Relative advantage refers to the direct and indirect benefits that cloud computing services can provide to SMEs. The relative advantage of utilizing the cloud is that it will help an organisation to accomplish tasks more quickly, reduce costs, and increase productivity and flexibility in organisations (Alkhater, Walters, & Wills, 2018). Cloud computing service has been deployed in SMEs as a flexible, scalable, and cost-effective innovation which supports enterprises to incorporate innovative business technologies within the organizational departments while reducing installation and support costs. Cloud computing services provide cost-effective solutions and services for organisations to improve their daily business operations by offering viable tools to facilitate business performance (Qian et al., 2016).

In a cross-sectional exploratory study of cloud computing services adoption in the SMEs context, found that relative advantage was very significant for decision-makers to make an adoption decision. Previous studies have also highlighted the importance of relative advantage on the continuance use. For instance, (Ramayah et al., 2016) in the context of website continues use found support for a significant correlation between perceived relative advantage of websites and SMEs decision-makers intention to continues use (Alismaili, Li, Shen, & He, 2016a; Ramayah et al., 2016). Adapa and Roy (2017) found a significant relationship between Australian consumers' continuance use behaviour and the relative advantage of Internet banking services. Al-Bakri and Katsioloudes (2015) supported the significance of the relative advantage showed consistent significance in shedding light on IT adoption. (Alkhater et al., 2018) found that RLA has a negative indirect effect on an organization's decision to adopt cloud technology. Thus, the positive perception of the benefits of having an online business presence should lead to the greater possibility of website continuance intention.

The more advantages that SMEs derive from cloud computing services use, the more satisfied they are, and thus, the more likely they are to sustain using them. Therefore, this study hypothesizes that:

H5: Relative advantage has a positive impact on the continuance use of cloud computing services

ii. Complexity and the continues use of cloud computing services

In DOI, Rogers (2003) defined complexity at the organizational level as "the degree an innovation is perceived as relatively difficult to understand and use". Meanwhile, Davis (1989) described complexity in TAM from a positive point of view and used the term 'ease of use' on the individual level as "the degree an individual believes that using a particular system would be free of physical and mental effort". According to Moore and Benbasat (1991), complexity measures the same scale of perceived ease of use in TAM (Davis, 1989) from the negative side. Rogers (2003) highlighted the likeliness of a new IS innovation adoption not happening if it is considered complex to use. The degree of complexity of new technology may also influence its rate of adoption and use, in that, where there is high complexity, organisations may not incline to its adoption or usage (Ifinedo, 2011). More importantly, the majority of SMEs consider cloud computing services as a complex and inapplicable system for their workplace (Ahmad et al., 2015). Several studies have shown that there is a significant relationship between the perceived degree of difficulty of using and understanding a technology and its continuance use (Thong et al., 2006; Weng & Tsai, 2015). In the context of this study, complexity refers to the perceived degree of difficulty of using and understanding cloud computing services from SMEs perspective. Therefore, this study hypothesizes that

H6: Complexity has a negative impact on the continuance use of cloud computing services

iii. Compatibility and the continues use of cloud computing services

Compatibility is the extent the value of an innovation is consistent with the existing beliefs, values, and needs of the potential adopter (Moore & Benbasat, 1991; Rogers, 2003a). In the related literature of innovation, the compatibility of innovation has been found as a significant factor that influences the adoption rate of innovation and that explains the use of such innovation within organizations (Cooper & Zmud, 1990; Zmud, 1982). Compatibility is considered as an important determinant of both initial adoption intention and continues use (Ramayah et al., 2016). Several prior researches on IS adoption and use within organisations found that cloud computing services adoption and usage is significantly affected by cloud computing services compatibility (Moore & Benbasat, 1991; Premkumar, 2003; Ramayah et al., 2016; Rogers, 2003a). According to

Premkumar (2003), compatibility is a crucial determinant of the adoption of IS innovation. The match or compatibility between new technology and the existing technology influences the process of adoption and sustained usage in a organisation (Ramayah et al., 2016). It is, therefore, necessary that SMEs decision-makers consider cloud computing services as compatible with their needs all along the way, not just at the initial adoption phase because cloud services are subject to change with time. Previous studies on continuance use showed that compatibility has been used to examine SMEs' continuance intention to continue using websites as a business innovation (Ramayah et al., 2016). In the context of cloud computing services, compatibility may significantly influence not only the initial adoption process but also the extent of implementation because the vendors of cloud computing services update their services permanently. This study defined compatibility as the extent cloud computing services is consistent with the existing skills, needs, and available technology of SMEs. Therefore, the continues use of cloud computing services is dependent on the level of its consistency with the present systems, attitudes, value systems, beliefs, and procedures of the users. Accordingly, this leads to the following hypothesis:

H7: Compatibility has a positive impact on the continuance use of cloud computing services

iv. Perceived of Security and privacy with the continues use of cloud computing services

The last factor in the technological context is how SMEs perceive security and privacy when using cloud computing services. Privacy and security concerns arise when SMEs decision makers feel that their organisation' data is not secure and cloud computing services vendors may monitor or disclose, transmit or sell their data to others without permission (Oliveira et al., 2014). Data security and privacy concerns have kept several organisations, customers and some government sectors from deploying cloud-based services despite the assurances given by the providers of such services (Oliveira et al., 2014; Wang, 2011). As per Salisbury, Pearson, Pearson, and Miller (2001), security is defined as the extent SMEs decision makers perceive cloud computing services as secure platforms for sensitive data storage and sharing. Privacy, on the other hand, is the extent SMEs decision makers perceive cloud computing services as a safe platform that can protect their sensitive data (Arpaci, Kilicer, & Bardakci, 2015; Wang, 2011). Being that organizations consider privacy and security concerns before adopting cloud computing services (Lu, Yu, Liu, & Wei, 2017), perceived privacy and security were combined to one factor in this study as recommended by (Gangwar & Date, 2016; Gupta et al., 2013). Previous studies have examined the relationship between perceived privacy protection and continuance intention (Lu et al., 2017) in the mobile shopping perspective using a smartphone. Furthermore, the indirect effect of security concerns and continuance intention was studied by another study in the context of SaaS (Martins et al., 2019). Another study also, found a positive the relationship between the adoption, and utilisation of mobile supply chain management and perceived privacy and security in the manufacturing organizations' context. (Chan & Chong, 2013). More related to continuance use intention, Park et al. (2016) analyzed the factors influencing individual on the use of cloud computing services and found a significant influence of security factor on the continues use of cloud computing services. Moreover, in the context of SaaS, (Wang, 2011) conceptualized the relationship between privacy and security compliance and continuance use. Accordingly, it is proposed that:

H8: Perceived of Security and privacy have a positive impact on the continuance use of cloud computing services.

4.4.2.3 Organizational Factors

Organizational context refers to the characteristics of an organization, including its size, the complexity level of its managerial structure, its human resources, amount of slack resources, the degree of formalization, and connectivity among employees (Tornatzky & Fleischer, 1990a). For instance, Zhu et al. (2003) noted that larger organizations may have more financial powers to embark on IT adoption and innovation; however, Shefer and Frenkel (2005) believed that smaller organizations are more conservative and more intolerant to innovative technologies and opinions. The important organizational factors that have been repetitively mentioned include top management support, cost saving, IT readiness and perceived trust. Therefore, in this study, these four factors were deemed to be the major factors that predict the continues use of cloud computing services by SMEs. Regarding the organizational context, the cost, financial barriers, and financial resource factors are similar variables, while IT readiness, availability, and technology competence, and employee IT knowledge are similar. The relationship between environmental factors and continues use of cloud computing services are displayed in Figure 4.4.

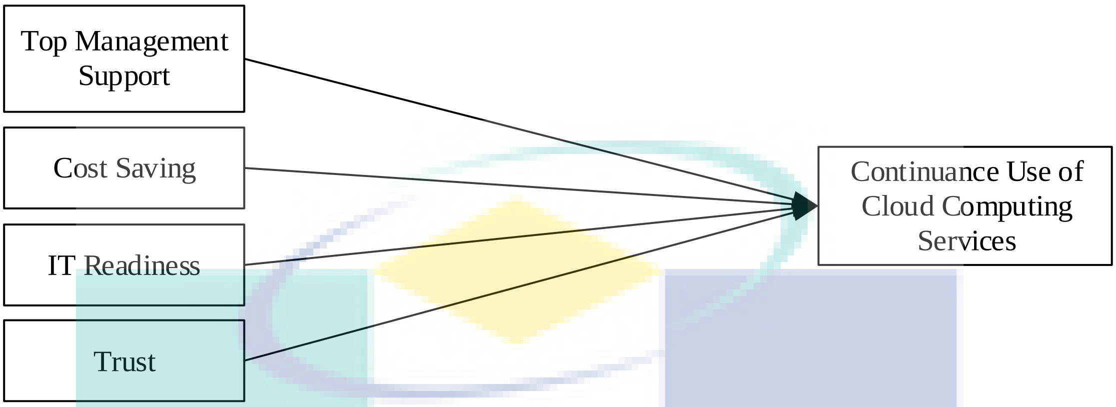

Figure 4.4 Organizational Factors that Influence Continuance Use of Cloud Computing Services

i. Top management support and the continuance use of cloud computing services

Top management support has been consistently found to be a critical factor for the successful adoption of technology and its usage in the organisations (Alshamaila, Savvas Papagiannidis, & Li., 2013). Wattal, Racherla, and Mandviwalla (2009) defined management participation as the level the executive management promotes innovation and use of new technologies. More specifically, the vision, commitment, and participation of management have been shown to be major variables in successful IS implementation and adoption (Sanders & Courtney, 1985) and in innovation adoption (Lee & Kim, 2007; Premkumar & Ramamurthy, 1995; Ramamurthy, Premkumar, & Crum, 1999; Zmud, 1984). Works on innovation, such as Gatignon and Robertson (1989) and (Tornatzky & Fleischer, 1990a), indicate that top management has a positive effect on the adoption of new technologies. Top management support is among the commonly studied organizational aspects in the innovation or IS adoption literature (Gangwar et al., 2015; Oliveira et al., 2014). Empirical studies on IS implementation reveal that the extent of the success of IS adoption is influenced by the support received from top management (Akkermans & van Helden, 2002; Caldeira & Ward, 2003). In addition, other studies such as Ives and Olson (1984) and Kwon and Zmud (1987) reported that top management support has a positive effect on innovation adoption. Along similar lines, top management participation has been found to have a positive influence on adoption behavior in relation to computer-assisted software engineering (CASE) tools in IS departments (Rai &

Patnayakuni, 1996). Moreover, Cho (2010) believed that it is crucial for senior executives to set up a reward system to work towards boosting the use of the new system among staff in order to show their support for a new IS (e.g., an e-document management system (EDMS)). The author argues that if this is realized, the performance of not only the individual employee would be enhanced, but of the whole company. Cho (2010) concluded that the advocacy of top management is the top factor influencing new technology adoption. Organisations' decision makers are a powerful source of influence shaping the post-adoption attitudes and behaviors of users and the success of cloud computing services in their SMEs (Alkhater et al., 2018; Gangwar et al., 2015; Oliveira et al., 2014a). However, studies that examined the role of top management support in adopting innovations and their sustained usage are still limited (Ramayah et al., 2016; Rezvani et al., 2017). A positive relationship exists between top management and continues use of cloud computing services because the decision makers in SMEs have a great influence on decisions (Ramayah et al., 2016). Therefore, the personal opinion and intuition of SMEs decision makers play a significant role in strategic decision-making with respect to the extent of technology use. CEOs with more favorable attitudes are often open and receptive to more investment in cloud computing services. Thus, there is a need to ensure CEOs develop a positive attitude towards innovation; they should also be ready to continue adopting and using cloud computing services and should see it as a secure, compatible and beneficial platform which is compatible and relatively easy to use. To increase the continues use of cloud computing services in SMEs, the support from top management is essential because the adoption and continues use decision do not only come from IT staff. Thus, the decision of a sustained cloud computing service usage requires support from SMEs top management and decision-makers. Hence, it is proposed that:

H9: Top Management Support has a positive impact on the continuance use of cloud computing services

ii. Cost saving and the continuance use of cloud computing services

The second organizational factor is cost saving; cost saving plays an important role in sustaining usage of cloud computing services in organisations. Cost saving refers to the extent users perceived the total cost of using cloud computing services (Gupta et al., 2013). Cost saving is one of the main reasons that organizations switch to cloud computing services because cloud computing services can cut the cost of building an organizations' system (Fernández, Peralta, Benítez, & Herrera, 2014). Cloud computing services come with a new development platform to overcome legacy systems issues in an easy and cost-efficient way (Chen, Chen, & Lee, 2018). Organizations benefit more from cloud computing services due to the cost savings associated with up-front infrastructure acquisition (Abdollahzadegan et al., 2013). Cloud service providers can offer services to organizations based on a pay-as-you-go cost structure model (Yeboah-Boateng & Essandoh, 2014). Therefore, organizations can outsource their IT resources or in other words, can pay for dynamically accessing their resources outside their premises and this can save cost in terms of subscription, low upfront cost, data storage, cost control via scalability, and resource elasticity (Alismaili, Li, et al., 2016). This reduces cost because of the nature of the subscription model and the avoidance of software installation (Martins et al., 2016). The start-up cost hindered SMEs from fully adopting technology innovations. Cloud computing services offer low start-up expenses and help SMEs to reduce the cost requirements for software procurement, experimentation, and implementation (Ali, Soar, & Yong, 2016). Cloud computing services is a potential commercially viable option for SMEs owing to its flexibility and pay-as-you-go cost structure (Safari et al., 2015). SMEs can also benefit from cloud computing services by eliminating system maintenance and routine upgrades, and by decreasing operational costs via paying only for functional consumption and the services they use. They can also benefit from reducing or deploying IT staff (Chen et al., 2018). Although cost saving is one of the factors considered at the initial stage of adopting an innovation, organisations can only confirm or rethink their initial expectations regarding its benefit after having greater experience with technology through its use. If cost saving is truly confirmed, the use of the service may be sustained in the organization. Cost saving was examined as an indirect predictor of organisations' continuance intention on SaaS use by (Martins et al., 2019). This study proposes the testing of the following hypothesis:

H10: Cost saving has a positive impact on the continuance use of cloud computing services

iii. IT Readiness and the continuance use of cloud computing services

The term IT readiness implies that clear IT-related components are in place and employed for the fulfilment of business objectives and for the relaying of information for informed decisions (Al-Somali, Gholami, & Clegg, 2015). IT readiness is considered to be one of the organizational contexts that act as a determinant of cloud computing services continuous use by SMEs. In this context, the term IT readiness is defined as the level to which technology infrastructure, relevant systems, IT human resources, and technical business skills (Zhu, Kraemer, & Xu, 2006) can reinforce the continuous use of cloud computing services. This infrastructure comprises technology, as well as IT-related human resources which are required if a company is desirous of integrating new technology into its value chain (Shah Alam, Ali, & Mohd. Jani, 2011; Zhu & Kraemer, 2005). The IT readiness factor is considered to be very significant in predicting technology diffusion process. IT readiness has a key role to play in predicting innovation diffusion and this issue has been explored by several empirical studies (Duan, Deng, & Corbitt, 2012; Rahayu & Day, 2015; Shah Alam et al., 2011). Different terms have been used in describing this factor; for example, many studies use IT readiness (Low et al., 2011; Oliveira et al., 2014a; Zhu, Kraemer, et al., 2006) while others use employees' IT knowledge (Ahmad et al., 2015; Ramayah et al., 2016) or organizational IT competence (Salwani, Marthandan, Norzaidi, & Chong, 2009; Wang, Li, Li, & Zhang, 2016). Studies on IT readiness report that its existence relies on two fundamental elements, namely, technical readiness (technological infrastructure) and the knowledge of IT personnel (human resources that bring about IS innovation adoption) (Shah Alam et al., 2011; Wang & Tsai, 2002; Zhu & Kraemer, 2005). Al-Somali et al. (2015) showed that IT readiness can be a source of efficiency. On the other hand, lack of skills and technical knowledge among employees can lead to a delay in the adoption of innovation and its implementation until the employees acquire the necessary technical expertise (Hung, Hung, Tsai, & Jiang, 2010). In a similar vein, Pan and Jang (2008) reported that organizational IT readiness has a positive effect on the adoption of various technological innovations by organisations. This includes the adoption of EDI and other enterprise applications (Ramdani, Chevers, and Williams (2013), B2B e-marketplaces (Stockdale & Standing, 2004), as well as cloud computing services (Alshamaila, Savvas Papagiannidis, et al., 2013). The main premise is that organizational IT readiness is capable of providing a significant competitive advantage to a organisation and that its presence differentiates organisations in terms of their performance (Janita & Chong, 2013; Shahzad, Luqman, Khan, & Shabbir, 2012). The continuance use of cloud computing services leads to enhance IT readiness in an organization (Gupta et al., 2013). Cloud computing services can become a vital part of the value chain of any SME only if it has favorable infrastructure and technical skills (Alshamaila, Papagiannidis, et al., 2013; Oliveira & Martins, 2010). Hence, it is proposed that:

H11: IT readiness has a positive impact on the continuance use of cloud computing services

iv. Trust and the continuance use of cloud computing services

Trust is an essential mechanism for building and maintaining relationships. Ba and Pavlou (2002) defined trust in an online environment as "the subjective assessment of a party that another party will perform a particular transaction according to his or her confidant expectations, in an environment characterized by uncertainty". Trust is also described as the belief by the trustor that the trustee will behave in a positive way (Morgan & Hunt, 1994). If the trust is not properly realized, the grantor will reduce the motivation to continue the relationship (Yang & Chou, 2015). This type of trust is critical in successful organisation alliances because trust is linked to the trustor's belief that the latter will not do harm to the former, and that negative consequences are thus prevented (Yoo & Kim, 2018). The lack of trust is considered as one of the biggest barriers that prevent individuals and organisations from adopting and using technology innovations (Al-Sharafi, Arshah, Abo-Shanab, & Elayah, 2016). Over the years, technology trust has been extensively studied in the literature and it has been acknowledged as the major element in the relationships between individuals and organizations (Colesca, 2009; Hong & Cha, 2013; Kumar et al., 2007; Shareef et al., 2011; Sharma et al., 2016; Wahsh & Dhillon, 2015a). In the study conducted by Jianyuan and Chunjuan (2009), the authors stressed the importance of mutual trust in the context of B2B technologies' adoption as it boosts organisations' adoption investment, and prevents them from taking part in opportunistic behaviors. Moreover, since the TOE model lacks intra-organizational factors like technology trust (Sila, 2013), thus, this study includes a trust to rectify this drawback. Trust is vital for the relationship between cloud computing service providers and their clients; it plays a critical role in deciding the continuous use of cloud computing service in the organisations because it reduces uncertainty (Akter, Ray, & D'Ambra, 2013; Yoo & Kim, 2018). Alkhater et al. (2018) found that, perceived trust will positively affect an organisation's intention to adopt cloud computing services. This study considered perceived trust in cloud computing services as one of the four primary dimensions in organizations influencing the SMEs to continues use of cloud computing services. Previous literature has shown that long-term, inter-organizational relationships are built on mutual trust (Colesca, 2009; Kumar et al., 2007; Shareef et al., 2011; Sharma et al., 2016; Wahsh & Dhillon, 2015a). In this regard, we defined trust as the SMEs' perception of cloud computing services as a useful and trusted service provider that will not exploit them (Shareef et al., 2011). Therefore, we hypothesize that:

H12: Perceived Trust has a positive impact on the continuance use of cloud computing services

4.4.2.4 Environmental Factors

The environmental context is related to the organization's environment; it is related to the surrounding factors that can be influential in IT innovations adoption decisions. For this study, two key factors within the environmental context were competitive pressure and government support.

The environmental context includes the characteristics of an environment, such as its industrial size and structure, its competitors, and the applicable government policies and regulations (Tornatzky & Fleischer, 1990a). The decisions of a organisation can be directly affected by the external environment (Alshamaila, Papagiannidis, et al., 2013). The environmental context identifies the structure of the industry, the competitors, and the regulatory environment (Tornatzky & Fleischer, 1990a). In this study, the environmental context was represented by the competitive pressure and government support factors. The relationship between environmental factors and continues use of cloud computing services are displayed in Figure 5.4

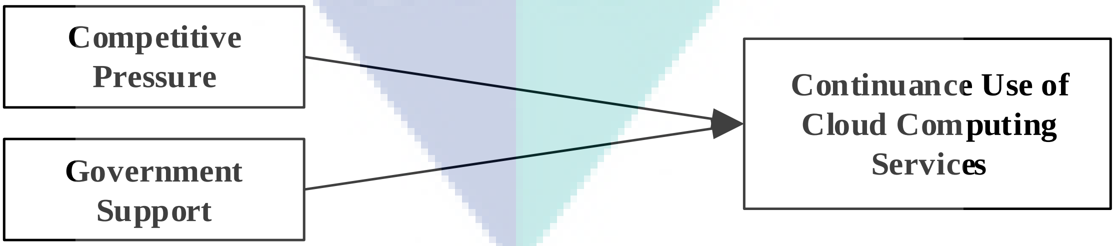

Figure 4.5 Environmental factors that influence continues use of cloud computing services

i. **Competitive Pressure and the Continuance Use of Cloud Computing Services**

Competitive pressure was defined by Oliveira and Martins (2010) as the degree of pressure an organisation feels from competitors within the sector. It is a strong incentive towards new relevant technologies adoption Organizations in a competitive environment must always assess new technological advances and possibly adopt them to gain competitive advantages. The decision of a organisation to adopt technology can be affected by the relationship between the organization and its trading partners, competitors, government, and pressure from trading partners (Tornatzky & Fleischer, 1990a). For instance, organizations may be compelled to adopt new technologies due to intense competition in the industry (Doolin & Troshani, 2007). SMEs are constantly pressurized by the rate of globalization and the rapid growth of IT and these have affected the customers' needs and preferences which are continuancely changing with globalization. The increasing number of competitors and the sustained expansion of IT can force SMEs out of a specific sector; however, their reactions will mainly depend on how they use and integrate business intelligence and information in their products and services (Ramayah et al., 2016). Competitive pressure influences the diffusion of IT innovation, especially when organisations perceive the likelihood of such technology to enhance their competitive position and help to improve their performance. Competitive pressure in the IT innovation context mainly refers to peer pressure to use an innovative technology (Jia et al., 2017). Competitive pressures are the outcome of organizations' response to uncertainty and reflect the extent that an organization can be affected by competitors in the market (Mohtaramzadeh, Ramayah, & Jun-Hwa, 2018). Previous empirical studies have reported competitive pressure as an important factor that drives IT innovations adoption and use. Sawang and Unsworth (2011) for instance, stated that pressure will be positively related to technology adoption for the SMEs but not for the large organisations. Jia et al. (2017) also investigated competitive pressure as a factor that influences continuance use of E2.0 applications in organizations. The study reported that organizations are more likely to keep using E2.0 when they recognize that more of their competitors have increased competitive advantages and have developed marketing dynamic potential via the continuance use of E2.0. These competitive pressures will force SMEs to adopt and continues using cloud computing services to provide better services and gain strategic advantages. Hence, it is proposed that:

H13: Competitive pressure has a positive impact on the continuance use of cloud computing services

ii. Government support and continuance use of cloud computing services

Government support is the second factor in the environmental context which can influence SMEs decision makers on continuous use of cloud computing services. As per Oliveira et al. (2014a), government support refers to the different types of help given by the government to encourage the use of IT innovation by organisations. The role of government has become more important for SMEs who have limited access to financial resources. The government can provide specific incentives such as subscription fees to motivate SMEs to adopt and use cloud computing services. SMEs depend mainly on government support especially in the areas of cloud services expertise and other services to run their business. This implies that they lack entrepreneurial orientation, IT capabilities, and cloud computing know-how. Thus, the performance of SMEs can either be improved or decreased by the use of cloud computing services (Salleh & Hussin, 2016).

Governments can facilitate and support relevant actions for cloud computing services adoption and continuance use through instituting relevant laws, providing specific incentives such as subscription fees, and adopting IT infrastructure, and creating a skilled workforce, especially in the developing countries (Jia et al., 2017). Without government action, it would be more risky for SMEs to make decisions to adopt and use IT innovations owing to their size and lack of resources, making them depend more on external support compared to the other companies (Ghobakhloo, Hong, Sabouri, & Zulkifli, 2012). Thus, organisations often require government support during the process of IT innovations adoption and development, especially in developing countries. Earlier studies have confirmed government support and incentives as a significant factor that positively affects the decision to adopt technology in organizations (Mohtaramzadeh et al., 2018; Oliveira et al., 2014a; Saedi & Iahad, 2013a; Scupola, 2003). Therefore, the following hypothesis is proposed:

H14: Government support has a positive impact on the continuance use of cloud computing services

4.4.2.5 The Relation between Continuance Use and SMEs Performance

The performance of the organization is deemed to be an important business outcome that is gauged based on the expected outputs. The factor is influenced by the IT development and it faces changes in the business environment. Enhanced organizational performance has its basis on the increasing development of ICTs. In general, organizational performance was described by Jahanshahi et al. (2012) as acquiring optimum enhancements in terms of growth in ICT in the context of business and trade. In previous studies, independent variables like productivity, market value, profitability, size and costs were considered to possess explanatory power in the performance examination (Hamad, 2014). In regards to this, the businesses' market values form a basic element of their performance measurement. Meanwhile, profitability has been extensively considered as indicator of enterprise performance and also, with the increase in enterprise size, management becomes more experienced.

While, the adoption of cloud computing services in SMEs has positive implications for decision makers, stakeholders, and consumers, there are limited studies on the impact of continues use of cloud computing services technology. Furthermore, findings from prior studies revealed that the effects of ICT adoption on the performance of firms is either negative or positive hence the results are inconclusive (Al-Dhaafri, Al-Swidi, & Yusoff, 2016), where a positive significant association between ICT usage and organizational performance was reported by prior researchers (Gunasekaran et al., 2017; Masli, Richardson, Sanchez, & Smith, 2011; Pinho & Ferreira, 2017). Conversely, other researchers have found a negative correlation between ICT usage and organisations performance (Anand et al., 2013; Irani, 2010; Perez-Mendez & Machado-Cabezas, 2015). The contradictory results on the impact of IT initiative including cloud computing services usage on organizational performance call for researchers to perform more in-depth research to examine the relationship between IT usage and organizational performance in emerging economies or different context. Therefore, as shown in Figure 4.6, this study investigates the impact of cloud computing services continuance usage on SMEs performance by exploring the efficient use of ICT in SMEs to increase the overall organizational performance, financial and non-financial (Alshamaila, Papagiannidis, et al., 2013). Therefore, based on the proceeding argument we hypothesized that;

H15: Continuance use of cloud computing services has a positive impact in the SMEs performance

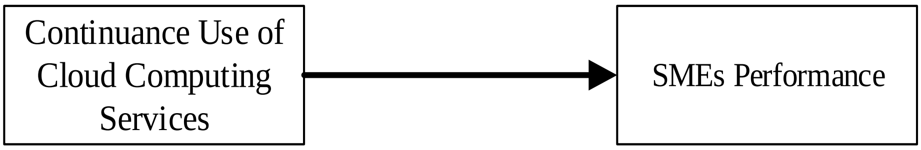

Figure 4.6 The relation between continues use and SMEs performance

4.4.3 Structural Model

Resulting from the above discussion, the structural model was derived by integrating the nine factors of the TOE framework into the ISCM to tailor it to the continuance use of cloud computing services in the SMEs context. The structural model was designed to determine the extent to which factors used in cloud computing services adoption at the organization level and ISCM factors affect the cloud computing services continuance use at the SMEs context and how this use impact their performance. Figure 4.7 shows fifteen relationships (depicted by path diagrams) that correspond with the stated hypotheses for this study.

As illustrated in Figure 4.7; the first four hypotheses (H1, H2, H3 H4), represent the relationship between ISCM factors. H5, H6, H7 and H8 represent the relationship between technological factors and continues use of cloud computing services. The relationship between organizational factors and continues use of cloud computing services are represented in hypothesis H9, H10, H11 and H12. H13 and H14 represent the relationship between environmental factors and continues use of cloud computing services. Finally, the relationship between continues use of cloud computing services and SMEs performance present in H15.

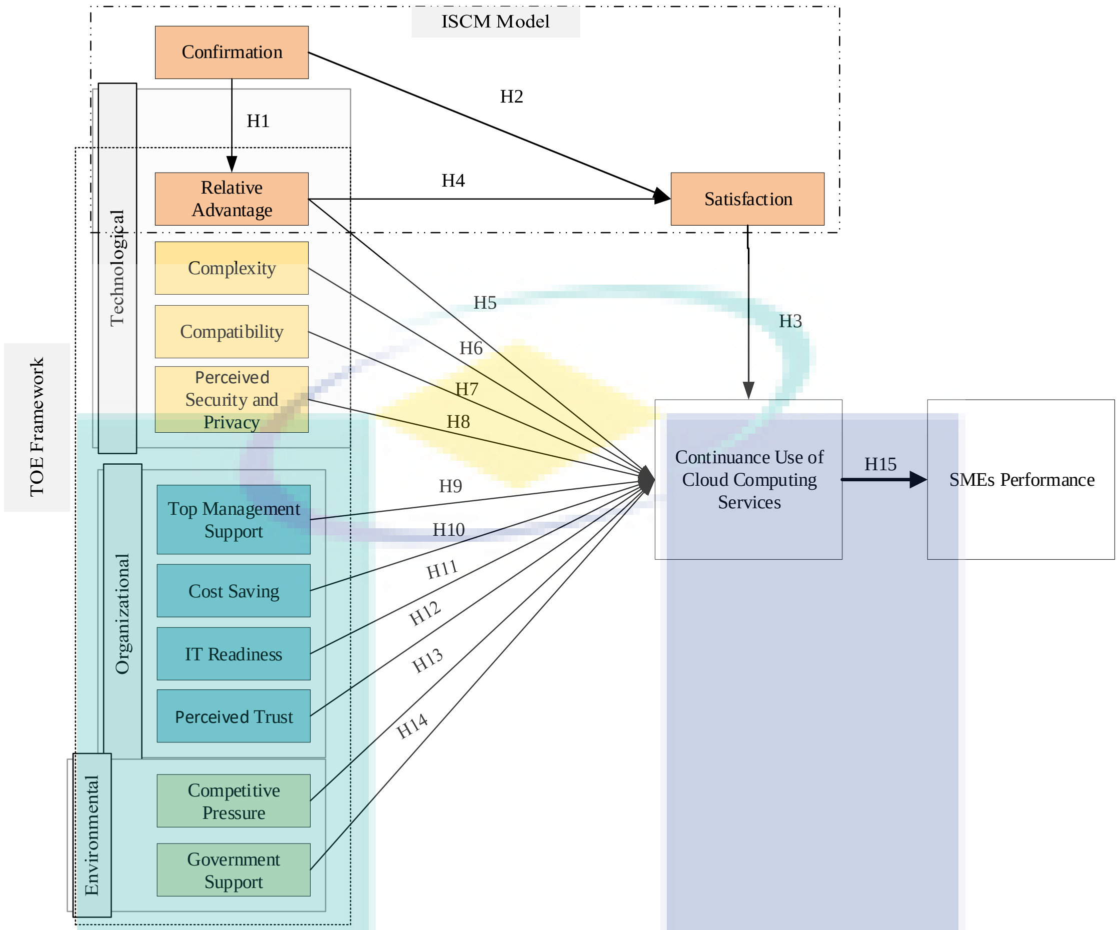

Figure 4.7 The Developed Model

4.5 Chapter Summary

The main aims of this chapter were to validate the extracted factors from literature and to design a structural model that determine the extent to which factors that affect SMEs to continuous use of cloud computing services. In details, the ISCM model was integrated into the factors validated by experts and classified based on TOE framework to propose the integrated theoretical framework for continuance use of cloud computing services and its impact on Malaysian SMEs Performance. In terms of TOE framework, factors which influence the continuance use of cloud computing services were divided into three different categories which were technology, organization, and environment. Lastly, in-depth discussion of 14 constructs was presented and associated 15 hypotheses are developed. The results of this chapter along with the detailed literature review in Chapter 2 achieved the first two research objectives of this study and will be used as a guideline for the next research phases to develop the measurement model and conduct the pilot study.

CHAPTER 5

QUESTIONNAIRE DEVELOPMENT AND PILOT STUDY

5.1 Introduction

To test the hypothesized relationships between the constructs proposed in the previous chapter, a reliable and valid measure for each construct must first be developed. This chapter outlines the instrument development process, and instrument validation for the final data collection. Thus, the main aim of this chapter is to design a reliable and valid instrument for predicting the continues of cloud computing services usage in Malaysian SMEs.

The developed instrument based on Information Systems Continuance Model (ISCM) and Technology–Organization–Environment(TOE) framework. This main aim was achieved by a systematic three-step process include defining theoretical constructs and items creation, instrument reviewing process, measurement reviewing process, and measurement testing. Figure 5.1 shows the process of instrument development and validation.

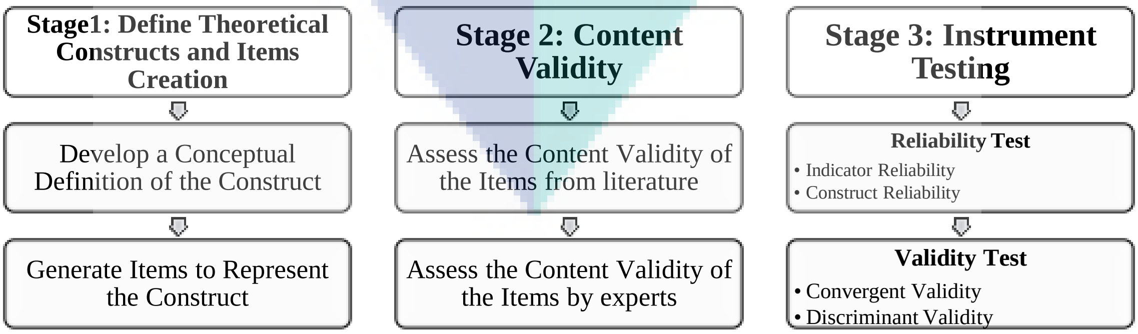

Figure 5.1 Research process of instrument development and validation

5.2 Stage 1: Define Theoretical Constructs and Items Creation

In this stage, the factors and their definitions were identified before generating the items for their measurement which can provide a similar measure of the respective items from the existing instruments. This stage mainly aims at ensuring the content validity through an appropriate selection of the construct items; it also aims at ensuring the distinctiveness of the construct from the other related constructs. To this end, fourteen factors were derived from the TOE framework and ISCM as discussed in Chapter 4. The constructs' definition is a vital step before the items' creation. A conceptual definition of all the constructs was reviewed and identified based on the selected theories and the literature, as shown in Table 5.1. As well, the context of this research, which is SMEs, was accounted. The existing literature was comprehensively reviewed to generate the list of the items and determine the number of items for each construct as showen in Table 5.1. During the items' extraction, care was taken to ensure that only items which obtained the highest levels of validity and reliability from previous research were extracted and used as items for this measurement instrument. A total of 76 items were determined for the 14 constructs (as will be discussed in the next sub-sections). The generated items were organized into groups to measure a particular dimension of a construct. All the constructs in the model were operationalized as reflective. The created items of the instrument were built based on five-point Likert scale (where 1 represents strongly disagree and 5 represents strongly agree) which was recommended when implementing self-administered surveys and has been used widely in the IS context (Hair Jr et al., 2016). The operational definitions of the constructs, their number of items, and the related sources of each construct used in this research were shown in Table 5.1.

Table 5.1 Instrument Constructs and their Definition and Dimensions

Constructs	Definition	# Items	Dimensions	Sources
Continuance use of Cloud Computing Services	SMEs decision makers' intentions to sustained using cloud computing services in their organisations.	6	Recommendation to beers; worthy usage - Continue to use – Need - Intention to continuous use	(Bhattacherjee, 2001b)
Satisfaction	The perception of SMEs satisfaction and opinions of cloud computing services.	4	Satisfying-Pleasing-Contenting- Delightful	(Bhattacherjee, 2001b)
Confirmation	The extent to which the SMEs expectation is confirmed in the cloud computing services	4	Usage expectation-Benefits expectation-Support -expectation-Confirmation expectation	(Bhattacherjee, 2001b)
Relative Advantage	The advantages that the SMEs is recipient of through their adoption and use of cloud computing services.	5	Business improvements-Task accomplishment-Quality improvements-Increase productivity-Accessibility - Overall advantages	(Moore & Benbasat, 1991; Rogers, 2003a)
Compatibility	The extent to which the cloud computing services fits an organization's existing values, past practices, and current requirements.	6	Compatibility with existing-technology-Integration-Consistency-Technology fit-Easy to export/import data,-Compatibility with organisation's value and culture	(Moore & Benbasat, 1991; Rogers, 2003a)
Complexity	The perceived degree of difficulty of using and understanding cloud computing services.	5	Manageability-Easy integration--Safety of computers and data-Easy to learn-Degree of skill	(Moore & Benbasat, 1991; Rogers, 2003a)
Perceived Security and Privacy	The degree of cloud computing services that is deemed secure and private compare to other computing paradigms.	5	Data security- Security related to cloud provider- Data privacy and confidentiality	(Gupta et al., 2013)
Top Management Support	Backing and commitments by highest ranking executives for adoption and continuance use of cloud computing services.	5	Commitment of Resources- Commitment of leadership and engages- Risk attitude-Understandability -Desirability	(Garrett Jr & Neubaum, 2013)
Cost Saving	Cost reduction attained using cloud computing services has a favorable effect on the organizations usage and cloud computing services adoption.	5	Operational cost- Implementation cost-Purchasing cost- Maintenance costs	(Gupta et al., 2013)

Table 5.1 Continued

Constructs	Definition	# Items	Dimensions	Sources
IT Readiness	The level to which technology infrastructure, relevant systems, IT human resources, and technical business skills can reinforce the continuous use of cloud computing services in SMEs.	5	Sufficient technological resources - Unrestricted access to computer - High bandwidth- Skilled employees	(Chan & Chong, 2013; Oliveira & Martins, 2010; Zhu, Kraemer, et al., 2006)
Trust	SMEs view perceive cloud computing services useful in the event where they trust the service provider and feel that they are not being exploited.	5	Expect functionality -Trustworthy - Rights protect - Privacy and integrity	(Shareef et al., 2011)
Competitive Pressure	The pressure perceived by SMEs decision makers that competitors have achieved substantial competitive advantage by using cloud computing services.	6	Market share - Competition - Competitive advantages Impressive - Subjective norm – Mimetic pressure	(Gatignon & Robertson, 1989)
Government Support	The requirement of governmental support to encourage SMEs adopt and use cloud computing services.	5	Incentives - Procurement policies - High tech provision - Regulation and laws - Overall government support	(Saedi & Iahad, 2013a)
SMEs Performance	the ability and capacity of SME to realize and achieve its objectives through the efficient and effective use of cloud computing services.	10		(Akter et al., 2016; Lo et al., 2016a; Wamba et al., 2017)

5.2.1 Information systems continuance model measurement scales

The ISCM inclose of four factors, namely continuance use, satisfaction, confirmation and relative advantage. The measurements of the above factors were adapted from past studies in the relevant literature that will discuss in the following subsections.

5.2.1.1 Continuance use of cloud computing services

Continuance use of cloud computing services refers to the intentions of SMEs decision makers to continue using cloud computing services in their organisations. Continuance use construct was developed from (Bhattacherjee, 2001b). Based on existing findings, to operationalize continuance use of cloud computing services, the following items were identified in this study as relevant for cloud computing services: the actual and continuance use of cloud computing services was measured in this construct based on the willingness of SMEs decision makers' to continuance use of this technology and its recommendation to their peers. Continuance use of cloud computing services items is listed in Table 5.2, along with their sources.

Table 5.2 Continuance Use of Cloud Computing Services Construct Measurement Items

Code	Items	Sources
CUCC1	We recommend the use of cloud computing services to peers.	(Bhattacherjee, 2001b)
CUCC2	It is worth using cloud services in our organisation.	
CUCC3	We will continue to use the cloud computing service in the future.	
CUCC4	Our organisation need for the cloud computing services will constantly increase in the future	
CUCC5	In the future, still, need to use cloud computing services to support our organisation work/task.	
CUCC6	We intend to continue using cloud computing services rather than discontinue using it.	

5.2.1.2 Satisfaction with cloud computing services

Satisfaction construct was employed by ISCM to understand the continuous use behavior of technology innovations (Bhattacherjee, 2001b). In this study, satisfaction refers to the degree SMEs decision makers are satisfied with the use of cloud computing services in their organisations. The satisfaction construct captures the decision-making to continuous use of cloud computing services in SME (Walther & Eymann, 2012). The SMEs satisfaction with cloud computing services was represented by four dimensions: satisfying, pleasing, contenting, and delightful. These four items, their sources, and their corresponding code names were listed in Table 5.3.

Table 5.3 Satisfaction Construct Measurement Items

Code	Satisfaction	Sources
STS1	Our organisation experience of cloud computing services use was very satisfying.	(Bhattacherjee, 2001b)
STS2	Our organisation experience of cloud computing services use was very pleasing.	
STS3	Our organisation experience of cloud computing services use was very contenting.	
STS4	Our organisation experience of cloud computing services use was absolutely delightful.	

5.2.1.3 Confirmation of cloud computing services

Confirmation was defined as the extent SMEs expectations in cloud computing services are confirmed. This study identified four items from (Bhattacherjee, 2001b; Jia et al., 2017) that must be examined for the operationalization of the confirmation of cloud computing services quality. These items include usage expectation, benefits expectation, support expectation, and confirmation expectation. These four items, with their sources, and their corresponding code names were listed in Table 5.4.

Table 5.4 Confirmation Construct Measurement Items

Code	Confirmation	Sources
CNF1	Our experience with using cloud computing services was better than what we expected.	(Bhattacherjee, 2001b; Jia et al., 2017)
CNF2	The benefits with using cloud computing services were better than we expected.	
CNF3	Cloud computing services support our organisation more than expected.	
CNF4	Overall, most of our expectations from using cloud computing services were confirmed.	

5.2.1.4 Relative advantage of cloud computing services

In this study, relative advantage was defended as the extent decision-makers consider cloud computing services as a better platform compared to the other traditional systems. To operationalize relative advantage construct, this study measured the degree cloud computing services is perceived as better than the traditional on the perspective of SMEs decision-makers in terms of business improvements, task accomplishment, quality improvements, increased productivity, accessibility, and overall advantages. These five items, their sources, and their corresponding code names were listed in Table 5.5.

Table 5.5 Relative Advantage Construct Measurement Items

Code	Relative Advantage	Sources
RLA1	Use of cloud computing services improves our business operations more than traditional technology.	(Moore & Benbasat, 1991; Rogers, 2003a; Rogers, 2003b)
RLA2	Cloud computing services allows us to accomplish tasks more quickly and manage business operations in an efficient way.	
RLA3	Cloud computing services improves the quality of operations and increase productivity.	
RLA4	Cloud computing services enable employee and stakeholders to access information anywhere, anytime.	
RLA5	Cloud computing services have more advantages than disadvantages.	

5.2.2 Technological context measurement scales

The technological factors that contributing to the continuance use of cloud computing services are Compatibility; complexity; and perceived security and privacy. The measurements of the above factors were adapted from past studies in the relevant literature that will discuss in the following subsections.

5.2.2.1 Compatibility of cloud computing services

Compatibility construct was measured with six items adopted from (Gutierrez et al., 2015; Moore & Benbasat, 1991; Oliveira et al., 2014a; Ramayah et al., 2016). To operationalize compatibility, this study measured the following items: compatibility with existing technology, integration, consistency, technology fit, easy to export/import data, compatibility with the organizations' value and culture. These items of compatibility, their sources, and their corresponding code names were listed in Table 5.6.

Table 5.6 Compatibility Construct Measurement Items

Code	Compatibility	References
CMP1	Cloud computing services are compatible with firm's technological architecture, existing format, interface, and all aspects of our work.	(Gutierrez et al., 2015; Moore & Benbasat, 1991; Oliveira et al., 2014a; Ramayah et al., 2016)
CMP2	In case of any incompatibility issue, we ask cloud service provider to recommend integrated services.	
CMP3	The changes introduced by cloud computing services are consistent with existing practices in our organisation.	
CMP4	The use of cloud computing services fits the work style of our organisation.	
CMP5	There is no difficulty in exporting/importing, applications/data to cloud services.	
CMP6	Using cloud computing services are compatible with our organisation's corporate culture and value system.	

5.2.2.2 Complexity of cloud computing services

Complexity construct was measured with six items adopted from (Gutierrez et al., 2015; Moore & Benbasat, 1991; Oliveira et al., 2014a). In this study, the positive view of the degree of cloud computing services complexity was measured from the SMEs perspective by measuring the following items: manageability, easy integration, the safety of computers and data, easy to learn, and degree of skill. These items of complexity, their sources, and their corresponding code names were listed in Table 5.7.

Table 5.7 Complexity Construct Measurement Items

Code	Complexity	References
CMX1	Cloud computing services are manageable and easy to use.	(Gutierrez et al., 2015; Moore & Benbasat, 1991; Oliveira et al., 2014a; Thong et al., 2006; Weng & Tsai, 2015)
CMX2	It is easy to integrate cloud computing services with existing processes.	
CMX3	Using cloud computing services does not expose our company to the vulnerability of computer breakdowns and loss of data.	
CMX4	Learning how to operate cloud computing services doesn't require complex skills of employees of the organisation.	
CMX5	It is easy to become skillful at using cloud computing services	
CMX6	Overall, we believe that cloud computing services are easy to use.	

5.2.2.3 Perceived security and privacy of cloud computing services

Privacy and security concerns arise when SMEs decision makers feel that their organisation' data is not secure and cloud computing vendors may monitor or disclose, transmit or sell their data to others without permission. Based on that, the privacy and security constructs in this study was measured by five items as relevant for the context of cloud computing services continuous use by measuring the data security, security-related to the cloud provider, and data privacy and confidentiality. These five items of compatibility and their sources, and their corresponding code names were listed in Table 5.8.

Table 5.8 Perceived Security and Privacy Construct Measurement Items

Code	Perceived Security and Privacy	References
SCP1	Using cloud computing services will lead to secure organisation's data from loss or manipulation by unauthorized persons and hacking.	(Chan & Chong, 2013; Gupta et al., 2013; Mohammed, Ibrahim, et al., 2016)
SCP2	Cloud service provider does not use our organisation's official data for their own commercial benefits.	
SCP3	Use of cloud computing services provide better security for our organisations' data.	
SCP4	Cloud service providers and their personnel maintain the privacy and confidentiality of organizational data.	
SCP5	Overall, data security and privacy protection are better by using cloud computing services than traditional computing methods.	

5.2.3 Organizational context measurement scales

The organizational factors that contributing to the continuance use of cloud computing services are top management support, cost saving, IT readiness and perceived trust. The measurements of the above factors were adapted from past studies in the relevant literature that will discuss in the following subsections.

5.2.3.1 Top Management Support

Top management is defined in this study as the backing and commitments of the highest-ranking executives for the adoption and continuous use of cloud computing services in their SMEs. Regarding top management as a construct, the following items were measured: provide adequate resources, strong leadership and engages, risk attitude, understandability, and desirability to continuous use of cloud computing services. These items of compatibility, their sources, and their corresponding code names were listed in Table 5.9.

Table 5.9 Top Management Support Construct Measurement Items

Code	Top Management Support	References
TMS1	The organisation's management provides adequate resources to adopt and implement cloud computing services.	(Gangwar et al., 2015; Oliveira et al., 2014a)
TMS2	The organisation's top management provides strong leadership and engages in the adoption process when it comes to information systems.	
TMS3	The organisation's management is willing to take risks (financial and organizational) involved in the implementation of cloud computing services.	
TMS4	The organisation's management understands the benefits of cloud computing services.	
TMS5	The organisation's management has a desire to adopt and use new technologies to improve competitive edge.	

5.2.3.2 Cost Saving

Although cost saving is one of the factors considered at the initial stage of adopting an innovation, organisations can only confirm or rethink their initial expectations regarding its benefit after having greater experience with technology through its use. If cost saving is truly confirmed, the use of the service may be sustained in the organization. In this study, five items were adopted to measure the cost-saving construct in term of operational cost, implementation cost, purchasing cost, maintenance costs and the last item is a"global single item for overall cost in the context of cloud computing services, as shown in Table 5.10.

Table 5.10 Cost Saving Construct Measurement Items

Code	Cost Saving	References
CTS1	Cloud computing services reduce operational cost.	(Gupta et al., 2013; Saedi & Iahad, 2013a)
CTS2	The benefits of cloud computing services are greater than the costs of implementation.	
CTS3	Cloud computing services have a considerable cost saving and low purchasing over traditional computing methods in the long run.	
CTS4	Maintenance costs of cloud computing are very low.	
CTS5	Overall, cloud computing services cost is low.	

5.2.3.3 IT Readiness

Cloud computing services can become an integral part of the value chain of any SME only if it has favorable infrastructure and technical skills (Oliveira & Martins, 2010). Thus, it’s assumed that SMEs with a great IT readiness lead to continuous use of cloud computing services. This study, therefore, as shown in Table 5. 11, examined five items for the operationalization of the IT readiness construct; these five items include sufficient technological resources - unrestricted access to computers and high bandwidth, skilled employees and SMEs' Knowledge of cloud computing technology.

Table 5.11 IT Readiness Construct Measurement Items

Code	IT Readiness	References
ITR1	We have sufficient technological resources to implement cloud computing – unrestricted access to computer.	(Chan & Chong, 2013; Oliveira & Martins, 2010)
ITR2	We have sufficient technological resources to implement cloud computing – high bandwidth connectivity to the Internet.	
ITR3	Within the organisation, there are employees who have sufficient skills to implement cloud computing services.	
ITR4	Most of our employees are computer literate.	
ITR5	The organisation knows how cloud computing can be used to support operations.	

5.2.3.4 Perceived Trust

Perceived trust is defined in this study as the SMEs’ perception of cloud computing services as a useful and trusted service provider that will not exploit them. In this study, trust was measured by five items which were adapted from (Akter et al., 2013; Shareef et al., 2011) to measure the expected functionality, trustworthy, protect of rights, privacy, and integrity as shown in Table 5.12.

Table 5.12 Perceived Trust Construct Measurement Items

Code	Trust	References
TRS1	Cloud computing services are functioning as we expect.	(Akter et al., 2013; Shareef et al., 2011)
TRS2	Suppliers of cloud computing services are trustworthy.	
TRS3	Suppliers of cloud computing services will do everything in their capacity to protect the subscribers’ rights.	
TRS4	Suppliers of cloud computing services will do everything to guarantee the privacy and integrity of data made available through cloud computing.	
TRS5	Overall, cloud computing services are trustworthy.	

5.2.4 Environmental context measurement scales

Two environmental factors that contribute to the continuance use of cloud computing services namely competitive pressure and government support. The measurements of these two factors were adapted from past studies in the relevant literature that will discuss in the following subsections.

5.2.4.1 Competitive Pressure

The competitive pressure construct in this study refers to the perceived pressure by SMEs decision makers that competitors have gained a substantial competitive advantage by using cloud computing services. Six items were used to measure the competitive pressure construct adopted from (Oliveira et al., 2014a),to measure market share, outperform the competition, competitive advantages and overall global item as shown in Table 5.13.

Table 5.13 Competitive Pressure Construct Measurement Items

Code	**Competitive Pressure**	**References**
CPP1	Cloud computing services enable our organisation to achieve better market share than our competitors without cloud computing services.	(Oliveira et al., 2014a)
CPP2	Cloud computing services increase the ability to outperform the competition.	
CPP3	We understand the competitive advantages offered by cloud computing services.	
CPP4	It is impressive to have cloud computing services when other SMEs do not have.	
CPP5	Our organisation is at a disadvantage if it does not adopt cloud computing services.	
CPP6	Our organisation is under pressure from competitors to adopt cloud computing services.	

5.2.4.2 Government Support

Government support refers to the support from governments to encourage the use of cloud computing services by SMEs. Table 5.14 shows the five items adapted from (Mohtaramzadeh et al., 2018; Saedi & Iahad, 2013a) to measure the incentives procurement policies, high tech provision, regulations and laws, and overall government support.

Table 5.14 Government Support Construct Measurement Items

Code	Government Support	Source
GOV1	Government provides incentives to adopt cloud computing services.	(Mohtaramzadeh et al., 2018; Saedi & Iahad, 2013a)
GIV2	Government procurement policies mandated the use of cloud services.	
GOV3	The provision of affordable high-quality broadband availability by the government is important to adopt and implement cloud computing services.	
GOV4	There is adequate legal protection for customer or supplier transactions using cloud computing services.	
GOV5	Overall, adequate government support is provided when we adopted cloud computing services.	

5.2.5 Organization performance measurement scales

Researchers have conceptualized and measured performance in different ways. As such, several different opinions, approaches, and definitions of performance have been postulated. This study will consider organizational performance as a dependent variable in examining cloud computing impact on SMEs. Furthermore, this study also measures performance at organisation level by considering the financial and non-financial performance, where the performance measurement items are adopted from previous studies (Akter et al., 2016; Lo et al., 2016a; Wamba et al., 2017). In this research study, performance will be used as a dependent variable. In the literature of performance, there are many performance measurements (Perez-Mendez & Machado-Cabezas, 2015). As shown in Table 5.15, this study adopted 10 different items to measure financial and non-financial performance at an organisation level adopted from (Akter et al., 2016; Lo et al., 2016a; Wamba et al., 2017) to measure the profitability, cuts down the operational costs, market share, productivity, clients satisfaction, competitive edge, retrieve accurate data and overall organizational performance of organisation relative to competitors which were then combined into one construct.

Table 5.15 Organizational Performance measurement items

Code	Organizational Performance	Source
OGP1	Our sales growth rate is higher than it was before the adoption of cloud computing services.	(Akter et al., 2016; Lo et al., 2016a; Wamba et al., 2017)
OGP 2	The adoption of cloud computing services increases the profitability and cuts down the operational costs in our organisation in comparison to the time before adopting cloud computing services.	
OGP 3	Market share of our company is higher than it was before the adoption of cloud computing services.	
OGP 4	Cloud computing services increased financial performance.	
OGP 5	Cloud computing services increased productivity.	
OGP 6	The satisfaction of our clients is higher after adoption of cloud computing services.	
OGP 7	The competitive edge of our organisation is higher after adoption of cloud computing services.	
OGP 8	Our organisation ensures that customers´ product and/or Service preferences are satisfied after adoption of cloud computing services.	
OGP 9	Cloud computing services provide us with more accurate data.	
OGP 10	Overall, it is easier to monitor organizational performance with cloud computing services over traditional computing methods.	

5.3 Stage 2: Measurement Reviewing Process

In the second stage, content validity is achieved by reviewing the instrument items, where content validity measures the capability of the items to perfectly assess their associated construct. Accordingly, academicians such as (Moore & Benbasat, 1991; Polit & Beck, 2006) established that the assessment of content validity is an important step to be employed when developing an instrument. Hence, in this research content validity was attained by ensuring that all items were derived from existing literature related to this study and also a five experts (drawn from the academics and industry) were invited to review the instrument items for correctness and relevance. The five experts were selected due to their skills and knowledge in information systems related research. We opted for only five experts based on the recommendation postulated by (Aziz & Kamaludin, 2016; De Vaus, 2013) for a minimum of 3 experts and a maximum of 10 experts for research instrument evaluation. Then, after the expert review to confirm content validity was achieved based on the comments of the panel of five experts pilot was carried out as previously stated and lastly, the main survey was carried out.

Furthermore, in order to measure the level of agreement among the selected experts, Kappa measure was employed to evaluate the content validity of the developed measurement instrument (Landis & Koch, 1977) as adopted by Fleiss (1971) who utilized kappa measure to rate the response level for data collected between three or more raters based on a categorical item measure. Therefore, Kappa measure was used to analyze the reviews from the expert panel and practitioners in assessing the evaluated construct validity inter-rater reliability. Additionally, the Kappa measure is based on a statistical coefficient of inter-rater reliability whose value ranges from 0 to 1, where the higher the value the more reliable is the response. (Landis & Koch, 1977). In this study, results for the overall inter-rater reliability was given as with K= 0.750 for relevancy and K=0.83 for simplicity suggesting an acceptable content validity.

Based on the response from the expert review, items in the measurement instrument was refined and a final version of the instrument was corrected as a few sentence were corrected to be more simple and easy to understand in provide meaning to prospective respondents. Next, in relation to the collective comments from the experts it was evident that one of the instrument item CMX3 for construct "complexity" termed "Using cloud computing services does not expose our company to the vulnerability of computer breakdowns and loss of data" was not relevant to the complexity construct since its meaning is more aligned to perceived security and privacy construct. But, the aim of complexity construct is to observe the perceived degree of difficulty of using and understanding cloud computing services from SMEs' perspective. Thus, this item was excluded based on the suggestions of the experts. Likewise, another insightful comment from the experts was to change the complexity items from negative to positive questions and also use items from Ease-of-Use construct from Technology Acceptance Model

(TAM) (Davis, 1989) so that all items in the developed measurement instrument will be perceived as positive from the respondents perspective.

5.4 Stage 3: Measurement Testing (Pilot Study)

The third phase is the measurement testing which aims to achieve a more objective assessment of the developed measurement instrument by testing the developed instrument via pilot study based on a small number of participants before collecting the main data from a larger population. This is an important step as it aids to assess the validity and reliability of the developed instrument, and also helps to check if the developed instrument possesses any weakness. Hence, pilot testing is an important aspect of any research that should be carried out before the main data collection. During the pilot survey session, the researcher aim is to assess the impact of the instrument constructs and their associated items. Moreover, pilot study helps the researcher to predict the sample size required to proceed with the main study and also offers opportunities to enhance the study methodology before proceeding to the main research study (Urbach & Ahlemann, 2010). Although, in regards to sample size for pilot study several sample size has been recommended in the literature, among the studies Isaac and Michael (1995); Hill (1998) recommended a sample size of about 10-30 respondents, while other academicians such as De Vaus (2013) suggested for 5-100 samples required to the validate any research instrument mentioning that more samples will result to more reliable result.

In this research the pilot survey was carried out in 86 different SMEs situated in Kuantan Malaysia, where the respondents were communicated via face to face and the hardcopy of the questionnaire was handed to the participants after the need and aim of the research was explained to the prospective respondents. Then, the participants were asked of prior experiences in deploying cloud computing services in their enterprise, and only respondents that have previously implemented cloud service were invited to fill the questionnaire to guarantee that valid data is collected. During data collection, the researcher was present to answer any questions that may arise as the respondents fill the questionnaire. Thus, questions that needed clarification were addressed to prevent content misunderstanding.

This study employed the measurement model assessment criteria by using structural equation modeling statistical technique to minimize the measurement error and further validate the survey instrument in the pilot study phase as suggested by (Straub, Boudreau, & Gefen, 2004). Hence, as previously stated PLS-SEM based on SmartPLS 3.0 was deployed to validate the reflective measurement model (Moore & Benbasat, 1991; Straub et al., 2004). The results of the measurement model assessment, including establishing reliability and validity, are discussed in the next sub-sections.

5.5 Results of Pilot Study

In order to revise and finalize the questionnaire instrument pilot study will be conducted to ensure the validity and reliability of the developed questionnaire. Results of the pilot study including the criteria and their acceptable values for the measurement model assessment are discussed in the following subsections..

5.5.1 Establish Reliability

There is need to ensure that the developed measurement instrument is reliable and valid, where reliability refers to the consistency of the item measure used within the study (Kimberlin & Winterstein, 2008; Sekaran & Bougie, 2016). Reliability assessment of the instrument involves checking the internal consistency reliability of the constructs and associated items as suggested by (Hair Jr et al., 2016; Ramayah et al., 2018).

5.5.1.1 Item Reliability

Item reliability is employed in research to test the degree to which a construct or a collection of constructs is dependable with what it anticipates to measure (Urbach & Ahlemann, 2010). The reliability of the instrument items is measured based on the factor loadings of the construct items, where the factor loadings indicate the degree to which the instrument items can assess the associated construct. Besides, it is recommended for the factor loadings values to be higher than 0.708 to be accepted Henseler et al., 2009). Hence, items with loadings higher than 0.7 distribute a large portion of variance with their corresponding variable. Accordingly, results from Table 5.16 depict that all items loading exceeded the threshold value, thereby, internal reliability is established, and all items used to measure the constructs are reliable.

Table 5.16 Pilot Study Reliability Results

Constructs	Items	Item Reliability Factor Loading	Construct Reliability Cronbach's Alpha	Composite Reliability
	CMP1	0.821		
	CMP2	0.856		
CMP	CMP3	0.780	0.885	0.913
	CMP4	0.841		
	CMP5	0.725		
	CMP6	0.757		
	CMX1	0.830		
	CMX2	0.813		
CMX	CMX3	0.875	0.883	0.915
	CMX4	0.753		
	CMX5	0.855		
	CNF1	0.890		
CNF	CNF2	0.837	0.894	0.926
	CNF3	0.895		
	CNF4	0.859		
	CPP1	0.846		
	CPP2	0.805		
CPP	CPP3	0.804	0.899	0.923
	CPP4	0.791		
	CPP5	0.832		
	CPP6	0.815		
	CTS1	0.854		
	CTS2	0.787		
CTS	CTS3	0.879	0.875	0.909
	CTS4	0.762		
	CTS5	0.798		
	CUCC1	0.825		
	CUCC2	0.871		
CUCC	CUCC3	0.857	0.920	0.937
	CUCC4	0.866		
	CUCC5	0.853		
	CUCC6	0.794		
	GVS1	0.833		
	GVS2	0.845		
GVS	GVS3	0.848	0.899	0.925
	GVS4	0.841		
	GVS5	0.851		
	ITR1	0.787		
	ITR2	0.793		
ITR	ITR3	0.841	0.860	0.900
	ITR4	0.753		
	ITR5	0.829		

Table 5.16 Continued

Constructs	Items	Item Reliability	Construct Reliability	
		Factor Loading	Cronbach's Alpha	Composite Reliability
SCP	SCP1	0.731	0.843	0.888
	SCP2	0.812		
	SCP3	0.772		
	SCP4	0.818		
	SCP5	0.781		
STS	STS1	0.887		
	STS2	0.830		
	STS3	0.837		
	STS4	0.814		
TMS	TMS1	0.871	0.863	0.907
	TMS2	0.829		
	TMS3	0.857		
	TMS4	0.794		
	TMS5	0.866		
TRS	TRS1	0.786	0.841	0.887
	TRS2	0.792		
	TRS3	0.758		
	TRS4	0.778		
	TRS5	0.794		
RLA	RLA1	0.833	0.889	0.919
	RLA2	0.817		
	RLA3	0.866		
	RLA4	0.824		
	RLA5	0.823		
OGP	OGP1	0.761	0.934	0.944
	OGP 2	0.801		
	OGP 3	0.788		
	OGP 4	0.719		
	OGP 5	0.839		
	OGP 6	0.853		
	OGP 7	0.823		
	OGP 8	0.792		
	OGP 9	0.721		
	OGP 10	0.811		

CMP = Compatibility , CMX= Complexity; CNF= Confirmation, CPP= Competitive pressure, CTS = Cost saving, GVS = Government support, ITR =IT readiness, OGP = Organizational Performance, RLA = Relative advantage, SCP= Security and privacy, STS= Satisfaction, CUCC = Continuance use of cloud computing, TMS= Top management support, TRS= Perceived Trust

5.5.1.2 Construct Reliability

The constructs' internal consistency reliability was assessed by considering the Composite Reliability (CR) and Cronbach's alpha (CA) score to ensure the developed measurement instrument is valid (Hair Jr et al., 2016; Straub et al., 2004). Prior studies, routinely applied CA to measure the internal consistency of variables and factors, however CA assumes that the outer loadings of all items in a construct are equal, so it is sensitive to the number of items in the construct. But, researchers such as (Hair Jr et al., 2016) proposed to employ PLS-SEM in measuring the internal consistency reliability by considering both CA and CR. Thus, CA and CR are the commonly applied criteria for the evaluation of reflective measurement constructs when using PLS-SEM (Hair Jr et al., 2016). To assess CA the values should be equal to and greater than 0.60 to be acceptable and values of 0.70 and above are satisfactory. For the CR the values should be between 0.60 to 0.70 in descriptive research and scores from 0.70 to 0.90 in empirical research are considered as satisfactory, conversely scores below 0.60 suggest the item is not reliability (Hair et al., 2011).

In the present research, the reliability measures CA and CR were examined using PLS algorithm in Smart PLS. Results from Table 5.16 show that all the CA and CR values met the recommended score. The CA and CR scores from the pilot study, as depicted in Table 5.16, ranged from 0.841 to 0.920 and 0.887 to 0.937, respectively. The results suggest that the instrument item reliability was confirmed, thus the questionnaire can be deployed offline and online to collect data for the main survey

5.5.2 Establish Validity

Validity assess the degree to of how extensive an instrument items measures what they supposed to assess (Sekaran & Bougie, 2016). Hence, for an instrument to be valid, the instrument must be reliable, although an instrument can be reliable without being valid (Kimberlin & Winterstein, 2008). Thus in this study, the validity of the developed instruments was evaluated based on the convergent and discriminant validity assessment as recommended by (Hair Jr et al., 2016; Ramayah et al., 2018).

5.5.2.1 Convergent Validity

Convergent validity refers to the degree to which an item correlates significantly with other items both measuring the same variable (Hair Jr et al., 2016). In other words, convergent validity entails the representation of a group of items of the same principal variable which can be assessed based on their uni-dimensionality (Henseler et al., 2009). Convergent validity relies upon the correlations among responses that are achieved using different methods in measuring the same construct (Götz, Liehr-Gobbers, & Krafft, 2010). A common method of measuring convergent validity is the Average Variance Extracted (AVE) criterion (Fornell & Larcker, 1981). For a measurement model to have adequate convergent validity, the constructs should have an AVE value of 0.5 or above (Fornell & Larcker, 1981; Hair Jr et al., 2016). This implies that the items share at least half of their variance with the construct (Henseler et al., 2009). For this current study, Table 5.17 depicts the AVE values for the constructs in the developed instrument based on PLS algorithm test. The results reveal that the AVE score is greater than 0.50 in all cases, suggesting a good convergent validity is achieved.

Table 5.17 Average Variance Extracted

Constructs	**Average Variance Extracted (AVE)**
Compatibility	0.637
Complexity	0.682
Confirmation	0.757
Competitive Pressure	0.665
Cost Saving	0.668
Continuous Use of Cloud Computing Services	0.714
Government Support	0.712
IT readiness	0.642
Perceived Security And Privacy	0.614
Satisfaction	0.710
Top Management Support	0.712
Perceived Trust	0.611
Relative Advantage	0.693
Organization Performance	0.627

5.5.2.2 Discriminant Validity

Discriminant validity verifies the uniqueness of each construct (Fornell & Larcker, 1981; Henseler et al., 2015). It assesses the extent to which constructs in a model differed from each other. Therefore, all constructs ought to correlate more with their own measures than with those of the other constructs. Based on the suggestion of (Hair Jr et al., 2016), the discriminant validity of each items is measured by assessing the cross-loadings (Chin, 1998b). Similarly, discriminant validity of the constructs can also be measured by assessing the Fornell-Larker criterion (Fornell & Larcker, 1981).

Academicians such as Chin (1998b) suggested that researchers should examine the cross-loading of factor loading to ensure that each item within a variable is greater than all of its cross-loadings in column and row. This means that if each item's loading score is greater for its measured variable as compared to any other variables, then, it can be concluded that the different variables' items are not similar. Results from Table 5.18 depict that each measuring item for each variable was greater than all of its cross-loadings in column and row, thus the measurement model is confirmed to have strong discriminant validity at the items level.

In regards to the constructs, the Fornell-Larcker benchmark is mostly employed to measure discriminant validity in PLS-SEM statistical analysis (Hair Jr et al., 2016; Ramayah et al., 2018). According to (Fornell & Larcker, 1981b), it is carried out by checking the AVE square root of construct which should be higher than the correlations among the other variables in the structural model in order to achieve a satisfactory discriminant validity. Thus, results from Appendix E show that the square root of AVE for each variable is higher than the elements of the diagonal values. Thus, the result confirms that measurement model has no issues regarding the discriminant validity measurement.

Table 5.18 Fornell-Larcker Criterion

	CMP	CMX	CNF	CPP	CTS	CUCC	GVS	ITR	OGP	RLA	SCP	STS	TMS	TRS
CMP	0.798													
CMX	0.702	0.826												
CNF	0.039	0.134	0.87											
CPP	0.718	0.634	0.187	0.816										
CTS	0.764	0.774	0.161	0.777	0.877									
CUCC	0.728	0.748	0.16	0.73	0.816	0.845								
GVS	0.703	0.683	0.079	0.727	0.784	0.821	0.844							
ITR	0.752	0.723	0.165	0.789	0.718	0.773	0.754	0.801						
OGP	0.751	0.626	0.105	0.612	0.725	0.684	0.665	0.725	0.792					
RLA	0.696	0.703	0.275	0.702	0.767	0.83	0.726	0.754	0.649	0.833				
SCP	0.727	0.753	0.414	0.763	0.789	0.761	0.662	0.748	0.679	0.799	0.783			
STS	0.597	0.65	0.443	0.711	0.67	0.779	0.648	0.648	0.534	0.765	0.765	0.843		
TMS	0.673	0.67	0.055	0.689	0.738	0.758	0.77	0.725	0.676	0.668	0.620	0.54	0.844	
TRS	0.603	0.609	0.174	0.69	0.647	0.703	0.626	0.665	0.596	0.715	0.656	0.594	0.593	0.782

CMP = Compatibility , CMX= Complexity; CNF= Confirmation, CPP= Competitive pressure, CTS = Cost saving, GVS = Government support, ITR =IT readiness, OGP = Organizational Performance, RLA = Relative advantage, SCP= Security and privacy, STS= Satisfaction, CUCC = Continuance use of cloud computing, TMS= Top management support, TRS= Perceived Trust

5.6 Chapter Summary

This chapter was centred around a systematic three-step process was employed to develop and validate a reliable and valid instrument for predicting the continues of cloud computing services usage in Malaysian SMEs.

The three steps included: define theoretical constructs and items creation, instrument reviewing process, measurement reviewing process, and measurement testing. In the definition of constructs and items creation stage, we deeply reviewed the relevant literature and developed the conceptual definition of the fourteen construct and generated the list of the items for each construct. Secondly, the measurement reviewing process of the developed model was established through content validity by a comprehensive literature review process and five experts from academia. There were 76 reflective items representing the fourteen contextualized constructs. Finally, the pilot study was conducted, and the data collected from 86 SMEs, and performed a statistical analysis using partial least squares structural equation modeling (PLS-SEM) approach to test the developed model and establish the reliability and validity of the scale. The main reason for conducting the measurement testing stage (pilot study) was to acquire an overview of data applicability in this research and assist the researchers in achieving appropriate and relevant responses in the main study.

CHAPTER 6

RESULTS AND DISCUSSION

6.1 Introduction

This study aims to investigate factors that influence the perception of decision-makers in Malaysia SMEs in regard to the continuance use of cloud computing services as a tool to enhance the organization's performance. Accordingly, this chapter presents the results from the survey data, as previously discussed in Chapter 5 towards validating the integrated research model that was proposed in Chapter 4. As well as model verification and evaluate its applicability in SMEs. Thus, this chapter proceeds by carrying out data preparation which includes data coding, treating missing values, removing outliers, normality checking, and also checking for bias based on the common method bias in SPSS version 25. Besides, descriptive statistics was employed in SPSS to presents findings of the demographic profile of the respondents and their respective SMEs. Likewise, descriptive statistics was also employed on the research model variables. Furthermore, PLS-SEM using SmartPLS software version 3 was utilized to validate the research model hypotheses by deploying two statistical tests which includes assessing the relationships between latent constructs and their indicators (the measurement model) and assessing the relationships between the endogenous latent variables and exogenous latent variables (the structural model). Model verfication through two real case studies was carried out to verify and evaluate the applicability of the integrated model in SMEs.

Finally, the summary of the chapter is presented.

6.2 Data Preparation

In any statistical analysis, it is required to prepare the data as this helps to confirm the completeness and consistency of the data. Thus, in this study the survey data was prepared by screening the data, replacing missing values, removing outliers and checking of data normality before proceeding to further analysis. Therefore, this section discusses how the data was treated by the author.

6.2.1 Data Coding and Cleaning

The first step of data preparation begins with data coding, data entry, and data cleaning. This is carried out by the author who developed a codebook to minimize variation during data entry/coding. The code book comprises of numerical values which are assigned to the demographic variables (11 questions). Besides, the code book comprises of the model variables which includes 76 items which are coded based on a five-point Likert scale (Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree) from the lowest value 1 for 'strongly disagree 'to the highest value 5 for 'strongly agree' (see Appendix A for questionnaire coding procedure).

Data was collected from paper-based survey and online survey. Then the data from the online survey was saved automatically in an Excel spread sheet, whereas the data from the paper-based survey was manually entered into Excel spread sheet. Next, the complied data was imported into SPSS for instant checks and data analysis. The author proceeded to deploy frequency test on the data to ensure that there is no missing values or wrong input in the data, where results from the frequency test suggest that the minimum or maximum value do not exceed the required range. Hence, the frequency test confirms that the survey data is clean and no error was detected in the entry and coding of the data into SPSS.

6.2.2 Treating Missing Data

As stated earlier in Chapter 3, the survey questionnaire was distributed via an online-based and paper-based. For the online survey session, link to the survey questions was emailed to 1,479 SMEs in Malaysia. However, only 60 participants completed the online version with respond rate of 4.9%. But, since all questions were marked as mandatory at the end of the data collection period no incomplete questionnaires were observed in the online survey. In contrast, for the paper-based survey, a total of 376 numbers of participants returned their filled questionnaires. However, there were 21 cases who returned the survey with most items unanswered (missing data more than 5%), these were removed from data analysis. Thus, the total number of respondents for both online and paper-based survey was given as 436.

Thus, after excluding the incomplete responses (0 cases from the online version and 21 cases from the paper-based version), the data was reduced to a total of 415 usable responses from online-based and paper-based survey. In this study, the missing values were replaced with mean score as this was considered acceptable since it would not lead to misinterpretation (Tabachnick & Fidell, 2001), where the missing data rate was less than 5%.

6.2.3 Removing Outliers

In this section, the author proceeds to check the data for two types of outliers, univariate and multivariate. Therefore, SPSS was used to identify the univariate outliers for all the 76 cases by determining frequency distributions of z-score. As shown in Appendix F, the results indicate that the standardized (z) scores of the cases for the research variables ranged from -2.928 to +1.912 and none of the items exceeded the threshold of ±3.29. Thus, no extreme scores were recorded suggesting there is no any univariate outlier among the initial 76 cases.

Likewise, Mahalanobis distance D^2 was also employed to detect the multivariate outlier analysis by identifying the high values between the variables in the research model. A regression analysis using SPSS was performed to measure each variable and then is compared with a critical $\chi 2$ value with the degrees of freedom equal to the number of independent variables within the probability of $p<0.001$. The results of Mahalanobis distance D^2 (refer to Appendix G) reveal that 38 cases were multivariate outliers. These 38 cases were removed from the final data set used in subsequent analyses. The adjusted sample size was 377 respondents which satisfies the sample size requirement and maintain an appropriate power of analysis.

6.2.4 Data Normality

Test of normality is one of data confirmation required to be carried out to specify if the data set is suitable for parametric test or non-parametric test, where normality refers to the "degree to which the distribution of the sample data corresponds to a normal distribution". However, since this study employs PLS-SEM to validate the research model, according to (Hair Jr et al., 2016), it is assumed that the data has a nonspecific distribution for indicators and no independence of observations. However, test of multivariate Skewness and Kurtosis have been conducted as a procedure of pre-processing to determine if data is normal distributed. Therefore, this study employed a web application software developed by Cain et al. (2017) to assess the multivariate Skewness and Kurtosis (see Appendix H). The results reveal that the data collected distribution does not present multivariate normality, Mardia's multivariate Skewness ($\beta = 25.138$, $p < 0.001$) and Mardia's multivariate Kurtosis ($\beta = 277.892$, $p < 0.001$), thus SmartPLS which is a non-parametric analysis software was then used as a suitable statistical tool by employing bootstrapping test to avoid any type of non-normal distribution.

6.2.5 Common Method Bias

Common Method Bias (CMB) is a situation that occurs in analyzing survey based data when the measurement method used by the researcher influences the data collected. Academicians such as (Podsakoff et al., 2003) consider this an issue as it results in erroneous conclusions stemming from the error in measurement. Thus, this study performed two statistical tests to check for the potential existence of CMB in the collected data. Firstly, Harman's single factor test was employed to check for CMB which revealed that the first factor accounted for 37.736 % of variance which is less than the threshold level of 50% (refer to Appendix I) of total variance which indicates the CMB does not affect the results as suggested by (Podsakoff et al., 2003). Although, Harman's single factor is the most widely used test in the literature to check whether CMB exist in a data. However, the Harman's single factor approach is faced with a few limitations as mentioned by (Kemery & Dunlap, 1986; Kock, 2015). Respectively, as suggested by (Kock, 2015) this study further deployed multi-collinearity assessment test using PLS-SEM to check the occurrence of a Variance Inflation Factor (VIF). Results from collinearity assessment test indicate that the occurrence of the VIF value is greater than 3.3 which show an indication of pathological collinearity, and also indicate that the model variables may be affected by common method bias as shown in Table 6.1.

Table 6.1 Common Method Bias Test

Independent Variables	Dependent Variable			
	CUCC	OGP	RLA	STS
CMP	2.428			
CMX	1.602			
CNF			1	1.307
CPP	2.806			
CTS	2.922			
CUCC		1		
GVS	2.612			
ITR	2.595			
OGP				
RLA	2.219			1.307
SCP	2.992			
STS	2.879			
TMS	2.711			
TRS	1.949			

CMP = Compatibility , CMX= Complexity; CNF= Confirmation, CPP= Competitive pressure, CTS = Cost saving, GVS = Government support, ITR =IT readiness, OGP = Organizational Performance, RLA = Relative advantage, SCP= Security and privacy, STS= Satisfaction, CUCC = Continuance use of cloud computing, TMS= Top management support, TRS= Perceived Trust

Thus, results from PLS algorithm depict that the VIF for all the constructs as (see Table 6.1) are less than the 3.3 threshold recommended by (Kock, 2015) to test for common method bias. Thus, the results indicate that there is absent of common method bias in instrument utilized in this study.

6.3 Descriptive Analysis

Descriptive analysis generally refers to the characteristics or profile of respondents. Descriptive statistics is deployed to clearly define the main features of the data for further statistical analysis. Thus, descriptive analysis is carried out using SPSS to present frequencies, means, and standard deviations results of the target sample which is Malaysia SMEs that uses cloud computing services in their daily business operations.

6.3.1 Descriptive Analysis of Respondent

As mentioned earlier in Chapter 4, the sample frame for this study is restricted to all Malaysia SMEs that used cloud computing services. Accordingly, the first section of the survey questionnaire (refer to Appendix A & B) comprises of eleven demographic questions (five for respondent's profile and six for SMEs profile). Thus, frequency and percentage distribution of the survey respondents as well as their respective enterprise characteristics are presented in Table 6.2 which depicts the characteristics of the 377 usable responses including gender, age, level of education, profession, and year of experience.

Results from Table 6.2 indicate that 205 (54.4%) of the respondents who participated in the survey was females whereas the remaining 172 (45.6%) are males respondents. With respect to the age distribution 159 (4.2 %) of the participants in this study are aged between 34 and 40 years old. This may be attributed to the position of each respondent which are from the decision makers in their SMEs. Whereas, 64 (17%) of the respondents were between the age of 18 -25 years (young). and only 6 (1.6 %) of the respondents are within the age of 51 years and older. Results from Table 6.2 regarding educational level reveal that 141 (37.4%) of the respondents have Bachelor degree qualification, followed by Diploma with 137 (36.3%), High School with 54 (14.3%), and lastly postgraduate Degree 45 (11.9%).

Table 6.2 Respondents' Characteristics

Group	Frequency	Percentage
Gender		
Male	172	45.6
Female	205	54.4
Age		
18 -25 years	64	17.0
26 - 33 years	159	42.2
34 – 40 years	104	27.6
41 – 50 years	44	11.7
51 years and older	6	1.6
Education Level		
High School and less	54	14.3
Diploma & College	137	36.3
Bachelor degree	141	37.4
Master Degree	36	9.5
PhD	9	2.4
Profession		
Owner	132	35.0
CEO	75	19.9
IT Manager	136	36.1
Other	34	9.0
Year of Experience		
Less than 5 years	124	32.9
5-10 years	113	30.0
11-15 years	99	26.3
Over 15 years	41	10.9
Total	377	100

Furthermore, results from Table 6.2 suggest that a total of 36.1% of the respondents are IT Managers, followed by 35% who are business owners, 19.9% are CEOs, and lastly 9% do not provide their current roles. However, all respondents are responsible for making decisions regarding the adoption and use of cloud services in their organisations.

In addition, results from Table 6.2 concerning the years of experience, indicate that 124 (32.9%) of the respondents have been working in SMEs for about 1 to 5 years. Next, 113 (30%) of the respondents have working experience of about 5-10 years. Followed by, 99 (26.3%) of the respondents who possess experience of about 11 to 15 years and, lastly, 41 (10.9%) of the respondents have over 15 years of experience working in SMEs.

Table 6.3 SMEs' Characteristics

Group	**Frequency**	**Percentage**
Number of Employees		
Less than 5	92	24.4
5 to 29	166	44
30 to 75	77	20.4
76 to 200	29	7.7
More than 200	13	3.4
Revenue (Annual Sales Turnover)		
Less than RM300,000	64	17
RM300,000 - RM3 million	56	14.9
RM3 million - RM20 million	18	4.8
More than RM20 million	32	8.5
Confidential	87	23.1
Do not know	120	31.8
Sector		
Services	110	29.2
Manufacturing	35	9.3
Technology	91	24.1
Financial service	23	6.1
Healthcare	25	6.6
Retail	41	10.9
Education	21	5.6
Other	31	8.2

Table 6.3 Continued

Group	Frequency	Percentage
Organisation Established		
less than 1 year	55	14.6
1 – 4 years	97	25.7
5 – 10 years	123	32.6
more than 10 years	102	27.1
CC-Used		
less than 6 months	46	12.2
6 months – 1 year	150	39.8
2 – 5 years	136	36.1
more than 5 years	45	11.9
CC-Payments		
Pay-as-you-go	319	84.6
License	29	7.7
Unlimited access with monthly fee	2	0.5
Do not know	27	7.2

Table 6.3 present the respondents enterprise characteristics, where the results regarding the organisations' size (which measures the number of employees and annual sales turnover) suggest that 44 % of SMEs have up to 5-29 employees, followed by 24.4% of the sample who claimed that they had less than 5 employees in their enterprise, while another 20.4 % selected that their enterprise comprises of between 30 to 75 employees. However, 13% agreed that they have more than 200 employees and another 7.7% of the respondents selected that their enterprise comprises of about between 76 and 200 employees.

Considering the annual sales turnover, 37.8% of the respondents claimed they do not know their organisations' annual sales turnover, whereas 21% of the respondent refused to disclose their organisations' financial information based on issues related to confidentiality. In addition, 14.9 % of the respondents selected that their organisation have an annual revenue that is between RM300, 000 - RM3 million, and another 8.5% make more than RM20 million as an annual sales turnover.

Furthermore, results from Table 6.3 indicate that the respondents' organisations belong to different industrial sectors which range from services, manufacturing, technology, financial service, healthcare, retail, education, and others. Besides, 29.2 % of the respondents' organisations' belongs to services sector, whereas 24.1 % are from technology based organisations. Concerning the established of enterprise in regards to years, 32.6% of the organisations were established about 5 to 10 years ago and another 27% were established more than 10 years ago.

Additionally, results from Table 6.3 show the period of cloud computing services used, where a total of 39.8% of the respondents' organisations have been using cloud computing services between the period of 6 months to a year, while 36.1% have been using the cloud computing services from 2 to 5 years and 84.6% of the respondents' organisations used pay-as-you-go for their cloud computing services subscriptions.

6.3.2 Descriptive Statistics of Instrument

This sub-section presents the descriptive analysis of the responses to the second set of questions presented in the survey instrument (refer to Appendix A & B). Thus, descriptive analysis was carried out to provide a description in how SMEs viewed the factors presumed to influence the continuance use of cloud computing services. Therefore, the author assesses the mean and standard deviations value for each variable items by measuring 14 constructs based on 76 items measured based on a five-point Likert scale, ranging from 1 - strongly disagree to 5- strongly agree (refer to instrument development Section 4.6). Therefore, Table 6.4 depicts the descriptive analysis of each variable items.

Results from Table 6.4 shows that the all constructs have a mean value which range from 3.4499 for government support factor (GVS) to 3.6967 for continuance use of cloud computing services (CUCC). Likewise, among the constructs, continuance use of cloud computing services had the highest mean value of 3.6967 followed by satisfaction (STS) with a mean value of 3.6718. The results also show that the minimum mean among all 76 items is GVS1 I government support constructs which has a mean value of 3.35 and Standard Deviation (SD) of 0.841 and the maximum means refer to CUCC6 of continues use of cloud computing construct with a mean value of 3.94 and SD of 0.766. In summary results from the descriptive analysis suggest that the survey data items were accepted by the respondents to be positively important.

Next, the author proceeded to reverse-coded the responses for each factor, because each construct items have a complexity factor in the questionnaire which includes positive statements and the hypothesis is a negative relation. For instance, the highest value of the five-point Likert scale in a negative statement is 5 (strongly agree). However, in a positive statement, the value will be 1 (strongly disagree).

Table 6.4 Descriptive Statistic of Instrument Constructs and their Related Items

Constructs	Items	Mean	SD	Overall Mean	Constructs	Items	Mean	SD	Overall Mean
Relative Advantage	RLA1	3.60	0.786	3.6276	Competitive pressure	CPP1	3.54	0.818	3.5407
	RLA2	3.60	0.851			CPP2	3.44	0.827	
	RLA3	3.58	0.844			CPP3	3.53	0.825	
	RLA4	3.60	0.838			CPP4	3.53	0.825	
	RLA5	3.76	0.808			CPP5	3.54	0.887	
Complexity	CMX1	3.60	0.799	3.5809		CPP6	3.67	0.785	
	CMX2	3.53	0.819		Government Support	GVS1	3.35	0.841	3.4499
	CMX3	3.55	0.862			GVS2	3.41	0.868	
	CMX4	3.59	0.834			GVS3	3.47	0.881	
	CMX5	3.63	0.832			GVS4	3.47	0.887	
Compatibility	CMP1	3.53	0.835	3.5066		GVS5	3.54	0.834	
	CMP2	3.44	0.883		Continues use of cloud computing	CUCC1	3.66	0.894	3.6967
	CMP3	3.45	0.831			CUCC2	3.63	0.945	
	CMP4	3.43	0.848			CUCC3	3.66	0.938	
	CMP5	3.70	0.823			CUCC4	3.61	0.981	
	CMP6	3.49	0.872			CUCC5	3.68	0.931	
Security and Privacy	SCP1	3.55	0.721	3.4971	Confirmation	CUCC6	3.94	0.766	
	SCP2	3.45	0.781			CNF1	3.70	0.877	3.6034
	SCP3	3.45	0.817			CNF2	3.56	0.842	
	SCP4	3.47	0.795			CNF3	3.56	0.892	
	SCP5	3.57	0.829			CNF4	3.59	0.892	
Top Management Support	TMS1	3.50	0.779	3.557	Satisfaction	STS1	3.64	0.763	3.6718
	TMS2	3.51	0.822			STS2	3.62	0.787	
	TMS3	3.56	0.827			STS3	3.62	0.820	
	TMS4	3.54	0.808			STS4	3.81	0.823	
	TMS5	3.68	0.835		Organization performance	FOP1	3.51	0.973	3.5034

Table 6.4 Continued

Constructs	Items	Mean	SD	Overall Mean	Constructs	Items	Mean	SD	Overall Mean
Cost Saving	CTS1	3.56	0.79	3.5804		FOP2	3.50	0.902	
	CTS2	3.55	0.831			FOP3	3.42	0.911	
	CTS3	3.65	0.859			FOP4	3.50	0.923	
	CTS4	3.48	0.854			FOP5	3.57	0.869	
	CTS5	3.66	0.861			NOP1	3.58	0.905	
IT Readiness	ITR1	3.54	0.792	3.4897		NOP2	3.50	0.882	
	ITR2	3.44	0.842			NOP3	3.44	0.941	
	ITR3	3.48	0.786			NOP4	3.44	0.921	
	ITR4	3.43	0.806			NOP5	3.58	0.920	
	ITR5	3.56	0.807						
Perceived Trust	TRS1	3.63	0.795	3.5719					
	TRS2	3.54	0.834						
	TRS3	3.52	0.819						
	TRS4	3.53	0.831						
	TRS5	3.63	0.863						

6.4 PLS-SEM Model Assessment

Structural Equation Modeling (SEM) was employed to test the research model hypotheses in this study because SEM enables the author to model the association of several endogenous (dependent) and exogenous (independent) constructs concurrently towards examining the overall fit of the model as well as to measure the relationships between the model constructs. (Fornell & Larcker, 1981b; Ramayah et al., 2018). Accordingly, PLS-SEM approach was deployed using SmartPLS version 3 to empirically assess the developed research model. The evaluation of the proposed research model was carried out based on a two-step approach which comprises assessing the measurement model and then assessing the structural model.

6.4.1 Assessment of Measurement Model

A measurement model refers to the description of the way latent constructs and their measurement items are interrelated. Thus, the assessment of the measurement model is an important step to be carried out before proceeding to test the hypotheses in the developed research model. Therefore, this phase of assessment helps to examine the validity and reliability of the model constructs and items (Hair Jr et al., 2016; Ramayah et al., 2018), based on the measurement model (outer model) assessment which identifies the relationships between the items (76 reflective indicators) and their latent variables (14 reflective constructs). Therefore, this study conceptualized the 14 latent variables as reflective construct measurement similar to prior studies (Podsakoff et al., 2003; Ramayah et al., 2018) in analyzing the measurement model to ensure that the measures employed are comprehensive and they possess the sufficient theoretical components. The assessment of the reflective measurement model was carried out using four main assessment criteria including internal consistency reliability, indicator reliability, convergent validity, and discriminant validity. As previously discussed the methods required in assessing the measurement model has been discussed in Section 3.8.4.1.

Accordingly, Figure 6.1 represents the measurement model deployed in Smart PLS 3.

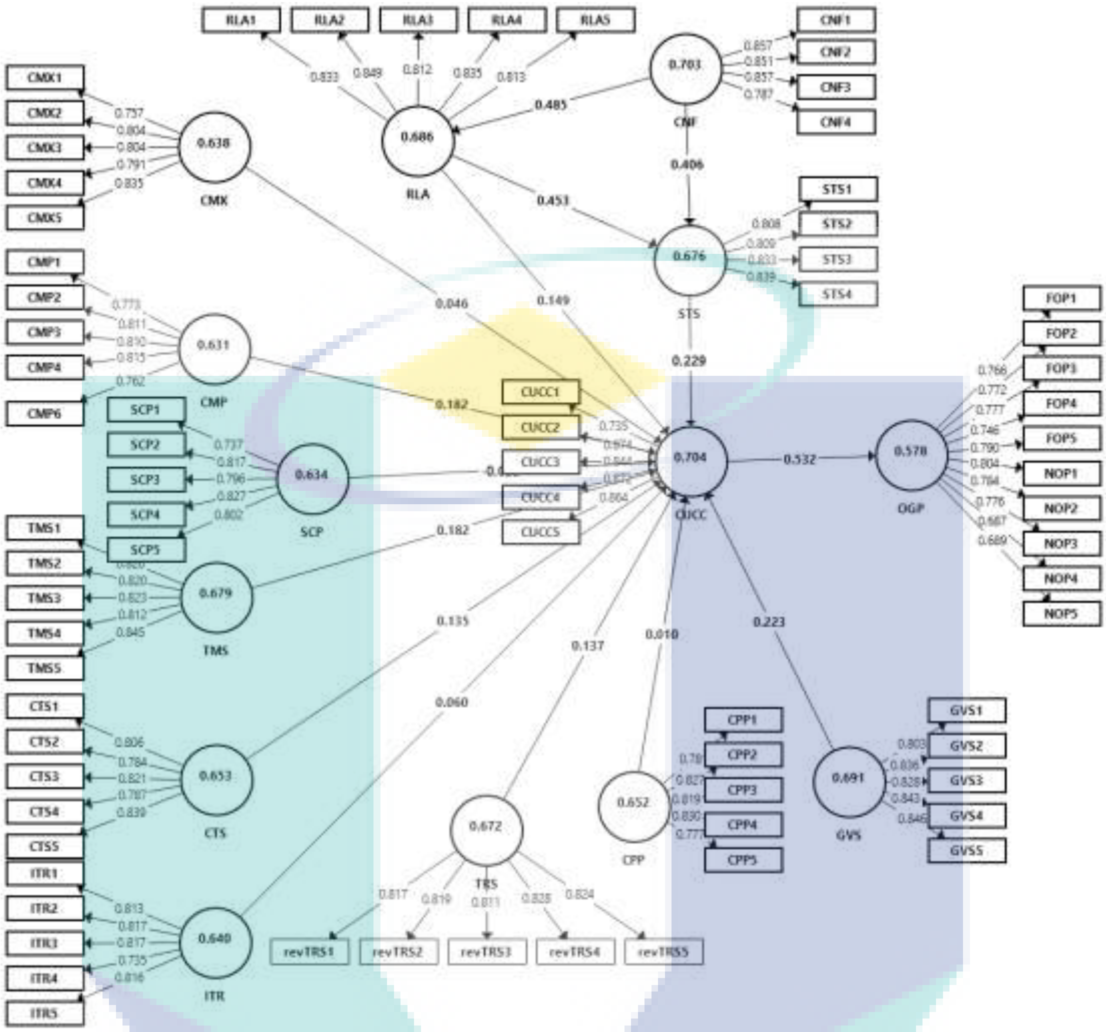

Figure 6.1 The Measurement Model

6.4.1.1 Indicator Reliability

The indicator or item reliability of the measurement model was evaluated by examining the factor loadings for all constructs items, where the factor loading measure how well the indicators load on their own construct as compared to other constructs in the research model. Thus, to determine if the measurement model has a satisfactory indicator reliability, each factor loading should have the value of 0.708 and above as recommended by (Hair Jr et al., 2016). Besides, a higher factor loadings value ranging from 0.7 to 0.9 indicate a higher level or degree of confidence indicating that the measurement items effectively measures the assigned construct (Chin, 2010).

Table 6.5 shows that there are 76 indicators (items) for all the 14 constructs which includes Compatibility (CMP1-CMP6), Complexity (CMX1-CMX5), Confirmation (CNF1-CNF4), Competitive Pressure (CPP1-CPP6), Cost Saving (CTS1-CTS5), Continuance Use of Cloud Computing (CUCC1-CUCC6), Government Support (GVS1-GVS5), IT Readiness (ITR1-ITR5), Organizational Performance (nFOP1- NOP5), Relative Advantage (RLA1-RLA5), Perceived Security and Privacy (SCP1-SCP5), Satisfaction (STS1-STS4), Top Management Support (TMS1-TMS5), and Perceived Trust (TRS1-TRS5).

Table 6.5 Indicator Reliability Meaurement

Construct	Items	Initial Factor loading	Revised Factor loading
Compatibility (CMP)	CMP1	0.763	0.773
	CMP2	0.794	0.811
	CMP3	0.806	0.810
	CMP4	0.804	0.815
	CMP5	0.491	Deleted
	CMP6	0.774	0.762
Complexity (CMX)	CMX1	0.755	0.757
	CMX2	0.805	0.804
	CMX3	0.805	0.804
	CMX4	0.789	0.791
	CMX5	0.838	0.835
Confirmation (CNF)	CNF1	0.857	0.857
	CNF2	0.851	0.851
	CNF3	0.857	0.857
	CNF4	0.787	0.787
Competitive Pressure (CPP)	CPP1	0.773	0.781
	CPP2	0.814	0.827
	CPP3	0.803	0.819
	CPP4	0.815	0.830
	CPP5	0.782	0.777
	CPP6	0.654	Deleted
Cost Saving (CTS)	CTS1	0.805	0.806
	CTS2	0.785	0.784
	CTS3	0.820	0.821
	CTS4	0.788	0.787
	CTS5	0.840	0.839
Continuance Use of Cloud Computing Adoption (CUCC)	CUCC1	0.722	0.733
	CUCC2	0.861	0.875
	CUCC3	0.840	0.843
	CUCC4	0.865	0.873
	CUCC5	0.858	0.864
	CUCC6	0.611	Deleted

Table 6.5 Continued

Construct	Items	Initial Factor loading	Revised Factor loading
Government Support (GVS)	GVS1	0.802	0.803
	GVS2	0.836	0.836
	GVS3	0.828	0.828
	GVS4	0.844	0.843
	GVS5	0.846	0.846
IT Readiness (ITR)	ITR1	0.814	0.813
	ITR2	0.818	0.817
	ITR3	0.817	0.817
	ITR4	0.733	0.735
	ITR5	0.815	0.816
Organizational Performance (OGP)	nFOP1	0.768	0.766
	nFOP2	0.775	0.772
	nFOP3	0.780	0.777
	nFOP4	0.749	0.746
	nFOP5	0.791	0.790
	NOP1	0.802	0.804
	NOP2	0.782	0.784
	NOP3	0.774	0.776
	NOP4	0.683	0.687
	NOP5	0.686	0.689
Relative Advantage (RLA)	RLA1	0.833	0.833
	RLA2	0.849	0.849
	RLA3	0.812	0.812
	RLA4	0.835	0.835
	RLA5	0.813	0.813
Perceived Security and Privacy (SCP)	SCP1	0.736	0.737
	SCP2	0.817	0.816
	SCP3	0.795	0.796
	SCP4	0.828	0.827
	SCP5	0.803	0.802
Satisfaction (STS)	STS1	0.809	0.810
	STS2	0.809	0.807
	STS3	0.832	0.832
	STS4	0.840	0.840
Top Management Support (TMS)	TMS1	0.820	0.820
	TMS2	0.819	0.820
	TMS3	0.824	0.823
	TMS4	0.812	0.812
	TMS5	0.844	0.845
Perceived Trust (TRS)	TRS1	0.816	0.817
	TRS2	0.820	0.819
	TRS3	0.810	0.811
	TRS4	0.828	0.828
	TRS5	0.825	0.824

Results from Table 6.5 depict that in the first iteration of running PLS algorithm, the factor loading for CMP5, CPP6, CUCC6, NOP4 and NOP5 were below the cut-off 0.708 and cause low AVE value as recommended by (Hair Jr et al., 2016). Therefore, after running PLS algorithm again the second time, the result confirmed that deletion of those three indicators increased the values for factor loading of other indicators. The three deleted indicators were not relatively high as compared to the total indicators in the constructs (76 indicators). Furthermore, the removal does not significantly change the content of the constructs as they are conceptualized. Then, the PLS algorithm was carried out once again for the rest of the 73 indicators. The revised model with 73 remaining indicators was again tested to ensure whether the structure of the constructs remained stable. Thus, the results of revised factor loading as shown in Table 6.5 ranges from 0.733 for CUCC1 to 0.875 for CUCC2 in continues use of cloud computing construct and the lowest is NOP4 and NOP5 for organizational performance construct were retain which have a factor loading of 0.687 and 0.689 respectively. Hence, the revised measurement models with 73 indicators factor loading are within the recommended benchmark thus the reliability of the indicators have been confirmed.

6.4.1.2 Internal Consistency Reliability

The internal consistency reliability is a technique used to evaluate the internal consistency of constructs in the measurement model (Hair Jr et al. (2016). It helps to assess if the items measuring a construct are similar in their scores (for instance if the correlations between the items are large). Thus, in this study, the internal consistency reliability of the measurement model was assessed by considering the Cronbach’s alpha (CA) and composite reliability (CR) value of the constructs. Although, prior researchers utilized the CA value to assess the internal consistency of measured constructs. However, in measuring the internal consistency CA assumes that the outer loadings of all measures in a construct are equal, thus it is sensitive to the number of measures in the construct.

Therefore, (Hair Jr et al., 2016) recommended that the internal consistency reliability should be assessed using CA and CR when conducting statistical analysis in PLS-SEM. Besides, CA and CR are commonly utilized criteria for checking evaluation of reflective measurement constructs in PLS-SEM (Hair Jr et al. (2016). The benchmark for CA should be equal to and greater than 0.60 to be acceptable and values of 0.70 and above are also satisfactory. Likewise, for CR the values should be between 0.60 to 0.70 for exploratory research and values from 0.70 to 0.90 are regarded as satisfactory, whereas values below 0.60 indicate a lack of reliability (Hair et al., 2011). Table 6.6 showes the internal consistency reliability results.

Results from Table 6.6 present the CA value for each construct in this measurement model, where the results show that all constructs CA values ranges from 0.840 to 0.918, which is well above the threshold value of 0.7. Similarly, for CR all values exceeded the minimum acceptable value of 0.70 which suggest that the CR results are acceptable in terms of internal consistency. Thus, by considering the results of CA and CR values, it is evident that CR is indeed a stronger measuring criterion for assessing the internal consistency reliability. Thus, the results of CA and CR indicate that the examined constructs in the measurement model provides sufficient evidence in terms of internal consistency reliability.

Table 6.6 Internal Consistency Reliability Results

Constructs	**Cronbach's Alpha**	**rho_A**	**Composite Reliability**
Compatibility	0.854	0.855	0.895
Complexity	0.858	0.860	0.898
Confirmation	0.859	0.860	0.904
Competitive Pressure	0.866	0.868	0.903
Cost Saving	0.867	0.869	0.904
Continuance Use of Cloud Computing Adoption	0.894	0.893	0.922
Government Support	0.888	0.890	0.918
IT Readiness	0.859	0.862	0.899
Organizational Performance	0.918	0.921	0.932
Relative Advantage	0.886	0.886	0.916
Perceived Security and Privacy	0.855	0.857	0.896
Satisfaction	0.840	0.840	0.893
Top Management Support	0.882	0.884	0.914
Perceived Trust	0.878	0.879	0.911

Composite reliability = (square of the summation of the factor loadings)/[(square of the summation of the factor loadings) + (square of the summation of the error variances)].

6.4.1.3 Convergent Validity

The convergent validity refers “to the degree in which individual indicators of a specific construct should converge or share a high proportion of variance in common in comparison to indicators measuring other constructs” (Hair Jr et al., 2016). The convergent validity of each construct can be assessed by considering the Average Variance Extracted (AVE) value (Fornell & Larcker, 1981). However, for a measurement model to have adequate convergent validity, the AVE of the items measuring the construct should exceed 0.5 benchmark (Hair Jr et al., 2016), implying that the indicators has proper convergent validity (Henseler et al., 2009). Table 6.7 shoes the test of convergent validity.

Table 6.7 Test of Convergent Validity

Constructs	**Average Variance Extracted (AVE)**
Compatibility	0.631
Complexity	0.638
Confirmation	0.703
Competitive Pressure (	0.652
Cost Saving	0.653
Continuance Use of Cloud Computing Adoption	0.704
Government Support	0.691
IT Readiness	0.640
Organizational Performance	0.578
Relative Advantage	0.686
Perceived Security and Privacy	0.634
Satisfaction	0.676
Top Management Support	0.679
Perceived Trust	0.672

Average Variance Extracted = (summation of the square of the factor loadings)/[(summation of the square of the factor loadings) + (summation of the error variances)].

Therefore, results from Table 6.7 show the convergent validity AVE values of the model constructs, where the result reveal that the AVE values are greater than the acceptable threshold of 0.5, ranging from 0.570 to 0.704, so convergent validity is confirmed.

6.4.1.4 Discriminant Validity

Discriminant validity is the degree to which the measures of a construct do not correlate with the measures of any other construct, which are not designed to assess the same construct in the same measurement model (Hair Jr et al., 2016). Thus, discriminant validity measures the extent to which construct is truly distinct from other constructs by empirical standards.

Therefore, all constructs should be more correlated with their own measures than with other constructs. Moreover, as previously mentioned (See 3.8.4.1) three criteria are commonly employed to assess the discriminant validity of each construct and they include, cross loading for indicators level discriminant validity, Fornell-Larcker criterion and Heterotrait-Monotrait ratio of Correlations (HTMT) for construct level discriminant validity.

Results from Table 6.8 show the discriminant validity of the constructs based on Fornell-Larker criterion. The results show that all the square root of all constructs' AVE exceeds the constructs' correlations. Therefore, results presented in Table 6.8 indicate that all constructs satisfied the discriminant validity based on the approach presented in (Fornell & Larcker, 1981; Hair Jr et al., 2016).

Similarly, results from Table 6.9 depict the inter-correlations between the constructs ranged from 0.287 (correlation between CMX and CNF) to 0.875 (correlation between STS and SCP), which were below the threshold 0.90. Therefore, results from Table 6.9 confirms that each latent construct measurement was totally discriminating to each other based on Fornell-Larcker and HTMT criterion as recommended by (Franke & Sarstedt, 2018; Henseler et al., 2015).

Furthermore, in order to confirm the discriminant validity levels of the indicators, both loading and cross-loading matrix were performed. Thus, results from Table 6.10 show that each construct indicator measurement value is greater than all of its cross-loadings in row and column. Therefore, the results from Table 6.10 confirm that the measurement model has strong discriminant validity at the indicators level.

In conclusion, the results from Table 6.8 to Table 6.10 derived from four different methods of assessing the discriminant validity levels of the constructs in the measurement model (outer model) assessment validate that all the construct measures are reliable and valid in this study. Therefore, the author proceeds to test the structural model (inner model) assessment in validating the research model developed in Chapter 3.

Table 6.8 Discriminant Validity Based on Fornell-Larker Criterion

	CMP	CMX	CNF	CPP	CTS	CUCC	GVS	ITR	OGP	RLA	SCP	STS	TMS	TRS
CMP	**0.795**													
CMX	0.419	**0.799**												
CNF	0.393	0.248	**0.838**											
CPP	0.595	0.416	0.424	**0.807**										
CTS	0.671	0.510	0.462	0.631	**0.808**									
CUCC	0.707	0.513	0.580	0.648	0.747	**0.839**								
GVS	0.592	0.500	0.444	0.662	0.662	0.748	**0.831**							
ITR	0.581	0.560	0.396	0.661	0.665	0.657	0.650	**0.800**						
OGP	0.567	0.327	0.365	0.538	0.588	0.532	0.521	0.528	**0.760**					
RLA	0.599	0.414	0.485	0.590	0.600	0.679	0.560	0.495	0.435	**0.828**				
SCP	0.638	0.439	0.469	0.658	0.646	0.686	0.637	0.572	0.587	0.632	**0.796**			
STS	0.576	0.390	0.625	0.621	0.661	0.738	0.649	0.552	0.613	0.649	0.742	**0.822**		
TMS	0.657	0.479	0.419	0.644	0.691	0.745	0.659	0.640	0.559	0.588	0.664	0.613	**0.824**	
TRS	0.566	0.374	0.361	0.638	0.531	0.487	0.525	0.540	0.481	0.545	0.529	0.522	0.512	**0.820**

CMP = Compatibility , CMX= Complexity; CNF= Confirmation, CPP= Competitive pressure, CTS = Cost saving, GVS = Government support, ITR =IT readiness, OGP = Organizational Performance, RLA = Relative advantage, SCP= Security and privacy, STS= Satisfaction, CUCC = Continuance use of cloud computing, TMS= Top management support, TRS= Perceived Trust

Table 6.9 Discriminant Validity Based on HTMT

	CMP	CMX	CNF	CPP	CTS	CUCC	GVS	ITR	OGP	RLA	SCP	STS	TMS	TRS
CMP														
CMX	0.487													
CNF	0.459	0.287												
CPP	0.691	0.480	0.490											
CTS	0.778	0.592	0.535	0.725										
CUCC	0.807	0.582	0.663	0.733	0.847									
GVS	0.678	0.571	0.508	0.753	0.754	0.838								
ITR	0.675	0.650	0.460	0.765	0.767	0.746	0.743							
OGP	0.637	0.365	0.410	0.598	0.658	0.582	0.576	0.590						
RLA	0.689	0.473	0.554	0.671	0.684	0.763	0.629	0.564	0.479					
SCP	0.745	0.512	0.548	0.763	0.749	0.782	0.730	0.665	0.658	0.726				
STS	0.680	0.459	0.735	0.727	0.773	0.851	0.751	0.647	0.693	0.752	0.875			
TMS	0.754	0.549	0.481	0.732	0.788	0.837	0.745	0.732	0.619	0.664	0.762	0.711		
TRS	0.653	0.430	0.413	0.728	0.607	0.549	0.593	0.618	0.533	0.618	0.610	0.607	0.580	

CMP = Compatibility , CMX= Complexity; CNF= Confirmation, CPP= Competitive pressure, CTS = Cost saving, GVS = Government support, ITR =IT readiness, OGP = Organizational Performance, RLA = Relative advantage, SCP= Security and privacy, STS= Satisfaction, CUCC = Continuance use of cloud computing, TMS= Top management support, TRS= Perceived Trust

Table 6.10 Discriminant Validity Based on Cross Loading of Reflective Indicators Matrix

	CMP	**CMX**	**CNF**	**CPP**	**CTS**	**CUCC**	**GVS**	**ITR**	**OGP**	**RLA**	**SCP**	**STS**	**TMS**	**TRS**
CMP1	**0.773**	0.364	0.296	0.488	0.534	0.572	0.448	0.442	0.468	0.459	0.512	0.464	0.548	0.479
CMP2	**0.811**	0.336	0.309	0.487	0.532	0.591	0.462	0.468	0.462	0.481	0.512	0.469	0.546	0.423
CMP3	**0.81**	0.308	0.332	0.454	0.523	0.525	0.441	0.436	0.420	0.48	0.472	0.439	0.473	0.441
CMP4	**0.815**	0.366	0.313	0.473	0.579	0.586	0.503	0.510	0.479	0.479	0.530	0.446	0.537	0.461
CMP6	**0.762**	0.284	0.312	0.46	0.495	0.527	0.495	0.447	0.417	0.483	0.505	0.471	0.499	0.445
CMX1	0.331	**0.757**	0.178	0.301	0.372	0.439	0.348	0.430	0.272	0.32	0.309	0.300	0.372	0.281
CMX2	0.343	**0.804**	0.192	0.37	0.41	0.393	0.406	0.473	0.257	0.336	0.366	0.331	0.393	0.323
CMX3	0.333	**0.804**	0.187	0.309	0.403	0.365	0.378	0.42	0.251	0.348	0.349	0.288	0.368	0.305
CMX4	0.316	**0.791**	0.194	0.315	0.435	0.391	0.424	0.444	0.245	0.282	0.351	0.307	0.394	0.249
CMX5	0.346	**0.835**	0.235	0.362	0.417	0.446	0.438	0.468	0.276	0.365	0.377	0.329	0.384	0.332
CNF1	0.352	0.243	**0.857**	0.356	0.378	0.516	0.408	0.342	0.302	0.449	0.407	0.530	0.362	0.353
CNF2	0.309	0.186	**0.851**	0.316	0.378	0.507	0.362	0.336	0.294	0.362	0.382	0.500	0.331	0.294
CNF3	0.315	0.204	**0.857**	0.339	0.389	0.518	0.34	0.336	0.234	0.408	0.354	0.544	0.358	0.274
CNF4	0.339	0.195	**0.787**	0.41	0.405	0.404	0.378	0.315	0.397	0.400	0.43	0.521	0.351	0.286
CPP1	0.504	0.363	0.341	**0.781**	0.527	0.569	0.573	0.549	0.490	0.54	0.563	0.543	0.575	0.589
CPP2	0.457	0.349	0.336	**0.827**	0.515	0.522	0.533	0.553	0.439	0.432	0.510	0.465	0.491	0.523
CPP3	0.468	0.313	0.39	**0.819**	0.494	0.519	0.509	0.520	0.411	0.493	0.572	0.521	0.516	0.470
CPP4	0.477	0.318	0.335	**0.83**	0.512	0.520	0.527	0.512	0.435	0.440	0.509	0.478	0.521	0.473
CPP5	0.494	0.331	0.307	**0.777**	0.497	0.477	0.526	0.533	0.386	0.470	0.495	0.495	0.487	0.511
CTS1	0.557	0.412	0.412	0.513	**0.806**	0.620	0.559	0.577	0.492	0.500	0.562	0.562	0.635	0.443
CTS2	0.479	0.412	0.301	0.456	**0.784**	0.588	0.540	0.477	0.444	0.477	0.506	0.528	0.536	0.409
CTS3	0.565	0.446	0.385	0.543	**0.821**	0.629	0.535	0.537	0.464	0.473	0.567	0.527	0.543	0.394
CTS4	0.519	0.407	0.367	0.458	**0.787**	0.552	0.489	0.52	0.475	0.465	0.457	0.476	0.489	0.400
CTS5	0.586	0.382	0.399	0.572	**0.839**	0.623	0.546	0.573	0.501	0.507	0.511	0.572	0.582	0.495
CUCC1	0.584	0.432	0.349	0.610	0.620	**0.733**	0.671	0.565	0.526	0.497	0.631	0.597	0.591	0.428
CUCC2	0.584	0.433	0.495	0.559	0.653	**0.875**	0.629	0.562	0.409	0.561	0.557	0.607	0.643	0.412
CUCC3	0.593	0.429	0.516	0.506	0.622	**0.843**	0.600	0.541	0.461	0.588	0.557	0.628	0.607	0.394
CUCC4	0.602	0.425	0.527	0.509	0.612	**0.873**	0.610	0.542	0.405	0.613	0.565	0.633	0.64	0.411

Table 6.10 Continued

	CMP	CMX	CNF	CPP	CTS	CUCC	GVS	ITR	OGP	RLA	SCP	STS	TMS	TRS
CUCC5	0.596	0.427	0.546	0.527	0.620	**0.864**	0.619	0.538	0.422	0.586	0.559	0.621	0.638	0.395
FOP1	0.425	0.251	0.334	0.485	0.480	0.440	0.416	0.432	**0.766**	0.388	0.550	0.567	0.448	0.419
FOP2	0.395	0.198	0.279	0.402	0.422	0.361	0.353	0.383	**0.772**	0.357	0.41	0.444	0.410	0.389
FOP3	0.468	0.304	0.324	0.456	0.479	0.448	0.371	0.429	**0.777**	0.391	0.461	0.498	0.46	0.401
FOP4	0.437	0.232	0.277	0.403	0.438	0.353	0.363	0.406	**0.746**	0.293	0.371	0.428	0.409	0.385
FOP5	0.446	0.243	0.258	0.440	0.469	0.431	0.367	0.412	**0.790**	0.363	0.455	0.475	0.421	0.370
GVS1	0.466	0.377	0.369	0.543	0.552	0.586	**0.803**	0.584	0.478	0.45	0.54	0.544	0.572	0.462
GVS2	0.496	0.443	0.337	0.545	0.564	0.618	**0.836**	0.561	0.354	0.459	0.507	0.529	0.54	0.418
GVS3	0.436	0.369	0.352	0.520	0.534	0.600	**0.828**	0.516	0.426	0.416	0.462	0.503	0.524	0.407
GVS4	0.521	0.443	0.417	0.561	0.545	0.663	**0.843**	0.505	0.433	0.490	0.562	0.570	0.539	0.454
GVS5	0.534	0.440	0.369	0.582	0.556	0.637	**0.846**	0.539	0.476	0.510	0.574	0.550	0.567	0.440
ITR1	0.518	0.470	0.347	0.549	0.579	0.548	0.518	**0.813**	0.473	0.422	0.508	0.472	0.522	0.480
ITR2	0.443	0.444	0.29	0.505	0.511	0.515	0.499	**0.817**	0.398	0.356	0.448	0.415	0.455	0.406
ITR3	0.429	0.438	0.305	0.551	0.506	0.494	0.484	**0.817**	0.404	0.385	0.413	0.424	0.503	0.413
ITR4	0.438	0.404	0.297	0.48	0.476	0.481	0.492	**0.735**	0.382	0.352	0.425	0.399	0.493	0.388
ITR5	0.488	0.480	0.341	0.556	0.577	0.579	0.596	**0.816**	0.446	0.456	0.487	0.489	0.58	0.464
NOP1	0.422	0.282	0.214	0.373	0.445	0.396	0.416	0.412	**0.804**	0.312	0.442	0.46	0.467	0.301
NOP2	0.451	0.223	0.305	0.37	0.445	0.405	0.426	0.400	**0.784**	0.299	0.461	0.484	0.419	0.337
NOP3	0.468	0.265	0.323	0.416	0.447	0.440	0.479	0.435	**0.776**	0.346	0.459	0.509	0.446	0.380
NOP4	0.368	0.214	0.235	0.358	0.388	0.348	0.364	0.328	**0.687**	0.236	0.388	0.354	0.365	0.327
NOP5	0.413	0.257	0.210	0.364	0.443	0.39	0.389	0.358	**0.689**	0.295	0.434	0.403	0.387	0.337
RLA1	0.509	0.394	0.408	0.538	0.499	0.599	0.511	0.459	0.349	**0.833**	0.533	0.571	0.515	0.459
RLA2	0.498	0.370	0.414	0.485	0.511	0.569	0.492	0.403	0.349	**0.849**	0.534	0.548	0.482	0.449
RLA3	0.475	0.328	0.421	0.484	0.484	0.527	0.412	0.398	0.363	**0.812**	0.526	0.532	0.451	0.439
RLA4	0.506	0.297	0.357	0.456	0.525	0.568	0.449	0.378	0.366	**0.835**	0.498	0.527	0.497	0.464
RLA5	0.493	0.323	0.406	0.478	0.465	0.548	0.452	0.411	0.377	**0.813**	0.525	0.51	0.489	0.447
SCP1	0.492	0.349	0.372	0.536	0.522	0.521	0.486	0.455	0.441	0.447	**0.737**	0.591	0.526	0.369
SCP2	0.533	0.404	0.392	0.526	0.505	0.583	0.523	0.492	0.500	0.511	**0.816**	0.611	0.547	0.436
SCP3	0.497	0.317	0.382	0.497	0.498	0.509	0.472	0.431	0.452	0.512	**0.796**	0.577	0.474	0.420

Table 6.10 Continued

	CMP	CMX	CNF	CPP	CTS	CUCC	GVS	ITR	OGP	RLA	SCP	STS	TMS	TRS
SCP4	0.531	0.336	0.369	0.523	0.510	0.566	0.507	0.448	0.465	0.521	**0.827**	0.578	0.518	0.449
SCP5	0.483	0.338	0.354	0.537	0.538	0.545	0.546	0.45	0.475	0.523	**0.802**	0.597	0.575	0.430
STS1	0.497	0.331	0.561	0.547	0.555	0.575	0.493	0.447	0.558	0.547	0.642	**0.810**	0.512	0.439
STS2	0.501	0.329	0.479	0.519	0.548	0.632	0.536	0.448	0.489	0.506	0.602	**0.807**	0.511	0.443
STS3	0.437	0.318	0.476	0.491	0.549	0.625	0.582	0.459	0.497	0.542	0.600	**0.832**	0.524	0.431
STS4	0.459	0.306	0.54	0.487	0.522	0.594	0.526	0.462	0.472	0.541	0.597	**0.840**	0.470	0.405
TMS1	0.560	0.433	0.343	0.57	0.583	0.636	0.587	0.538	0.480	0.54	0.621	0.523	**0.820**	0.435
TMS2	0.555	0.371	0.301	0.503	0.545	0.604	0.512	0.519	0.440	0.467	0.504	0.466	**0.820**	0.375
TMS3	0.517	0.401	0.339	0.516	0.587	0.570	0.545	0.507	0.486	0.463	0.536	0.504	**0.823**	0.466
TMS4	0.506	0.339	0.395	0.489	0.523	0.589	0.501	0.503	0.439	0.474	0.483	0.490	**0.812**	0.384
TMS5	0.563	0.423	0.348	0.568	0.606	0.662	0.567	0.566	0.460	0.475	0.582	0.539	**0.845**	0.447
TRS1	0.507	0.307	0.316	0.544	0.442	0.405	0.471	0.466	0.383	0.504	0.475	0.498	0.452	**0.817**
TRS2	0.433	0.334	0.265	0.495	0.412	0.379	0.391	0.426	0.353	0.395	0.413	0.359	0.412	**0.819**
TRS3	0.452	0.273	0.263	0.511	0.413	0.381	0.391	0.39	0.391	0.442	0.441	0.418	0.368	**0.811**
TRS4	0.465	0.323	0.308	0.512	0.458	0.413	0.436	0.484	0.421	0.46	0.403	0.409	0.452	**0.828**
TRS5	0.462	0.296	0.322	0.55	0.449	0.416	0.456	0.444	0.419	0.432	0.438	0.453	0.409	**0.824**

CMP = Compatibility , CMX= Complexity; CNF= Confirmation, CPP= Competitive pressure, CTS = Cost saving, GVS = Government support, ITR =IT readiness, OGP = Organizational Performance, RLA = Relative advantage, SCP= Security and privacy, STS= Satisfaction, CUCC = Continuance use of cloud computing, TMS= Top management support, TRS= Perceived Trust

6.4.2 Assessment of the Structural Model

The structural model provides details on the association between the constructs as showen in Figure 6.2. It shows the specific details of the relationship between the endogenous constructs (Continuance Use of Cloud Computing, Relative Advantage, Satisfaction, Organizational Performance) and exogenous constructs (Relative Advantage, Compatibility, Complexity, Confirmation, Competitive Pressure, Cost Saving, Government Support, IT Readiness, Security and Privacy, Satisfaction, Top Management Support, and Perceived Trust).

Thus, having confirmed reliability and validity of the measurement model, the next step is the measurement of the structural model (inner model) assessment in PLS-SEM. The structural model assessment was performed to test the developed hypotheses relationships in the proposed research model, which is the relationship between the TOE factors and continues use of cloud computing services as well as the continues use of cloud computing services and organizations performance.

Figure 6.2 presents the graphical representation of the structural model showing the path coefficients and T-value results. As discussed previously in Section 3.9.4.2, the main evaluation criteria for the structural model encompasses test of collinearity assessment, path coefficients, coefficient of determination (R^2), effect size (f^2), and predictive relevance (Q^2). The following subsections discuss the statistical tests carried out to assess the validity of the structural model in this study.

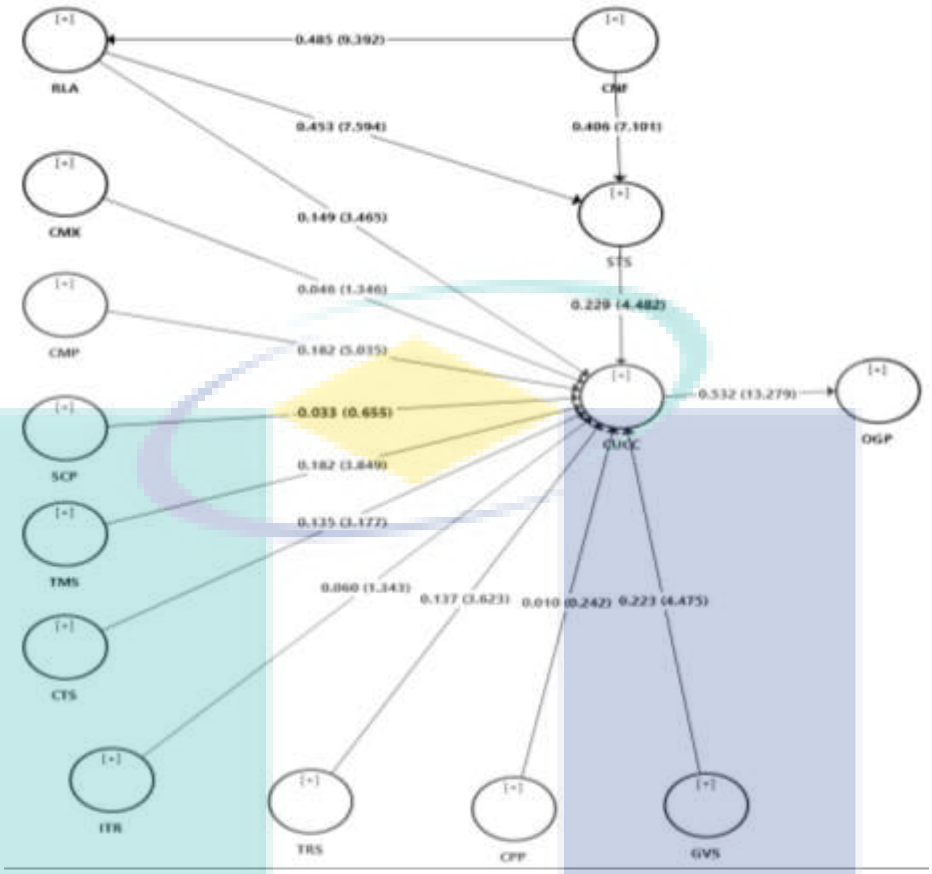

Figure 6.2 The Graphical Representation Of The Structural Model

6.4.2.1 Assessment of the Structural Model Collinearity Issues

In assessing structural model, test of collinearity was first assessed by examining the structural model for collinearity issues. Accordingly to Hair Jr et al. (2016) test of collinearity should be conducted prior to analyzing the path coefficient, because the path coefficients might be biased if there is a present of collinearity issues among the constructs. Hence, it is required to carry out test of collinearity on each constructs to be examined. Accordingly, this study comprises of endogenous constructs which influences continues use of cloud computing construct which is the predictor of TOE factors. Thus, in the proposed model organization performance predicts continues use of cloud computing and relative advantage. Moreover, confirmation construct predict satisfaction, where confirmation is defined as predictors of the relative advantage. Therefore, to empirically test for collinearity, this study employs two measures which comprises of test tolerance and test of Variance Inflation Factor (VIF). Table 6.11 present the results of collinearity test.

Table 6.11 Test of Collinearity

Dependent Variables	Independent Variables	Collinearity Statistics	
		Tolerance	VIF
CUCC	CMP	0.403	2.482
	CMX	0.624	1.602
	CPP	0.336	2.975
	CTS	0.348	2.878
	GVS	0.383	2.612
	ITR	0.385	2.594
	RLA	0.450	2.223
	SCP	0.333	3.001
	STS	0.349	2.865
	TMS	0.378	2.643
	TRS	0.508	1.970
OGP	CUCC	1.000	1.000
STS	RLA	0.766	1.305
	CNF	0.766	1.305
RLA	CNF	1.000	1.000

CMP = Compatibility, CMX= Complexity; CNF= Confirmation, CPP= Competitive pressure, CTS = Cost saving, GVS = Government support, ITR =IT readiness, OGP = Organizational Performance, RLA = Relative advantage, SCP= Security and privacy, STS= Satisfaction, CUCC = Continuance use of cloud computing, TMS= Top management support, TRS= Perceived Trust

According to Hair Jr, Hult, Ringle, & Sarstedt (2013); Hair Jr et al. (2016), a tolerance value of 0.20 or lower and VIF value of 5 or higher is required to confirm that there is absent of collinearity among the research model constructs. Likewise, a more stringent criteria as suggested by Diamantopoulos and Siguaw (2006) where VIF value of 3.3 or above can be employed to test for potential collinearity problem. Results from Table 6.11 indicate that all tolerance values are more than 0.20 and all VIF values range from 1.00 to 3.001, which were below threshold value of 3.33. Thus it is evident that there is lack of collinearity issue in the proposed research model.

6.4.2.2 Path Coefficients

This phase of the analysis in PLS-SEM involves the estimation of the magnitude and significance of path coefficients of the model hypotheses and their corresponding t-values were evaluated through the Smart PLS by employing bootstrapping technique based on 5,000 re-samples as recommended by Chin (1998b); Hair Jr et al. (2016). Accordingly, the author examined the path coefficient (ß) measures in testing all Fifteen hypotheses presented in the proposed model. Thus, according to (Hair Jr et al., 2016) the path coefficient value for each relationship or hypothesis should have a value between -1 and +1. Besides, if the path coefficients value is close to +1 it suggests that there is a significantly positive correlation between the two constructs. Similarly, if the path coefficients value is close to -1 it mainly suggest that there is a significantly negative correlation between the two constructs (Hair Jr et al., 2016). Therefore, in this study, the path coefficient value is employed to measure the significant level of the hypotheses in the proposed model presented in Chapter 4. Table 6.12 showes the path coefficients and T-statistics analysis

Table 6.12 Path Coefficients and T-Statistics Analysis

Independent Variables	**Dependent Variables**	**Path Coefficient**	**T-statistics**	**P Values**
CMP	CUCC	0.182	4.942	0.000
CMX	CUCC	0.046	1.373	0.085
CNF	RLA	0.485	9.217	0.000
CNF	STS	0.406	7.066	0.000
CPP	CUCC	0.010	0.238	0.406
CTS	CUCC	0.135	3.228	0.001
CUCC	OGP	0.532	13.183	0.000
GVS	CUCC	0.223	4.469	0.000
ITR	CUCC	0.060	1.347	0.089
RLA	CUCC	0.149	3.492	0.000
RLA	STS	0.453	7.532	0.000
SCP	CUCC	-0.033	0.665	0.253
STS	CUCC	0.229	4.462	0.000
TMS	CUCC	0.182	3.829	0.000
TRS	CUCC	0.137	3.551	0.000

CMP = Compatibility, CMX= Complexity; CNF= Confirmation, CPP= Competitive pressure, CTS = Cost saving, GVS = Government support, ITR =IT readiness, OGP = Organizational Performance, RLA = Relative advantage, SCP= Security and privacy, STS= Satisfaction, CUCC = Continuance use of cloud computing, TMS= Top management support, TRS= Perceived Trust

Results from in Table 6.12 reveal that the path coefficient estimates which indicate that the relationships between among the hypothesized constructs are small, medium and large since the value ranged from -0.033 to 0.532, at the *p*= <0.005 level.

6.4.2.3 Assessment the Coefficient of Determination (R^2)

In assessing the measurement model, another commonly adopted approach is the coefficient of determination also known as R^2 value which is known as the percentage of variance in the dependent variables explained or predicted by the independent variable or exogenous constructs (Hair et al., 2012). Thus, the R^2 value is deployed to evaluate the regression function's goodness of fit against the variables empirically. According to (Chin, 1998b), a model can be considered having high, moderate and weak explanatory power if R^2 value are equal or more than 0.67, 0.33 and 0.19 respectively.

Besides, the coefficient of determination (R^2 value) is used as a measure to check the predictive accuracy of the research model. Thus in this study, the proposed model comprises of four endogenous constructs which includes Continuance Use of Cloud Computing (CUCC), Organizational Performance (OGP), Relative Advantage (RLA) and Satisfaction (STS). Respectively, the four endogenous constructs R^2 values are given as 0.776, 0.281, 0.233 and 0.545. Based on these R^2 values, it is evident that the eleven predictors of TOE framework explain about 77% of the continues use of cloud computing in Malaysia SMEs, whereas the performance of Malaysia SMEs can be explained by continues use of cloud computing by 28%. Likewise, the R^2 for the construct of relative advantage is 23% as predicted by the confirmation construct in ISCM model. Finally, the results suggest that the R^2 value for satisfaction construct is high with a value of 54%. Therefore, results from Table 6.13 showes that the R^2 values satisfy the requirement for the 0.20 benchmark value as recommended by Hair Jr et al. (2016).

Table 6.13 R Square for Endogenous Constructs

Endogenous Constructs	R Square	R Square Adjusted	Result
CUCC	0.783	0.776	Strong
OGP	0.283	0.281	Weak
RLA	0.235	0.233	Weak
STS	0.548	0.545	Moderate

CUCC = Continuance use of cloud computing, OGP = Organizational Performance, RLA = Relative advantage, STS= Satisfaction.

6.4.2.4 Assessment the Effect Size (f^2)

In addition to measuring the model's predictive accuracy by checking the R2 values of all endogenous constructs, it is mandatory to assess the effect size (f2) for the exogenous constructs. The f2 effect size is the measurement of the impact of a specific exogenous construct on its related endogenous. In another words, f2 measures if an exogenous construct has a substantial impact on a endogenous construct (Hair Jr et al., 2016). In assessing f2 values the endogenous constructs should be between the values of 0.02, 0.15, and 0.35 respectively, represent small, medium, and large effects of the exogenous latent variable, where an effect size values of less than 0.02 indicates that there is no effect (Cohen, 1988; Hair Jr et al., 2016). Table 6.14 F showes the square for endogenous latent variable.

Table 6.14 F Square for Endogenous Latent Variable

Constructs Relation	F^2	Result
CMP -> CUCC	0.063	Small Effect
CMX -> CUCC	0.006	No Effect
CNF -> STS	0.278	Medium Effect
CNF -> RLA	0.307	Medium Effect
CPP -> CUCC	0.000	No Effect
CTS -> CUCC	0.029	Small Effect
CUCC -> OGP	0.395	Large Effect
GVS -> CUCC	0.088	Small Effect
ITR -> CUCC	0.006	No Effect
RLA -> STS	0.347	Medium Effect
RLA -> CUCC	0.046	Small Effect
SCP -> CUCC	0.002	No Effect
STS -> CUCC	0.084	Small Effect
TMS -> CUCC	0.056	Small Effect
TRS -> CUCC	0.045	Small Effect

CMP = Compatibility, CMX= Complexity; CNF= Confirmation, CPP= Competitive pressure, CTS = Cost saving, GVS = Government support, ITR =IT readiness, OGP = Organizational Performance, RLA = Relative advantage, SCP= Security and privacy, STS= Satisfaction, CUCC = Continuance use of cloud computing, TMS= Top management support, TRS= Perceived Trust

Thus, results from Table 6.14 depict the f^2 value, where the effect size of Continuance Use of Cloud Computing (CUCC) on the Organizational Performance (OGP) has the highest effect. This is evident since it is the only dependent variable of Organizational Performance (OGP). On the contrary, results from Table 6.14 suggest there exist very small effect (f^2 = 0.006, f^2 = 0.000, f^2 = 0.006, and f^2 = 0.002) on the Continuance Use of Cloud Computing (CUCC) for CMX, CPP, ITR, and SCP respectively.

Accordingly, Chin, Marcolin, and Newsted (2003), stated that even if the f^2 of the strength is small, there might be a possibility that the independent variables has an influence on the dependent variable. Hence, the variables CMP, CTS, GVS, RLA, STS, TMS and TRS all have small f2 size since their values are between 0.02 and 0.15.

Similarly, results from Table 6.14 indicate that CNF variable has close to medium effect on STS and RLA with values of 0.278 and 0.307 respectively.

6.4.2.5 Predictive Relevance Q^2

The predictive relevance $\mathbf{Q^2}$ is another criterion employed for the structural model assessment. This criterion is computed using the blindfolding procedure in Smart PLS. The $\mathbf{Q^2}$ measure is an indicator of the model's out-of-sample predictive power. The $\mathbf{Q^2}$ assessment is only applicable for reflective endogenous constructs. Following the guidelines suggested by Chin (1998b), the values of $\mathbf{Q^2}$ should be greater than zero indicating that an exogenous latent variables have predictive relevance for a particular endogenous latent variable.

Therefore, in this study, the blindfolding approach was employed to calculate $\mathbf{Q^2}$ values. Thus, after applying the blindfolding procedure (with D = 7) for the current study, as presented in Table 6.15. Results from Table 6.15 shows that the $\mathbf{Q^2}$ values for the four endogenous latent variables CUCC, OGP, RLA, and STS are given as of 0.510, 0.151, 0.150 and 0.346 respectively. The results from Table 6.15 confirm the predictive relevance of the associated PLS-SEM path model relationships. Hence, indicating that the structural model for this study has substantial predictive relevance.

Table 6.15 Results of Testing $\mathbf{Q^2}$ for Predictive Relevance

Endogenous Constructs	**SSO**	**SSE**	**Q^2 (=1-SSE/SSO)**
Continuance use of cloud computing	1,885.000	924.587	0.510
Organizational Performance	3,770.000	3,200.276	0.151
Relative advantage	1,885.000	1,601.899	0.150
Satisfaction	1,508.000	985.499	0.346

6.4.3 Results of Hypotheses Testing

PLS-SEM was utilized to test the hypothesized structural model, which included a test of the overall model as well as individual tests of the relationships among the latent constructs. Thus, the path estimates between the model latent constructs and T-statistics and associated p-values was examined by applying bootstrapping with 5000 replications with the aim of supporting or rejecting each research hypotheses as recommended by (Hair Jr et al., 2016). This study opted for 5000 sample when applying bootstrapping procedure to avoid bias standard errors due to non-parametric distribution in determining the confidence intervals of the path coefficients and statistical inference (Tenenhaus, Vinzi, Chatelin, & Lauro, 2005; Wong, 2013). Table 6.16 showes the summary results of hypothesis testing.

Therefore, results from Table 6.16 show the path coefficient values of 0.02, 0.15, and 0.35 indicating that the hypothesized relationships are small, medium, and large, respectively (Cohen, 1988). Likewise, by considering the significant t-values using a two-tailed test the t-values are 1.65, 1.96, and 2.58 at *p-values* of 0.10, 0.05, and 0.01, respectively (Hair et al., 2013). Furthermore, the probability value (P-value) is utilized to determine if the research has sufficient evidence to accept the hypotheses through data support. Thus, this study employs a significant and P-value less than 0.05 and t- value => 1.65 for a one-tailed test.

Correspondingly, Table 6.16 depict the results of hypotheses testing for the research model hypotheses based on the path coefficients, T-value, significance levels and confidence intervals. Results from Table 6.16 show that out of fifteen hypotheses, a total of eleven hypotheses were accepted.

Table 6.16 Summary Results of Hypothesis Testing

Hypotheses	Path	Path Coefficients	Std. Error	T-value	P-value	Decision
H1	CNF → RLA	0.485	0.053	9.217	0.000	Supported
H2	CNF → STS	0.406	0.057	7.066	0.000	Supported
H3	STS → CUCC	0.229	0.051	4.462	0.000	Supported
H4	RLA → STS	0.453	0.060	7.532	0.000	Supported
H5	RLA → CUCC	0.149	0.043	3.492	0.000	Supported
H6	CMX → CUCC	0.046	0.033	1.373	0.085	Not-Supported
H7	CMP → CUCC	0.182	0.037	4.942	0.000	Supported
H8	SCP → CUCC	-0.033	0.050	0.665	0.253	Not-Supported
H9	TMS → CUCC	0.182	0.047	3.829	0.000	Supported
H10	CTS → CUCC	0.135	0.042	3.228	0.001	Supported
H11	ITR → CUCC	0.060	0.045	1.347	0.089	Not-Supported
H12	TRS → CUCC	0.137	0.039	3.551	0.000	Supported
H13	CPP → CUCC	0.010	0.041	0.238	0.406	Not-Supported
H14	GVS → CUCC	0.223	0.050	4.469	0.000	Supported
H15	CUCC → OGP	0.532	0.040	13.183	0.000	Supported

CMP = Compatibility, CMX= Complexity; CNF= Confirmation, CPP= Competitive pressure, CTS = Cost saving, GVS = Government support, ITR =IT readiness, OGP = Organizational Performance, RLA = Relative advantage, SCP= Security and privacy, STS= Satisfaction, CUCC = Continuance use of cloud computing, TMS= Top management support, TRS= Perceived Trust

Accordingly, the results of path analysis in relation to the above hypotheses (H1-H15) in the structural model are explained as follows:

- Hypothesis1 (H1): Confirmation (CNF) has positive effect on Relative Advantage (RLA) (β=0.485, T-value= 9.217, $p<0.0001$). Thus, H1 is accepted.
- Hypothesis 2 (H2): Confirmation (CNF) has positive effect on Satisfaction (STS) (β=0.406, T-value= 7.066, $p<0.0001$). Thus, H2 is accepted.
- Hypothesis 3 (H3): Satisfaction (STS) has positive effect on Continuance Use of Cloud Computing Adoption (CUCC), (β=0.229, T-value= 4.462, $p<0.0001$). Thus, H3 is accepted.
- Hypothesis 4 (H4): Relative Advantage (RLA) has positive effect on Satisfaction (STS) (β=0.453, T-value= 7.532, $p<0.0001$). Thus, H4 is accepted.
- Hypothesis 5 (H5): Relative Advantage (RLA) has positive effect on Continuance Use of Cloud Computing Adoption (CUCC) (β=0.149, T-value= 3.492, $p<0.0001$). Thus, H5 is accepted.
- Hypothesis 6 (H6): Complexity (CMX) has positive effect on Continuance Use of Cloud Computing Adoption (CUCC) (β=0.046, T-value= 1.373, $p = 0.085$). Thus, H6 is rejected.
- Hypothesis 7 (H7): Compatibility (CMP) has positive effect on Continuance Use of Cloud Computing Adoption (CUCC) (β=0.182, T-value= 4.942, $p<0.0001$). Thus, H7 is accepted.
- Hypothesis 8 (H8): Perceived Security and Privacy (SCP) has positive effect on Continuance Use of Cloud Computing Adoption (CUCC) (β=-0.033, T-value= 0.665, $p = 0.253$). Thus, H8 is rejected.
- Hypothesis 9 (H9): Top Management Support (TMS) has positive effect on Continuance Use of Cloud Computing Adoption (CUCC) (β=0.135, T-value= 3.228, $p<0.0001$). Thus, H9 is accepted.

- Hypothesis 10 (H10): Cost Saving (CTS) has positive effect on Continuance Use of Cloud Computing Adoption (CUCC) (β=-0.137, T-value= 3.551, $p<0.0001$). Thus, H10 is accepted.

- Hypothesis 11 (H11): IT Readiness (ITR) has positive effect on Continuance Use of Cloud Computing Adoption (CUCC) (β=-0.060, T-value= 1.347, $p = 0.089$). Thus, H11 is rejected.

- Hypothesis 12 (H12): Perceived Trust (TRS) has positive effect on Continuance Use of Cloud Computing Adoption (CUCC) (β=-0.137, T-value= 3.551, $p<0.0001$). Thus, H12 is accepted.

- Hypothesis 13 (H13): Competitive Pressure (CPP) has positive effect on Continuance Use of Cloud Computing Adoption (CUCC) (β=-0.010, T-value= 0.238, $p = 0.406$). Thus, H13 is rejected.

- Hypothesis 14 (H14): Government Support (GVS) has positive effect on Continuance Use of Cloud Computing Adoption (CUCC) (β=-0.223, T-value= 4.469, $p<0.0001$). Thus, H14 is accepted.

- Hypothesis 15 (H15): Continuance Use of Cloud Computing Adoption (CUCC) has positive effect on Organizational Performance (OGP) CUCC) (β=-0.532, T-value= 13.183, $p<0.0001$). Thus, H15 is accepted.

6.5 Discussion of the Findings

The main aim of this study was to examine the factors that affect the continuance use of cloud computing services in the organizations and investigate the effect of this use in organizational performance. As shown in Table 6.16, 11 of our hypotheses were supported out of 15. In this section, an in-depth interpretation of the main results along with their link to the extant literature, will be discussed. This section aims to provide interpretations and inferences of analysis results and detailed discussion on these research findings.

6.5.1 The Impact of Confirmation on Relative Advantage and Satisfaction

For the first research hypothesis H1 stating that confirmation will have a positive impact on the relative advantage of cloud computing services(β=0.485, T-value= 9.217, $p<0.0001$). As well, the second research hypothesis H2 stating that, the confirmation will have a positive impact on the SME satisfaction of cloud computing services (β=0.406, T-value= 7.066, $p<0.0001$). The results in Table 6.16 showes that, the first two hypotheses were supported in the proposed model.

The findings revealed that confirmation is a significant determinant of both relative advantage and satisfaction, which in turn positively associated with the continuous use of cloud computing services. Hence, this result is consistent with results reported in the original theory of ISCM (Bhattacherjee, 2001a; Bhattacherjee, 2001b). Besides, these findings are also consistent with prior IS studies (Bøe et al., 2015; Ha, 2006; Hong et al., 2006; Lin et al., 2005).

This means, once SMEs achieved the expected benefit from cloud computing services, they are more likely to confirm its relative advantage. Therefore, cloud computing providers need to meet SMEs` expectation from cloud computing services. When SME obtained benefits from the cloud services, it is expected that the SME will confirm the usefulness of these services, and this lead SME to resubscription cloud computing services.

6.5.2 The Impact of Satisfaction on Continuance Use of Clod Computing Services

Regarding third hypothesis H3 stating that satisfaction will have a positive effect on continuous use of cloud computing services (β=0.229, T-value= 4.462, $p<0.0001$).

As expected, we found a strong relationship between SMEs Satisfaction and continuance use of cloud computing services. SMEs satisfaction was a stronger predictor of cloud computing services continuance use. This confirms the study from of (Bhattacherjee, 2001a; Bhattacherjee, 2001b; Jia et al., 2017; Limayem et al., 2007; Walther & Eymann, 2012).

The result shows that SMEs' satisfaction is an important predictor of continuance use intention towards cloud computing services. This means, once SMEs' become satisfied from cloud services, they are more likely to continue resubscription from the same cloud provider. Therefore, cloud computing providers should build strong satisfaction among SME. They need to offer regularly better services with the most valuable features and to advertise the benefits of cloud services to SMEs through their channels.

6.5.3 The Impact of Relative Advantage on Satisfaction and Continuance Use of Clod Computing Services

Hypotheses H4 and H5 state that relative advantage has a positive effect on SME satisfaction and continuance use of cloud computing services as well. Results of hypotheses 4 (β=0.453, T-value= 7.532, $p<0.0001$) and hypotheses 5 (β=0.149, T-value= 3.492, $p<0.0001$) provided evidence to support these hypotheses.

The relative advantage was defined as the extent to which SME decision-makers consider cloud computing services as a better platform compared to the other traditional systems. The more advantages that SMEs derive from cloud computing services use, the more satisfied they are, and thus, the more likely they are to sustain using them. Malaysian SMEs were found to be positively affected by the perceived relative advantage which provides support for (Benlian et al., 2011; Bhattacherjee, 2001b; Premkumar & Bhattacherjee, 2008; Ramayah et al., 2016). This means that decision-makers in Malaysian SMEs are satisfied with cloud computing services, and they perceive cloud services more useful for their businesses are more probable to continuous use. Hence, it is suggested that the greater the perceived relative advantage of having cloud computing services, the greater the SMEs to continuance use. On the other hand, it could be concluded that if SMEs does not perceive cloud computing services as a better alternative to the traditional IS after they have already used it, it is likely that the implementation would be discontinued.

6.5.4 The Impact of Complexity on Continuance Use of Clod Computing Services

In hypothesis H6, this study investigated the impact of perceived complexity on the continuous use of cloud computing services. This hypothesis was not supported by the results of the current study, with a P-value of 0.085 (exceeded the 0.05 benchmark value) and the T value of 1.373 (less than 1.67 benchmark value), and standardized estimate (β) for the path from complexity to cloud computing continuous use is 0.046. The results revealed that perceived complexity is not a good predictor for the continuous use of cloud computing services in Malaysian SMEs context. This result contradicts with previous studies (Hong et al., 2006; Weng & Tsai, 2015).

In the context of cloud computing adoption, the results of the study by Low et al. (2011) show that the effect of complexity on cloud computing adoption is not supported. The study by Stieninger and Nedbal (2014) revealed that due to simple administration tools, high usability and a high degree of automation of cloud computing, experts do not consider cloud computing to be a very complex technology to implement. This interprets the results of this study, which demonstrate the weak the relationship between the complexity and the continuous use of cloud computing services.

One possible reason for the results of the insignificant relationship between perceived complexity and cloud computing continuation use is due to SMEs decision-makers' characteristics whos are already adopters of cloud services in their firm's activities, and they have enough experience. Another possible reason to explain the unsupported relationship is that perceived complexity may have been narrowly operationalized in this study. For example, only five items manageability, easy integration, the safety of computers and data, easy to learn, and the degree of skill were included in the survey scale to measure complexity. Perceptions of other dimensions such as the amount of mental effort required to use cloud services, and the degree of cloud services complexity for business operations and employees of the firm. Additionally, the items of perceived complexity were revised changed from negative to positive questions, as suggested by reviewer experts. May this lead to misunderstanding by the respondents.

6.5.5 The Impact of Compatibility on Continuance Use of Clod Computing Services

In testing hypothesis H7 related to the impact of compatibility on continuous use of cloud computing services, the results pointed out that, continuous use of cloud computing services is positively affected by compatibility construct ($\beta=0.182$, T-value= 4.942, $p<0.0001$).

Previous researches (Cheng & Bounfour, 2015; Lian et al., 2014; Low et al., 2011; Oliveira et al., 2014), have highlighted compatibility as one of the significant characteristics of cloud computing services. However, other researchers confirmed the finding of this research, that there is no direct relationship between perceived usefulness and continuance intention (Ramayah et al., 2016). According to Moore and Benbasat (1991), and Rogers (2003), compatibility refers to which extent the value of an innovation is consistent with the existing beliefs, values, and needs of the potential adopter. From the perspective of SMEs decision-makers in Malaysia, cloud computing services are compatible with the systems that are already in use and with the way the SMEs usually performs. In addition, using cloud computing services does not require any technical changes, and can easily be integrated into existing IT infrastructure.

6.5.6 The Impact of Perceived Security and Privacy on Continuance Use of Clod Computing Services

Hypothesis H8 illustrates the effect of perceived security and privacy on the continuance use of cloud computing services. The result of this research demonstrated that, perceived security and privacy did not have a significant influence on the Malaysian SMEs decision-makers to continuance use cloud computing services, (β=-0.033, T-value= 0.665, p = 0.253). The positive effect of perceived security and privacy on continuance intention was supported by previous researchers (Chan & Chong, 2013; Park et al., 2016; Wang, 2011). However, other researchers confirmed the finding of this research, that there is no direct relationship between perceived security and privacy and continuance use. The results of the current study are consistent with other researchers, such as (Ramayah et al., 2016).

Most of IT initiatives issues will normally be encountered at the very beginning of the adoption stage. Therefore, SMEs decision-makers security and privacy concerns have faded after the actual use of cloud computing services since they are already implemented in their firms, and they have enough experience. The finding may also be caused by the fact that Malaysian SMEs are still not clear or aware of the potential threats and security issues of establishing their business online via cloud computing. Another potential explanation of this result is that it may be partly due to the low-level cloud computing services adopters are not involved in the financial transactions or sensitive data.

6.5.7 The Impact of Top Management Support on Continuance Use of Clod Computing Services

H 9 states that top management support has a positive effect on the continuous use of cloud computing services. The research findings in this study supported this hypothesis (β=0.182, T-value= 3.829, p<0.0001) and restated the positive influence of top management support on the continuous use of cloud computing services. In addition, these results are also consistent with the extant IS studies which pointed out that the continuous use of IT innovations were found to depend on top management's vision and commitment are necessary for fostering technological use such as (Alshamaila, Savvas Papagiannidis, et al., 2013; Ramayah et al., 2016; Rezvani et al., 2017). The result of the current study is in line with the above studies indicate that top management support plays a critical role in the SMEs continuous use of cloud computing services in order to facilitate cloud computing services adoption and to overcome users' or employees' resistance to change brought usage by cloud computing services.

6.5.8 The Impact of Cost-Saving on The Continuance Use of Cloud Computing Services

In testing H 10 related to the relationship between cost-saving and the continues use of cloud computing services. The results pointed out that cost saving has a significant positive influence on the continues use of cloud computing services among Malasian SMEs (β=-0.135, T-value= 3.228, p<0.0001). This result corresponds to the previous IS studies which triggered out that cost saving of IT innovations use has a significant effect on the adoption and continuance use (Alismaili, Li, et al., 2016a; Chen et al., 2018; Martins et al., 2019; Yeboah-Boateng & Essandoh, 2014).

Cost-saving is one of the main reasons that organizations switch to cloud computing services because cloud computing services can cut the cost of building an organizations' system (Fernández et al., 2014). Cost-saving plays an important role in sustaining usage of cloud computing services in organizations. Cost is an important predictor in Malaysian SMEs to use cloud computing services in their activities. If the usage of cloud computing services will lead to reducing the operational cost, SMEs' continuance use tends to be hight.

6.5.9 The Impact of IT Readiness on The Continuance Use of Cloud Computing Services

In this study, IT readiness was operationally defined as the level to which technology infrastructure, relevant systems, IT human resources, and technical business skills can reinforce the continuous use of cloud computing services. H 11 is related to the effect of IT readiness on the continuance use of cloud computing services. Despite the importance of IT Readiness for the organizations to adopt and use cloud computing services, it has been found to be of less importance in the case of Malaysian SMEs. However, the results of the empirical investigation show that IT readiness has no effect on the continuance use of cloud computing services (β=-0.060, T-value= 1.347, $p = 0.089$). This means that this study not supported the existence of any relationship between IT readiness and continuance use of cloud computing services in the Malaysian context. These results are in contradicts with the literature of IS studies. Previous studies in IS usually support the positive relationship between IT Readiness and IT innovations adoption and use including cloud computing services (Alkhater et al., 2018; Alshamaila, Papagiannidis, et al., 2013; Gupta et al., 2013; Oliveira & Martins, 2010). It was quite surprising as we believed that with greater IT readiness, the degree of continuous use of cloud computing services would enlarge. In this case, SMEs are tempted to continuous use of cloud computing services even without having a dependency on decision-makers IT knowledge or IT readiness .

6.5.10 The Impact of Perceived Trust on The Continuance Use of Cloud Computing Services

H12 states that perceived trust has a positive impact on the continuance use of cloud computing services. Result of testing this hypothesis confirmed the positive effect of perceived trust on the continuance use of cloud computing services β=-0.137, T-value= 3.551, $p<0.0001$). Thus, H12 is accepted. Trust is one of the organizational factors that affect Malaysian SMEs to continuance use of cloud computing services. This finding is consistent with a former study (Alkhater et al., 2018). Alkhater et al. (2018) found that perceived trust will positively affect an organization's intention to adopt cloud computing services. Trust is vital for the relationship between cloud computing service providers and their clients; it plays a critical role in deciding the continuous use of cloud computing service in the organizations because it reduces uncertainty (Akter et al., 2013; Yoo &

Kim, 2018). The findings of this study mean that trust is among the factors that drive the continuance use of cloud computing services. Thus, trust needs to exist between all parties to increase the continuance use of cloud computing services.

6.5.11 The Impact of Competitive Pressure on The Continuance Use of Cloud Computing Services

This research also examined the effect of competitive pressure on the continuance use of cloud computing services in H 13. However, the results of the empirical investigation show that competitive pressure has no effect o the continuance use of cloud computing services the context of Malaysian SMEs (β=-0.010, T-value= 0.238, p = 0.406). The results of this hypothesis mean that competitive pressures will not force Malaysian cloud computing services SMEs to continuance use.

The result of this study is inconsistent with some previous studies which report there is a significant positive influence of competitive pressure in adoption and use of IT innovation (e.g., (Doolin & Troshani, 2007; Oliveira & Martins, 2010)). This finding, however, is in line with the study of (Ramayah et al., 2016) external pressure was found not to be significant for SMEs to a continuance to adopt a website in Malaysia. are not inappropriate interval confidence.

6.5.12 The Impact of Government Support on The Continuance Use of Cloud Computing Services

Government support is the second environmental factor examined in this study. H 14 states that Government support has a positive impact on the continuance use of cloud computing services. This hypothesis was supported by the empirical evidence, which showed a strong impact of government support on the continuance use of cloud computing services (β=-0.223, T-value= 4.469, p<0.0001). This finding is in accord with the findings of prior research, which predominately view government support as a major predictor that has a great role in IT innovation adoption and use including cloud computing services (e,g, (Jia et al., 2017; Mohtaramzadeh et al., 2018; Oliveira et al., 2014; Saedi & Iahad, 2013a; Scupola, 2003)) This result is interpreted due to the incentives provided by the Malaysian government through MSC Malaysia Cloud Initiative organized by Malaysia Digital Economy Corporation (MDEC) to encourage SMEs to adopt and continuous use of cloud computing services**.**

6.5.13 The Impact Continuance Use of Cloud Computing Services on SMEs Organizational Performance

There has been limited research on the effect of cloud computing services on SMEs organizational performance. Therefore, in order to fill this research gap, the present study focused on the Malaysian context, to examine the continuance use of cloud computing services effect on the SMEs organizational performance. In examining the last hypothesis (H15) in this study, the findings indicated that continuous use of cloud computing services has a positive effect on SMEs organizational performance (β=-0.532, T-value= 13.183, $p<0.0001$). Furthermore, the coefficient of determination (R^2 value) shown that the continuous use of cloud computing services explains or interprets 28.1% of SMEs organizational performance (refer to Table 6.13).

The findings of the present study revealed a positive relationship between the continuous use of cloud computing services and SMEs organizational performance. These results are in agreement with the previous IS studies (Gunasekaran et al., 2017; Masli et al., 2011; Pinho & Ferreira, 2017) In addition, findings from this research is consistent with results presented by prior studied (Şahİn & Topal, 2018; Wamba et al., 2017) where the authors claimed that the IT adoption and use plays a positive role in organization's performance. Besides, findings from this study are analogous with results from (Wamba et al., 2017) where the authors emphasized that there exist direct and positive effects of big data analytics on the performance of 297 Chinese firms. Moreover, findings from this study are consistent with results presented by (Şahİn & Topal, 2018) where the researchers stated that intensive use of IT has a positive effect on business performance in Turkey.

Hitherto, there is hardly any research conducted into the effect of continuous use of cloud computing services on SMEs organizational performance. Thus, it can be concluded that the continuous use of cloud computing services is a key determinant that should be considered by SMEs in Malaysia in order to promote and enhance their organizational performance. In other words, this implicates that the organizational performance of SMEs in Malaysia will by promoted by continuous use of cloud computing services in their enterprise operations.

6.6 Final Model

As shown in Figure 6.4, the final model of this study after deleting the non-significant relationship. The results of hypothesis testing showed that are confirmation, satisfaction, relative advantage, compatibility, top management support, cost-saving, trust and government support, with path of 0.485, 0.406, 0.229, 0.453, 0.149, 0.182, 0.182, 0.135, 0.137, and 0.223, respectively explain 77.6% of the variance in continuance use of cloud computing services. The hypotheses (H1; H2; H3; H4; H5; H7; H9; H10; H12; H14) were supported .Furthermore, it was found that continuance use of cloud computing services explains 28.3% of the variance in SMEs performance. The path had positive effects, with the beta coefficient value 0.532, which means that hypotheses H15 was supported.

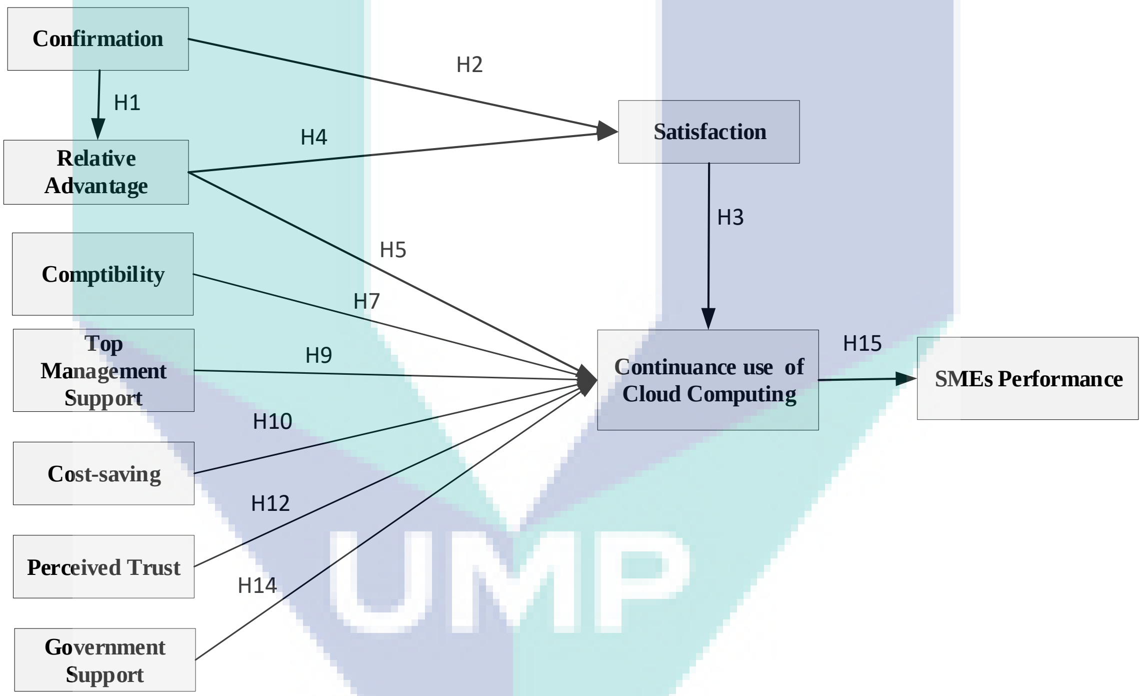

Figure 6.3 Final Research Model

6.7 Final Model Verification

This section discusses the results of the verification process for the developed model using two case studies. The verification process aims to gain information as to answer the last research question and to evaluate the applicability and usability of the model proposed in the current research in the context of Malaysian SMEs. Such findings reflect the respondents' opinions, thoughts, and perceptions of the applicability of technological, organizational, and environmental factors in the continuance use of cloud computing services. They also allow for generating in-depth information and a better understanding of the effect of continuance use of cloud computing services in the SMEs' organizational performance.

As stated in the Chapter 3 methodology, the present study adopted case study strategy to investigate a contemporary phenomenon in its real-life context empirically. Due to the interactive nature of the case studies, the researcher could obtain further insights from the respondents into each factor. Case study design could assist in studying the usage of cloud computing services in the context of Malaysian SME and in achieving the last research objective.

The case studies carried out in the current research by employed a semi-structured group interview as the primary data collection method. The researcher conducted the semi-structured group interview with five decision-makers at different levels of management in two Malaysian SMEs to elicit more information about their' perceptions and experience in cloud computing usage. They were selected for the interviews because they are highly experienced at cloud computing services usage from both the technical and business perspective, and all of them had been involved in the cloud computing services decision-making process at their organizations. The number of interviewees was restricted to three for the first case study and two for the second case study due to the constraints of information access and contact, including setting up appointments, time, and confidentiality issues. The main aim of carrying out the semi-structured group interview has two-fold. Firstly, to evaluate the applicability and usability of the developed model by investigating how this model could be implemented in the SME sector as well as to examine how the cloud computing services usage within those SMEs could enhance their organizational performance.

The first case study was conducted with an international school located in Putrajaya Malaysia named "The International Modern Arabic School." In this research, the first case study will be referred to as IMAS. IMAS was initiated in 2007 and categorized as a medium-size enterprise with 174 full-time employees with annual revenue of around 20 million Malaysian Ringgit. IMAS is a co-educational institution established in Kuala Lumpur and adopted cloud-based ERP-systems since 2014. IMAS offers Kindergarten, primary, secondary, and pre-university education. This school provides different services to its students, such as education, transportation, meals, and the library for reading books. IMAS has utilized cloud computing services since 2014 by moving some of its on-premise software to ERP-based cloud computing such as invoicing and payment system and human resource management. Furthermore, IMAS used Google classroom as a learning management system for teaching.

The second case study was conducted with a travel agency named "Almohit Travel and Tours Company" located in Kuala Lumpur, Malaysia. In this research, the second case study will be referred to as MTT. MTT was established in 2009 and classified as small-size enterprise s with 30 full-time employees with annual revenue of around 300,000 Malaysian Ringgit. The company provides different services to its customers such as tourist programs, hotels reservations, transportation, airport pickup, consultation to tourists in terms of what they should and should not do when visiting Malaysia, what are the best places to visit, what are the best foods or restaurants in the region, etc. MTT utilized software-as-a-service (SaaS) solution to support their business practices in terms of contact with their customers (CRM) collaborate with their agents' employee across different offices (HRMS).

The respondents from the participated SMEs were varied in their positions (2 CEOs, 1 finance Manager, 1head of IT department and 1 operations manager) and came from different educational backgrounds (2 Ph.D. holders, 2 Master degree and 1 Bachelor in Communication Eng.) with more than 10 years of experiences as illustrated in Table 6.17.

Table 6.17 Interviewees' profile

Code	Position	Education Background	Experience (year)	Case Study
IMAS1	Principle of School	Ph.D. (Management)	15 yrs.	IMAS
IMAS2	Finance Manager	Master (Accountant)	20 yrs.	IMAS
IMAS3	Head of IT Department	Ph.D. (Computer Science)	15 yrs.	IMAS
MTT1	CEO	MBA	20 yrs.	MTT
MTT2	Operations Manager	Bachelor (Communication Eng.)	15 yrs.	MTT

A semi-structured group interview was developed to verify the developed model in this study and to enrich the existing data obtained from the questionnaire and the literature. The semi-structured group interview questions were divided into four main sections, as shown in (Appendix J). The first section of the semi-structured group interview document contains the letter from the researcher to the participants ended by a consent form. For each interview, we obtained written informed consent to participate. The second section of the semi-structured interview document includes a description of the process of model development, the need, and the aim of developing the model and results of model testing with the final model.

The third section of the interview document contains three parts. Thus, the interviewees were asked about the information background about the participated SMEs in the first part. The first part of the interview document is an open-ended question about the SMEs' context. This part contains a set of introductory questions designed primarily to collect fundamental data and information about respondents and their organizations. The collected data from this part includes information gathered about the participated SME as a case study including the number of employees, SME sector, annual revenue, the establishment date of SME, the period of cloud computing services usage, payment option and the IT Services and Applications that moved to cloud computing services in the organization. These questions assist us in establishing the background and experience of the respondent and the organization s/he works at as well as to make the respondent feel comfortable with the interview situation. The second part of the semi-structured interview document includes two open-ended questions about the model comprehensiveness and validity and how can we apply this model in the SME sector. The third part asked the interviewees to evaluate the cloud computing services' impact on their SME' organizational performance. The organizational performance was measured based on the subjective measurement, including sales growth, profitability, cuts down the operational costs, market share, financial performance, productivity, client satisfaction, competitive advantage, and accurate data that can be provided by cloud computing services. A five-point Likert scale is utilized to measure this part.

The last section contains an open-ended question to give any comments or recommendations and information on the interviewee, including name, position, organization, profession, and the number of years' experience. To ensure reliability and validity, the interview document has been reviewed by two experts in qualitative methods who have a PhD in the information system.

The semi-structured group interview was between 60 to 90 minutes in duration and the first half-hour was a presentation to explain the research and its objectives, the model development process, the benefits of the model to SMEs, the operational definition for the factors in the final integrated model. The results of the validation were discussed with the interviewees to ensure that they reflect the situation in their SMEs and to finalize the interview.

During each interview, a short memo was written to capture interview interactions, impressions, and observations' impact. Later the interview's transcript was arranged in a matrix table and summarized into key points to perform coding, and categorize the answers based on the interview questions.

Question 1: In your opinion, to what extent this model is comprehensive and valid for cloud computing services continuance use?

The first question in the third section of the semi-structured group interview was about to what extent this model is comprehensive and valid for cloud computing services continuance use. The main purpose of this question is to acquire the opinion of SMEs decision-makers on the comprehensive and verification of the final model that has been validated in the last stage of this study.

The findings show that all the Interviewees agree that the proposed model is comprehensive, essential, and play a significant role in the continuous use behavior of SMEs in the context of cloud computing services. For example, IMAS1 stated that:

> "*I see in your model some important factors that encourage companies to continuances the use of cloud computing services.*"

Another participant from the second case study confirmed the above-mentioned point and added a further explanation of the integrated model as it includes different dimensions that are critical to addressing the continuous use of cloud computing services from a comprehensive viewpoint. As stated by MTT2:

"the integrated model is a nice one as it covers three main categories (technological, organizational and environmental) for predicting the factors that affect SME to continues use of cloud computing"

All the participants in this interview agree that the continuance use of cloud computing services has a positive influence on the organizational performance of their SMEs. This was mentioned by IMAS3:

"Cloud-Based ERP system usage in our school reduced the costs of and IT infrastructure and the IT department employees as well as eliminated the paperwork and facilitated paperless administration, saving the precious time and resources."

This is in line with what was pointed out by MTT1:

"I can assure you that the cloud computing services used in our company enhanced the customer's satisfaction, cut the operational costs and improved the overall performance."

In addition, the participant in the semi-structured interview demonstrated that the listed factors on the integrated model contribute significantly to increase the desire for SMEs to continuance use of cloud computing services, which in turn, improves the organizational performance. This perspective was affirmed by IMAS2:

"I think that these factors listed in your model have a considerable influence on any company to adopt and continuance use cloud computing services. Ultimately, this will improve organizational performance.".

Question 2: In your opinion, how can this model be applied in the SME sector?

In this question, we asked the interviewees to evaluate the factors that affect their decision to continuance use of cloud computing. This open-ended question was framed based on the fourth research objective and the continence use factors of cloud computing services discovered from the integrated model. Before answering this question, the operational definition of the factors has been explained to the interviewees. These results of the semi-structured group interview emphasize the results of the structural model assessment (Section 6.4.2) and the earlier studies as discussed in (Section 6.4.3), demonstrated that the factors were chosen from the final integrated model are important factors, and they will predict the continuous use of cloud computing services in the context of SMEs. The evaluated factors are satisfaction, confirmation, relative advantage, compatibility, top management support, cost-saving, perceived trust and government support.

Relative Advantage

All the participants in the interview stressed that the relative advantage is among the most critical factors that have a major effect on the SME decision-makers to the continuous use of cloud computing services. IMAS1 stated that:

"The main advantage provided when we migrated to cloud computing services is a good online learning environment for students, and created a better working environment for staff and teachers"

Likewise, IMAS2 stated that:

"Cloud computing services eliminate the need for expensive hardware and the costs associated with paper. Also, cloud computing services offered more collaboration between teachers, learners, and staff with easy accessibility and mobility."

Furthermore, IMAS3 implied that:

"cloud computing services solutions have given the school a wide range of opportunities and advantages."

Similarly, MTT1said:

"Cloud computing services improved our business and make it more successful. There are many benefits and opportunities that have been added to our business when we moved to cloud computing services."

Finally, MTT2 said:

"Cloud computing services get more works done in less time with fewer employees. Cloud computing increased or productivity with reducing the cost".

Compatibility

The interviewees emphasized that cloud computing services are consistent with the SMEs' business model and existing on-premise software and hardware encouraged them to continue use of cloud computing services. IMAS2 said:

"In our school, the cloud computing services usage provides us with an opportunity to introduce modifications to the system so that it be in line with our needs. When we moved to the cloud, we had no difficulties and our business was stable"

Furthermore, MTT2 mentioned that:

"the cloud computing services usage is fit with our business model and it was very easy to transform our local data to the cloud."

Satisfaction

The majority of the respondents agreed that satisfaction is an important factor influencing their intention to continuous use of cloud computing services. IMAS3 mentioned that:

"We are satisfied with cloud computing services (e.g., enable us to accomplish tasks more quickly, information accessibility 24/7, remotely administer IT resources.)"

Similarly, MMT2 mentioned that:

"Our experience of using cloud computing services is very satisfied and pleasing."

Top Management Support

As decision-makers, all the participants in the semi-structured group interview had a positive point of view regarding the continuous use of cloud computing services in their organizations. According to IMSA1:

"We always eager to adopt and utilize new innovations in our school such as cloud computing services to improve the teaching and learning process and keep abreast of the latest technologies."

In the same way, MTT1 stressed:

" We are using innovative technologies in our company to enhance our competitive position and keep pace with IT development to improve organizational performance. To harness technological advances as a competitive advantage, the decision-makers must constantly seek to utilize newer technologies such as cloud computing services."

Cost-Saving

Cost-Saving was observed to be noteworthy factors for anticipating cloud computing services' continuous use. The participants in the interview emphasize that one of the main reasons that their SMEs migrated to cloud computing services is the affordable price to rent IT infrastructures and the pay-as-you-go pricing model. As IMAS2 said:

"cloud computing services helped us in our school to pay only for what we used, rather than buying hardware or software up front or paying a preset annual subscription fee".

Likewise, MTT1 stated that:

"cloud computing services eliminate the cost of upgrading the system and maintenance. The overall cost of using cloud computing services is less than the

cost of installing or developing on-premise software."

Perceived Trust

The majority of the respondents emphasize that perceived trust is vital for the relationship between them and cloud computing service providers. Trust plays a critical role in deciding the continuous use of cloud computing services in SMEs because it reduces uncertainty. As IMAS2 stated that:

"Our data and IT resources are critical if we do not trust the cloud computing services, we will not move our business to"

Likely MTT1 said:

"If the innovations and technology are not trustworthy, we will stop using this technology. Trust is the key ingredient to keep the individuals and organizations using any new technology including cloud computing services. In our company, if we can't trust the cloud computing services, it is better to depend on on-premise software or find other technology"

Government Support

The availability of government support is also an important factor impacting on the SMEs' decision-makers to continuous use of cloud computing services. In this Semi-structured group interview, most of the interviewees mentioned that SMEs need government support, especially those who have limited access to financial resources. IMAS1 stated that:

"Of course, we need government support through providing the necessary support such as instituting relevant laws, adopting IT infrastructure including high internet bandwidth with a reasonable subscription fee to individuals and SME owners, all this can encourage the use of cloud computing services."

Likewise, MTT1 stated:

> *"I believe that government support and clear terms and conditions will strongly motivate SMEs to use cloud computing services."*

In addition to the open-ended question about the participant's opinions on how the integrated model can be applied in the SME sector, the researcher has designed a survey contained close-ended questions to verify the applicability of the integrated model in SMEs. The closed-ended questions include the revised items of the distributed survey for the final model factors. The online survey questionnaire was developed using Google document form, and the link distributed to the five participants from two case studies. Five-point Likert scales ranged from 5 (strongly agree) to 1 (strongly disagree) were used to measure the participants' beliefs and intentions towards cloud computing services' continuous use in their companies. The online survey distributed to the participants is presented in Appendix K.

The first section in the online survey was a question about the company agrees to continue using cloud computing services and was measured using a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The main purpose of this question is to capture the participants' intentions as decision-makers to continue using cloud computing services in their companies. Table 6.18 illustrates the five participants' answers to the first question.

Table 6.18 The mean of first question

General Question	**IMAS1**	**IMAS2**	**IMAS3**	**IMAS Mean**	**MTT1**	**MTT2**	**MTT Mean**	**Overall Mean**
Do your company agree to continue using cloud computing services?	5	5	5	5	4	5	4.5	4.80

Rating scale: 1-strongly Disagree 2-Disagree, 3- Neither agree nor disagree, 4-Agree, 5-Strongly Agree

The results of the first question indicated that the answer of the three participants from IMAS is "strongly agree" to continue using cloud computing services and the mean is 5. In Addition, the results revealed that MTT1 agreed to continue using cloud computing services and MTT2 answer with "strongly agree" and the mean of MTT is 4.5. The overall mean score for decision-makers in both participated companies is 4.80. This clearly shows that the agrees level of companies' to continue using cloud computing services is at a very high level.

The second section of the distributed online survey contains 45 close-ended questions adopted and revised from the actual final questionnaire for the supported factors in the final model (refer to section 6.6 and Appendix A) and measured using a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).. The main purpose of this question is to verify the applicability of the integrated model in SMEs based on the participants' knowledge of the nine factors of the model that have been identified in the early stage of this study. Table 6.19 presents the results from the five decision-makers in the two case studies.

Table 6.19 shows that there is a high agreement among the five decision-makers to continue using cloud computing services in their companies. Generally, all model factors received the highest mean scores 4.02. As can be shown in Table 6.19, the results show that the mean value for IMAS ranged from 3.47 for "Trust" construct and 4.33 for "Relative Advantage". Similarly, the results show that the mean value for MTT ranged from 3.67 for the "Compatibility" construct and 4.63 for the "Satisfaction" construct. Generally, the overall mean for all factors in both companies ranged from 3.56 for "Trust and Government Support" constructs to 4.40 for "Continuance Use and Satisfaction" constructs. Overall, the results show that the mean value for seven constructs (relative advantage, compatibility, top management support, cost-saving, continuance use, confirmation, and satisfaction) is 4.02 for the two companies, which means the intention to cloud computing services continue use is high.

As it is seen from Tables 6.18 and 6.19 the results show that all five decision-makers agree that the model factors are important and play a significant role in the continued using cloud computing services in their companies. Regarding this, the mean value of the participants' answers from the first company IMAS1, IMAS2, and, IMAS3 are 4.11, 4.24, and 3.51 respectively with the overall mean 3.95 for the first company. Comparing these results to the same company answer' of the first question "Do your company agree to continue using cloud computing services?", the answer of the three participants from IMAS is "strongly agree" to continue using cloud computing services and the mean is 5. For that, the applicability and usability of the final model in IMAS is 3.95 out of 5. Although the output of the model for IMAS (3,95) is a bit different compared to the perceived value of respondents (5), but almost similar in the context of agreement of continuing usage of cloud computing services.

Furthermore, the mean value of the participants' answers from the second company MTT1and MTT2 is4.17 and 4.04 respectively with the overall mean 4.11 for the second company. Comparing these results to the same company answer' of the first question "Do your company agree to continue using cloud computing services?", the answer of the two participants from MTT is "agree" and "strongly agree" to continue using cloud computing services and the mean is 4.5. For that, the applicability and usability of the final model in MTT is 4.11 out of 4.5. For that, the output of the model for MTT (4.11) is almost the same as the perceived value of respondents (4.5) for the context of agreement of continuing usage of cloud computing services. Thus, the results of the second question aligned with the results of the first question in the distributed online survey.

In sum, the results provide support for the final model to predict the continuance use of cloud computing services in SMEs. These results emphasize the hypotheses testing results as discussed in sections 6.4.3 and 6.5, which demonstrated that the factors that affect the continuance use of cloud computing services in the organizations as concluded in the final model are confirmed and verified in this stage of the research.

Table 6.19 The mean of interviewees' answer to the 45 close-ended questions

Constructs	Items	IMAS1	IMAS2	IMAS3	IMAS Mean (Items)	IMAS Mean (Factors)	MTT1	MTT2	MTT Mean	MTT Mean (Factors)	Items Mean	Overall Mean (Factors)	Overall Mean (Model)
Relative Advantage	RA1	4	4	4	4.00	4.33	4	5	4.5	4.40	4.2	4.36	4.02
	RA2	5	5	4	4.67		4	5	4.5		4.6		
	RA3	4	5	4	4.33		4	5	4.5		4.4		
	RA4	5	5	4	4.67		4	5	4.5		4.6		
	RA5	4	4	4	4.00		4	4	4		4		
Compatibility	CMP1	3	5	3	3.67	3.78	3	4	3.5	3.67	3.6	3.73	
	CMP2	4	5	3	4.00		4	3	3.5		3.8		
	CMP3	4	5	3	4.00		3	4	3.5		3.8		
	CMP4	4	5	3	4.00		3	5	4		4		
	CMP5	3	4	3	3.33		4	3	3.5		3.4		
	CMP6	4	4	3	3.67		4	4	4		3.8		
Top Management Support	TMS1	5	5	3	4.33	4.00	5	4	4.5	4.40	4.4	4.16	
	TMS2	4	5	3	4.00		5	4	4.5		4.2		
	TMS3	4	4	3	3.67		5	4	4.5		4		
	TMS4	5	4	4	4.33		4	4	4		4.2		
	TMS5	4	4	3	3.67		5	4	4.5		4		
Cost Saving	CTS1	4	4	4	4.00	4.00	4	4	4	4.00	4	4	
	CTS2	4	4	3	3.67		4	4	4		3.8		
	CTS3	3	5	4	4.00		4	4	4		4		
	CTS4	3	5	4	4.00		4	4	4		4		
	CTS5	4	5	4	4.33		4	4	4		4.2		
Trust	TRS1	4	4	3	3.67	3.47	4	4	4	3.70	3.8	3.56	
	TRS2	4	3	3	3.33		3	4	3.5		3.4		
	TRS3	4	3	3	3.33		4	4	4		3.6		
	TRS4	4	4	3	3.67		3	4	3.5		3.6		
	TRS5	4	3	3	3.33		4	3	3.5		3.4		

Table 6.19 Continued

Constructs	Items	IMAS1	IMAS2	IMAS3	IMAS Mean (Items)	IMAS Mean (Factors)	MTT1	MTT2	MTT Mean	MTT Mean (Factors)	Items Mean	Overall Mean (Factors)	Overall Mean (Model)
Government Support	GVS1	3	3	3	3.00	3.53	3	3	3	3.60	3	3.56	4.02
	GVS2	4	4	3	3.67		4	4	4		3.8		
	GVS3	4	5	3	4.00		3	4	3.5		3.8		
	GVS4	4	4	3	3.67		4	4	4		3.8		
	GVS5	3	4	3	3.33		4	3	3.5		3.4		
Continuance Use	CUCC1	5	5	3	4.33	4.28	4	4	4	4.58	4.2	4.40	
	CUCC2	4	4	4	4.00		5	5	5		4.4		
	CUCC3	5	4	4	4.33		5	5	5		4.6		
	CUCC4	4	4	4	4.00		5	4	4.5		4.2		
	CUCC5	5	5	4	4.67		5	4	4.5		4.6		
	CUCC6	5	4	4	4.33		5	4	4.5		4.4		
Confirmation	CNF1	4	4	4	4.00	4.00	4	4	4	4.13	4	4.05	
	CNF2	4	4	4	4.00		4	3	3.5		3.8		
	CNF3	4	4	4	4.00		5	4	4.5		4.2		
	CNF4	4	4	4	4.00		5	4	4.5		4.2		
Satisfaction	STS1	4	4	4	4.00	4.25	5	4	4.5	4.63	4.2	4.40	
	STS2	5	4	4	4.33		5	4	4.5		4.4		
	STS3	5	4	4	4.33		5	4	4.5		4.4		
	STS4	5	4	4	4.33		5	5	5		4.6		
Overall mean		4.11	4.24	3.51	3.96		4.18	4.04	4.11				

Question 3: How the use of cloud computing services impact organizational performance of your SME?

Towards the end of the semi-structured group interview, interviewees were invited to answer the last part of section C in the interview document, which has included closed-ended questions. Based on insights from the interviewees, this question examines the effect of cloud computing services' continuous use on their SMEs' organizational performance. The participants in the interview were asked to answer the last question on the interview document based on their knowledge and experience about the change occurred on the organizational performance after they used cloud computing services. The questions of this part were framed based on the last questions in the questionnaire (Appendix A & B). In total, this part includes eight questions with a 5-Likert scale ranging from 1 (Very Low), 2 (Below Average), 3 (Average), 4 (Above Average),and 5 (Very High). The questions in this part were about the effect of cloud computing services' continuous use on the SMEs' financial and non-financial performance including sales growth, profitability, reduce the operating costs, market share, productivity, customer satisfaction, competitive advantage, and accurate data. The focus of these questions is to find out the impact of cloud computing continued use on SMEs' organizational performance. The answers of the interviewees from two case studies are showing in Table 6.20.

The results demonstrations that all the respondents indicated that there are positive effects of the use of cloud computing services in their SMEs' organizational performance. Respondents' responses ranged between "Very high," and "Above average" for the first question with overall mean 4.2 regarding the effect of cloud computing continued use on their SMEs sales growth with mean score 4.0 for IMAS.and 4.5 for MTT. Regarding the effect cloud computing continuous use on the profitability of SMEs, indicated that the effect is "average", for IMAS and MTT with mean 3.3 and 3.5 respectively with overall mean 3.4. All the respondents' agreed that there is a "Very high" effect of cloud computing continuous use on the reduction of operating costs with mean 5 for MAS and 4.5 for MTT and overall mean 4.8. Furthermore, respondents' responses to the interview confirmed that the continuous use of cloud computing services contributed to the growth of their market share, average effect, and overall mean 3.4 for all participated companies.

Besides that, findings showed that the continuous use of cloud computing services has a high effect on SMEs' productivity. Thus, 3 out of the interviewees confirmed the very high effectiveness, and the other two interviewees confirmed the "Above Average" effect on productivity with mean 5 and 4.6 for IMAS and MTT respectively.

There is an "Above Average" effect for the cloud computing services' continuous use on the clients' satisfaction based on the answers of all the interviewees to the sixth question with mean 4 for bith companies. The effect of cloud computing services' continuous use on the SMEs' competitive advantage is ranged between "Above average" and "Average" based on the perspectives of the five interviewees with overall mean 3.6. Finally, all respondents had the same visions "Very High effect" on the data accuracy that will be provided when they will continuously use cloud computing services with overall mean 5.

Therefore, the findings from the semi-structured group interview support the main results of the current study and affirmed that the developed model is verified and evaluated the applicability in the Malaysian SME sectors.

Table 6.20 Interviewees' answer to the effect of cloud computing continued use on organizational performance

Indicator / Effect	IMAS1	IMAS2	IMAS3	IMAS Mean	MTT1	MTT2	MTT Mean	Overall Mean
Sales growth	4	4	4	4.00	4	5	4.5	4.2
Profitability	4	3	3	3.33	3	4	3.5	3.4
Reduce the operating costs	5	5	5	5.00	4	5	4.5	4.8
Market share	4	3	4	3.67	3	3	3	3.4
Productivity	5	5	5	5.00	4	4	4	4.6
Clients satisfaction	4	4	4	4.00	4	4	4	4
Competitive advantage	4	4	3	3.67	4	3	3.5	3.6
Accurate data	5	5	5	5.00	5	5	5	5
Overall mean of respondents	4.38	4.13	4.13	4.21	3.88	4.13	4.00	

Degree of effect: Very High = 5; Above Average= 4; Average = 3; Below Average=2; Very Low= 1

6.8 Chapter Summary

This chapter presented the validation results of the measurement and structural model through a quantitative analysis of the survey conducted among 415 SMEs utilized cloud computing services and located in Malaysia. Before model validation, some processes were undertaken on the collected data. The data was edited, coded, and entered in a table format to treat the missing values. Besides, to ensure reliable results, the data were examined against some analysis requirements criteria, such as the adequacy of the sample, check the normality of data distribution, and remove outliers. As a result of this process, 38 responses were dropped due to multivariate outliers.

Then, to validate the developed integrated model by examining the relationships between the factors in the developed model. The PLS-SEM approach has been used to evaluate the developed model through a two-step approach. The first one related to the assessment of the outer measurement model, whereas the second one concerned with the assessment of the inner structural model. In terms of the measurement model assessment, the empirical results indicated that the measurement model was established, and this has led us to proceed with the evaluation of the structural model. In terms of the structural model assessment, four measures were used to assess the structural model including hypotheses testing through path coefficient, the level of R2 values, the f2 effect size, and the predictive relevance Q2. Table 6.16 shows the summarized hypotheses testing findings. It can be seen that 11 out of 15 formulated hypotheses were supported. In short, the results of this chapter achieved the third objective of this study. Next, this chapter provided a discussion of the findings based on the PLS-SEM analysis. The interpretations of the findings were carried out to support the hypotheses.

Finally, the last part of the chapter discussed the verification process for the researh final model and the findings obtained from the semi-structured group interview to answer the last research question and to evaluate the applicability and usability of the model proposed in the current research in the context of Malaysian SMEs. The next chapter concludes all these findings with the aims to re-examine each research objective, to justify the contributions and implications, to recommend the possible future research, and to identify limitations of this research.

CHAPTER 7

CONCLUSION, IMPLICATIONS AND FUTURE RESEARCH

7.1 Introduction

In this chapter, the overall summary of the research achievements, along with their relationship to the research objectives were discussed. The final research model was also presented. The significant contributions of this study to the theory, research and practice were addressed. Finally, the study limitations and directions for future studies were highlighted.

7.2 Research Achievements

The main purpose of this section is to summarize and draw conclusions from the research findings based on the findings of this empirical research with 377 decision-makers in Malaysian SMEs. This research evaluated and validated the research model and tested the postulated research hypotheses. This study mainly aimed at developing an integrated model for continuance use of cloud computing services and its effects on the performance of SMEs in Malaysia. To this end, 4 research objectives were formulated to achieve this aim. The following is the brief summary and discussion of these objectives.

7.2.1 RO 1: To identify the most important factors that determine the continuance use of cloud computing services in SMEs.

As a step before the conceptual model development, the study firstly aims to identify the most influencing factors on the continuance use of cloud computing services in SMEs. In line with this, the researcher analyzed and synthesized the studies related to the theories of continuance use and adoption in the organizational level as discussed in chapters 2 and 4. The critical review of the literature resulted in the extraction of 53 factors that affect the continuance use of cloud computing. This research extracted the factors and chose the most common factors in cloud computing adoption and use literature based on the criteria of (Wymer & Regan, 2005). Based on those criteria, 16 factors which affects the continuance use of cloud computing were chosen as follows: "*relative advantage, complexity, perceived security and privacy, compatibility, top management support, cost saving, competitive pressure, IT readiness, organization size, vendor support, regulations and government policy, trialability, perceived reliability, perceived availability, uncertainty, and perceived trust*".

According to sections 4.2 and 4.3, semi-structured interviews using email were conducted with 23 experts (9 IT practitioners and 14 academics) for the validation of the identified factors. The respondents were asked to validate and rank the factors in the context of SMEs in Malaysia. Further, they were asked to state any other factors that were not listed based on their opinion (An open question). In summary, the findings of this work have revealed that cost reduction, top management's support, relative advantage, compatibility, perceived trust, complexity competitive pressure, perceived security and privacy, IT readiness and government support have the highest effect on the decisions for continuance use of cloud computing services based on the experts' perspective. These findings will help in the development of an integrated model for the continuance intention towards using cloud computing services in Malaysian SMEs.

7.2.2 RO 2: To develop an integrated model of the factors influencing the continuance use of cloud computing services and examine its effect on organizational performance.

The second objective of this study was to develop an integrated model of the factors that influence the continuance use of cloud computing services and its effect on the performance of SMEs. To achieve this objective, the extracted and validated factors were classified into three categories, namely technological, organizational, and environmental factors according to the literature discussed in section 4.4. Meanwhile, the ISCM was integrated with the TOE framework, and both theories were adopted as the underlying theoretical lens to determine the continuance use of cloud computing services by the SMEs.

In chapters 2 and 4, the reasons behind the selection of the ISCM and TOE framework as the basis for developing the integrated model in this study were highlighted.

The ISCM factors were integrated with TOE framework factors to measure the continuance use of cloud computing services at the organizational level. Accordingly, the proposed model supposed that the decision for continuance use of cloud computing services in the SMEs context is influenced by four main dimensions- basic constructs of ISCM (confirmation, satisfaction and relative advantage), technological constructs (complexity, compatibility and perceived security and privacy), organizational constructs (top management support, cost-saving, perceived trust and IT readiness), and environmental constructs (competitive pressures and government support).

According to section 4.4.2 and its subsections, the comprehensive demonstration of the hypothesis formulation was provided. Fifteen hypotheses related to the relationships between constructs were developed and an integrated model of the factors that examine the continuance use of cloud computing services and its effect on SMEs performance was proposed as presented in section 4.3 (Figure 4.7).

7.2.3 RO 3: To validate the integrated model for the continuance use of cloud computing services by SMEs.

The third objective of this research was to validate the integrated model using statistical analyses methods. The integrated model was validate using quantitative study analysis which involved the survey instruments' development (Chapter 5), data collection from the participants, and data analysis using SPSS and PLS-SEM (Chapter 6). The detailed process of the research instruments' development was discussed, followed by a pilot study to have an overview of the data applicability in this research. The questionnaire was developed via a systematic three-step process, which included defining the theoretical constructs and items creation, model reviewing process, and measurement testing. For piloting the developed questionnaire, it was used to collect data from 86 SMEs in Malaysia. PLS-SEM was utilized to validate the developed questionnaire.

The findings from the pilot study indicated that the developed questionnaire was reliable and valid; hence, the study can proceed to the final stage. The data was collected from 415 Malaysian SMEs using both internet-based and paper-based surveys (refer to section 5.5). The non-probability method was employed as a sampling technique using purposive sampling (justified in section 3.5 and its subsections). The results of the quantitative analysis were presented precisely in chapter 6.

PLS-SEM technique was used to evaluate the developed model and verify the hypothesized relationships through a two-step approach; the first one is the assessment of the outer measurement model while the second one was the assessment of the inner structural model (section 6.4). Regarding the assessment of the measurement model, the results (presented in section 6.4.1) indicated the confirmation of both reliability and validity. Overall, the results pointed towards the establishment of the measurement model; hence, the study proceeded to the evaluation of the structural model.

Regarding the structural model, it was evaluated using four measures, including hypotheses testing via assessment of the collinearity issues related to the structural model, path coefficients assessment, assessment of coefficient of determination (R^2), assessment of the effect size (f^2), predictive relevance Q^2, and T value. As illustrated in Table 6.16, eleven out of fifteen hypotheses were accepted.

The results showed that the main factors affecting the decision-makers in Malaysian SMEs to continuance use of cloud computing services are confirmation, satisfaction, relative advantage, compatibility, top management support, cost-saving, perceived trust and government support as illustrated in section 7.3. Hypotheses *(H1; H2; H3; H4; H5; H7; H9; H10; H12; H14; H15)* were supported, whereas H6 (Complexity), H8 (Security and privacy), H11 (IT Readiness), and H13 (Competitive Pressure) did not have any significant influence on the SMEs decision-makers to continuance use cloud computing services. The final model explained 78% of the variance in the intention of the decision-makers in Malaysian SMEs to continuance use of cloud computing services, which means that in comparison to previous related researches, the model provided an adequate predictive power of the continuance use of cloud computing services. Confirmation and relative advantage significantly influenced SMEs satisfaction of cloud computing. They were found to explain a significant proportion (54.8%) of the variance in satisfaction factor. Furthermore, the result showed that confirmation explained 23.5% of the variance in the relative advantage. In general, the predictive power of the final model was good as it explained 77.6% of the variance in cloud computing services continuance use, 54.8% of satisfaction, and 23.5% of relative advantage.

Finally, the results of the effect of the continuance use of cloud computing services on the organizational performance of Malaysian SMEs found that the continuance use of cloud computing services explained 28.3% of the variance in organizational performance. The path had positive effects with a beta coefficient value of 0.532, which means that hypothesis H15 was supported. These results were presented in Chapter 6 (Table 6.13). Thus, the third research objective was achieved.

7.2.4 RO.4: To verify and evaluate the applicability of the integrated model in SMEs.

The last objective of this research was to verify and evaluate the applicability of the integrated model in SMEs. To achieve this research objective, a case study strategy has been carried out by employing a semi-structured group interview with five decision-makers at different levels of management in two Malaysian SMEs as the primary data collection method.

Following the findings obtained from two Malaysian SMEs as a case study revealed that all the interviewees confirmed that the research model is complete and comprehensive for cloud computing services continuance use. Furthermore, the model is verified and has the potential for application in the SME context and the model usage would help to improve organizational performance. These results are presented in Section 6.7. Therefore, the fourth research objective was achieved.

7.3 Research Contributions and implications

This research provided some contributions to the theoretical knowledge and implications for both decision-makers in SMEs and cloud computing service providers as will be discussed in the following sections.

7.3.1 Theoretical Contributions

The main contribution of this study is the development of an integrated model for continuance use of cloud computing services and its effect on the performance of SMEs in Malaysia. From the theoretical and research perspectives, the present study offered several significant contributions; First, it is expected that the designed model will integrate the most important factors that affect the continuance use of cloud computing services and the performance of SMEs. There is a remarkable shortage of studies on cloud computing services' continuance use at the organizational level, as most researches were conducted at the individual level as illustrated in section 2.4. Also, the study contributed to the existing body of knowledge by integrating between TOE framework as an adoption theory in the organization level with ISCM and their adoption as the underlying theoretical basis for the determination of the continuous use of cloud computing services by the SMEs. Thus, there is a need to supplement the critical factors at the organization level for the continuance use of technology, especially from the organizational perspective. In this study, the ISCM factors of continuance use of innovation were modified based on the context of cloud computing services at the organization level and integrated with TOE framework as the underlying theoretical basis for the prediction of the continuance use of cloud computing services by the SMEs.

Additional, in terms of the effect of the continuance use of cloud computing services on the organizational performance, the developed model is considered the first that investigated the relationship between SMEs continuance use of cloud computing and their financial and non-financial performance. In other words, the study provided adequate empirical evidence on the positive effects of the continuance adoption on the SMEs' performance. This research will also be beneficial for academics interested in this issue.

7.3.2 Practical Implications

There are several practical implications which decision makers of SMEs and providers of cloud computing service should consider.

The practical contribution of this research will be felt by managers and people in decision-making positions, as it will harness previous knowledge and build on it to benefit organizations. Besides, this research will benefit governmental bodies in developing SMEs in Malaysia, particularly by emphasizing the importance of the continuance use of cloud computing services in driving business performance, promoting the survival and success of SMEs. This could be done by implementing new policies and laws to facilitate the adoption of this technology. The research will also help SMEs in strategic planning, increasing efficiency, promoting organizational and national economic growth over the long term. The research will also serve as a reference for any future study in the field of cloud computing services adoption, marketing, and performance measurement and enhancement.

Furthermore, the outcome of this study can help SMEs decision-makers concentrate on the critical factors during the evaluation, selection, and implementation of cloud computing services. It will also improve their decision-making capabilities as they will basically focus on making intelligent decisions that aligned with business objectives. The outcome of the study will also help the providers of cloud computing services to increase the understanding of the factors that affect cloud services adoption and continues use in SMEs. Cloud computing providers will also benefit from this study in the areas of improving products and marketing strategies, which can increase their competitiveness in the marketplace.

7.4 Limitations and Directions for Future Research

As research on the continuance use of cloud computing services SMEs settings is in the infant stage, this research represents one of the first attempts to empirically identify the factors that predict the continuance use of cloud computing services at the organizational level. Therefore, this research has some limitations that need to be noted, and these limitations may lead to future research directions.

Firstly, time restriction necessitated the adoption of a cross-sectional methodology in this study. Even though it is a good method for identifying the relationship between different constructs, longitudinal research should be considered to highlight the causal relationship between the various constructs by inferring their cause and effect. Secondly, it is possible that the data collected in this study may not be easily generalizable to other SMEs in other countries since the current research employed a non-probability method using purposive sampling technique. In this sense, future research can examine if the results can be generalized to other SMEs in other countries.

Additionally, this research has focused on cloud computing innovation to assess the proposed model; therefore, it would be advisable for future research to test the model on other contexts (e.g., IoT, Big data Online Social Networks and so on). Thirdly, the data for this study was collected on-site at the venues of the selected conferences, seminars, and workshops hosted by SME Corp; therefore, it was difficult to calculate the actual response rate. Fourthly, since the current study is quantitative, it is not possible to get an in-depth understanding of the factors that would influence SMEs decision-makers' continuance use of cloud computing services. Therefore, future researches may employ a qualitative study approach. Finally, there are several opportunities to expand the research model by examining the role of different control variables (such as moderators and mediators). Future researches can consider moderators and mediators' variables to investigate the relationship between the factors affecting cloud computing services continuance use and the relationship between continuance use and organization performance.

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APPENDIX A
QUESTIONNAIRE & CODING

CONTINUANCE USE OF

CLOUD COMPUTING SERVICES AND ITS IMPACT ON SMES PERFORMANCE

Dear Sir/Madam,

You are kindly requested to participate in this survey as you are working for a Small and Medium-sized Enterprise (SMEs).

This survey being conducted by Mohammed A. Al-Sharafi, a PhD candidate; under the supervision of **Associate Professor Dr. Ruzaini bin Abdullah Arshah** from **Faculty of Computer Systems & Software Engineering, Universiti Malaysia Pahang.**

The main purpose of this study is to **examine the impact of continuance use of cloud computing services on small and medium enterprises performance**. The survey can be filled out by decision makers of SMEs (owner\ CEOs and IT manager). It would be much appreciated if you could spend a few minutes of your time in filling the attached questionnaire.

Cloud Computing services is any service such as data storage and software services made available to SMEs on demand via the Internet from a cloud computing provider servers.

There are no anticipated risks to participating in this study. The results of this study may benefit your organization through identifying the factors that can increase organisation performance. Your participation is voluntary, and your identity will be kept as anonymous. All information provided will be strictly confidential and will be purely used for academic purposes. If requested, you can receive a summary of the results of this study when it has been completed

I would like to thank you in advance for kindly agreeing to participate in this survey. If you have any questions about this study or the questionnaire, please find my contact details below to get in touch with me:

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I have read and understand the above information. I agree to participate in this study.
[ ] YES, I agree

a) Has your organisation adopted a cloud computing system *(e.g. Software as-a-Service (SaaS), Infrastructure as a Service (IaaS), or Platform as a service (PaaS))?*

If you responded no, you may skip the rest of this survey

[ ] Yes; [ ] No

b) Did you personally participate in/have input into the decision to adopt cloud computing for your organisation?

[ ] Yes; [ ] No

If you responded no, you may skip the rest of this survey

PART 1: Demographic profile

The following section seeks general information about you and your organization. Please answer by ticking (√) in the appropriate bracket below:

A: Personal Information A: Maklumat Peribadi
Gender [1] Male [2] Female
Age group [1] 18 -25 years [2] 26 - 33 years [3] 34 – 40 years [4] 41 – 50 years [5] 51 years and older
The highest education qualification earned [1] High School and less [2] Diploma [3] Bachelor degree [4] Master Degree [5] PhD
Current position or title at your organization [1] Owner [2] CEO [3] IT Manager [4] Other (please specify):
The total working duration in this position [1] Less than 5 years [2] 5-10 years [3] 11-15 years [4] Over 15 years
B: Organization Information
How many full-time employees currently work at your company? [1] Less than 5 [2] 5 to 29 [3] 30 to 75 [4] 76 to 200 [5] More than 200
In which sector does your organisation operate? [1] Services [2] Manufacturing [3] Technology [4] Financial service [5] Healthcare [6] Retail [7] Education [8] Other (please specify):
Annual sales: Annual revenue (turnover): [1] Less than RM300,000 [2] RM300,000 - RM3 million [3] RM3 million - RM20 million [4] More than RM20 million [5] Confidential [6] Do not know
How long has it been since your organisation is established? [1] less than 1 year [2] 1 – 4 years [3] 5 – 10 years [4] more than 10 years
How long you have been using cloud services? [1] less than 6 months [2] 6 months – 1 year [3] 2 – 5 years [4] more than 5 years
What kind of payment option would you choose when your company decided to adopt cloud computing? [1] Pay-as-you-go [2] License [3] Unlimited access with monthly fee [4] Do not know

PART 2:

A: Technological Factors

Please indicate your agreement to the following statements regarding technology factors that affect continuance cloud computing services adoption in your organisation **[1: Strongly Disagree; 2: Disagree; 3: Neutral; 4: Agree; 5: Strongly Agree]:**

#	**Relative Advantage**	**Please tick one**				
		1	**2**	**3**	**4**	**5**
1	Use of cloud computing services improves our business operations more than traditional technology.	1	2	3	4	5
2	Cloud computing services allows us to accomplish tasks more quickly and manage business operations in an efficient way.	1	2	3	4	5
3	Cloud computing services improves the quality of operations and increase productivity.	1	2	3	4	5
4	Cloud computing services enable employee and stakeholders to access information anywhere, anytime.	1	2	3	4	5
5	Cloud computing services have more advantages than disadvantages.	1	2	3	4	5
#	**Complexity**	**Please tick one**				
		1	**2**	**3**	**4**	**5**
1	Cloud computing services are manageable and easy to use.	1	2	3	4	5
2	It is easy to integrate cloud computing services with existing processes.	1	2	3	4	5
3	Using cloud computing services does not expose our company to the vulnerability of computer breakdowns and loss of data.	1	2	3	4	5
4	Learning how to operate cloud computing services doesn't require complex skills of employees of the organisation.	1	2	3	4	5
5	Overall, we believe that cloud computing services are easy to use.	1	2	3	4	5
#	**Compatibility**	**Please tick one**				
		1	**2**	**3**	**4**	**5**
1	Cloud computing services are compatible with organisation's technological architecture, existing format, interface, and all aspects of our work.	1	2	3	4	5
2	In case of any incompatibility issue, we ask cloud service provider to recommend integrated services.	1	2	3	4	5
3	The changes introduced by cloud computing services are consistent with existing practices in our organisation.	1	2	3	4	5
4	The use of cloud computing services fits the work style of our organisation.	1	2	3	4	5
5	There is no difficulty in exporting/importing, applications/data to cloud services.	1	2	3	4	5
6	Using cloud computing services are compatible with our organisation's corporate culture and value system.	1	2	3	4	5
#	**Perceived Security and Privacy**	**Please tick one**				
		1	**2**	**3**	**4**	**5**
1	Using cloud computing services will lead to secure organisation's data from loss or manipulation by unauthorized persons and hacking.	1	2	3	4	5
2	Cloud service provider does not use our organisation's official data for their own commercial benefits.	1	2	3	4	5

3	Use of cloud computing services provide better security for our organisations' data.	1	2	3	4	5
4	Cloud service providers and their personnel maintain the privacy and confidentiality of organizational data.	1	2	3	4	5
5	Overall, data security and privacy protection are better by using cloud computing services than traditional computing methods.	1	2	3	4	5

B: Organizational Factors

Please indicate your agreement to the following statements regarding organization factors that affect continuance use of cloud computing services in your organisation **[1: Strongly Disagree; 2: Disagree; 3: Neutral; 4: Agree; 5: Strongly Agree]:**

#	Top Management Support	Please tick one				
		1	2	3	4	5
1	The organisation's management provides adequate resources to adopt and implement cloud computing services.	1	2	3	4	5
2	The organisation's top management provides strong leadership and engages in the adoption process when it comes to information systems.	1	2	3	4	5
3	The organisation's management is willing to take risks (financial and organizational) involved in the implementation of cloud computing services.	1	2	3	4	5
4	The organisation's management understands the benefits of cloud computing services.	1	2	3	4	5
5	The organisation's management has a desire to adopt and use new technologies to improve competitive edge.	1	2	3	4	5
#	Cost Saving	Please tick one				
		1	2	3	4	5
1	Cloud computing services reduce operational cost.	1	2	3	4	5
2	The benefits of cloud computing services are greater than the costs of implementation.	1	2	3	4	5
3	Cloud computing services have a considerable cost saving and low purchasing over traditional computing methods in the long run.	1	2	3	4	5
4	Maintenance costs of cloud computing are very low.	1	2	3	4	5
5	Overall, cloud computing services cost is low.	1	2	3	4	5
#	IT Readiness	Please tick one				
		1	2	3	4	5
1	We have sufficient technological resources to implement cloud computing – unrestricted access to computer.	1	2	3	4	5
2	We have sufficient technological resources to implement cloud computing – high bandwidth connectivity to the Internet.	1	2	3	4	5
3	Within the organisation, there are employees who have sufficient skills to implement cloud computing services.	1	2	3	4	5
4	Most of our employees are computer literate.	1	2	3	4	5
5	The organisation knows how IT can be used to support operations.	1	2	3	4	5
#	Perceived Trust	Please tick one				
		1	2	3	4	5
1	Cloud computing services are functioning as we expect.	1	2	3	4	5
2	Suppliers of cloud computing services are trustworthy.	1	2	3	4	5
3	Suppliers of cloud computing services will do everything in their capacity to protect the subscribers' rights.	1	2	3	4	5
4	Suppliers of cloud computing services will do everything to guarantee the privacy and integrity of data made available through cloud computing.	1	2	3	4	5
5	Overall, cloud computing services are trustworthy.	1	2	3	4	5

C: Environmental Factors

Please indicate your agreement to the following statements regarding environment factors that affect continuos use of cloud computing services in your organisation **[1: Strongly Disagree; 2: Disagree; 3: Neutral; 4: Agree; 5: Strongly Agree]:**

#	**Competitive Pressure**	**Please tick one**				
		1	**2**	**3**	**4**	**5**
1	Cloud computing services enable our organisation to achieve better market share than our competitors without cloud computing services.	1	2	3	4	5
2	Cloud computing services increase the ability to outperform the competition.	1	2	3	4	5
3	We understand the competitive advantages offered by cloud computing services.	1	2	3	4	5
4	It is impressive to have cloud computing services when other SMEs do not have.	1	2	3	4	5
5	Our organisation is at a disadvantage if it does not adopt cloud computing services.	1	2	3	4	5
6	Our organisation is under pressure from competitors to adopt cloud computing services.	1	2	3	4	5
#	**Government Support**	**Please tick one**				
		1	**2**	**3**	**4**	**5**
1	Government provides incentives to adopt cloud computing services.	1	2	3	4	5
2	Government procurement policies mandated the use of cloud services.	1	2	3	4	5
3	The provision of affordable high quality broadband availability by the government is important to adopt and implement cloud computing services.	1	2	3	4	5
4	There is adequate legal protection for customer or supplier transactions using cloud computing services.	1	2	3	4	5
5	Overall, adequate government support is provided when we adopted cloud computing services.	1	2	3	4	5
#	**Continuance Use of Cloud Computing Adoption**	**Please tick one**				
		1	**2**	**3**	**4**	**5**
1	We recommend the use of Cloud Computing services to peers.	1	2	3	4	5
2	It is worth using cloud services in our organisation.	1	2	3	4	5
3	We will continue to use the cloud computing service in the future.	1	2	3	4	5
4	Our organisation's need for the cloud computing services will constantly increase in the future.	1	2	3	4	5
5	In the future, we still need to use cloud computing services to support our organisation's work/task	1	2	3	4	5
6	We intend to continue using cloud computing services rather than discontinue using it.	1	2	3	4	5
#	Confirmation	Please tick one				
		1	2	3	4	5
1	Our experience with using cloud computing services was better than what we expected.	1	2	3	4	5
2	The benefits with using cloud computing services were better than we expected.	1	2	3	4	5
3	Cloud computing services support our organisation more than expected.	1	2	3	4	5
4	Overall, most of our expectations from using cloud computing services were confirmed.	1	2	3	4	5
#	**Satisfaction**	**Please tick one**				
		1	**2**	**3**	**4**	**5**
1	Our organisation experience of cloud computing services use was very satisfying.	1	2	3	4	5

2	Our organisation experience of cloud computing services use was very pleasing.	1	2	3	4	5
3	Our organisation experience of cloud computing services use was very contenting.	1	2	3	4	5
4	Our organisation experience of cloud computing services use was absolutely delightful.	1	2	3	4	5

D: Organizational Performance

Please indicate your agreement to the following statements regarding organizational performance in your organisation **[1: Strongly Disagree; 2: Disagree; 3: Neutral; 4: Agree; 5: Strongly Agree]:**

#	Organizational Performance	Please tick one				
		1	**2**	**3**	**4**	**5**
1	Our sales growth rate is higher than it was before the adoption of cloud computing services.	1	2	3	4	5
2	The adoption of cloud computing services increases the profitability and cuts down the operational costs in our organisation in comparison to the time before adopting cloud computing services.	1	2	3	4	5
3	Market share of our company is higher than it was before the adoption of cloud computing services.	1	2	3	4	5
4	Cloud computing services increased financial performance.	1	2	3	4	5
5	Cloud computing services increased productivity.	1	2	3	4	5
6	The satisfaction of our clients is higher after adoption of cloud computing services.	1	2	3	4	5
7	The competitive edge of our organisation is higher after adoption of cloud computing services.	1	2	3	4	5
8	Our organisation ensures that customers´ product and/or service preferences are satisfied after adoption of cloud computing services.	1	2	3	4	5
9	Cloud computing services provide us with more accurate data.	1	2	3	4	5
10	Overall, it is easier to monitor organizational performance with cloud computing services over traditional computing methods.	1	2	3	4	5

Thank You for Your Cooperation

APPENDIX B

QUESTIONNAIRE (ONLINE-BASE)

https://www.surveymonkey.com/r/8B6WLZN

Continuous Use of Cloud-Based Business Services and Its Impact on SMEs Performance

1. Welcome to My Survey

Thank you for participating in our survey. Your feedback is important.

You would only need to spend 10-15 minutes of your time to fill out this questionnaire.
You'll automatically be entered in the draw to win one of the twenty Giant Malls vouchers worth RM50 if you enter your email address in the final question.

Next

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Privacy & Cookie Policy

Continuous Use of Cloud-Based Business Services and Its Impact on SMEs Performance

2. Welcome to My Survey

Dear Sir/Madam,
You are kindly requested to participate in this survey as you are working for a Malaysia Small and Medium-sized Enterprise (SMEs).
The main purpose of this study is **to examine the impact of Continuous Use of Cloud-Based Business Services on SMEs performance**. The survey can be filled out by decision makers of SMEs (owner, CEOs and IT manager). It would be much appreciated if you could spend a few minutes of your time in filling the attached questionnaire.
Cloud Computing is any service such as data storage and software services made available to SMEs on demand via the Internet from a cloud computing provider's servers.
There are no anticipated risks to participating in this study. The results of this study may benefit your organization through identify the factors that can increase firm performance. Your participation is voluntary and your identity will be kept as anonymous. All information provided will be strictly confidential and will be purely used for academic purposes. If requested, you can receive a summary of the results of this study when it has been completed.
I would like to thank you in advance for kindly agreeing to participate in this survey. If you have any questions about this study or the questionnaire please contact me using the information below:

Mohammed Abdullah AL-SHARAFI
Faculty of Computer Systems & Software Engineering
University Malaysia Pahang
Lebuhraya Tun Razak, 26300 Gambang, Pahang
Mobile: 01111303694
Email: MA_SHRAFI@YAHOO.COM

Thank you for participating in our survey. Your feedback is important.

I have read and understand the above information. I agree to participate in this study.

☐ YES, I agree

Prev Next

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Continuous Use of Cloud-Based Business Services and Its Impact on SMEs Performance

3. PART 1: Demographic profile

The following section seeks general information about you and your organization.

A: Personal Information

* What is your gender?

- Male
- Female

* What is your age?

- 18 to 25
- 26 to 33
- 34 to 40
- 41 to 50
- 51 or older

* What is the highest degree you have earned?

- High School and less
- College diploma
- Bachelor degree
- Master Degree
- PhD

* What is your position or title at your organization?

- Owner
- CEOs
- IT Manager
- Other (please specify)

* How long have you been working in this position? *

- Less than 5 years
- 5-10 years
- 11-15 years
- Over 15 years

Prev Next

APPENDIX C

SAMPLE OF PERMISSION LETTER TO COLLECT DATA

Subject: Re: Permission to distribute survey questionnaires

From: zalisman@smecorp.gov.my
To: ma_shrafi@yahoo.com
Cc: marliana@smecorp.gov.my
Date: Tuesday, May 30, 2017, 10:03:55 AM GMT+8

Salam,

We can allow you to distribute the survey questionnaires provided you **does not disturb the participants during the pocket talk session** and **will not force participants** to fill in the survey forms. TQ

Best Regards,

Md Zalisman Md Zahidi (Mr)
Business Advisory& Support Division

"Pioneering Business Transformation"

Level 5 | Block B | Platinum Sentral | Jalan Stesen Sentral 2 | Kuala Lumpur Sentral | 50470 Kuala Lumpur
03 - 2775 6271
03 - 2775 6001
zalisman@smecorp.gov.my
www.smecorp.gov.my

From: "Mohammed A. AL-SHARAFI" <ma_shrafi@yahoo.com>
To: zalisman@smecorp.gov.my, marliana@smecorp.gov.my
Cc: "Ruzaini A. Arshah" <ruzaini@ump.edu.my>, Ruzaini Abdullah Arshah <ruzaini0@gmail.com>
Date: 28/05/2017 10:12 PM
Subject: Permission to distribute survey questionnaires

Dear\ Md Zalisman bin Md Zahidi
Dear\ Cik Nor Marliana

My name is Mohammed Abdullah Al-Sharafi, and I am a Ph.D. candidate; under the supervision of Associate Professor Dr. Ruzaini bin Abdullah Arshah from Faculty of Computer Systems & Software Engineering, Universiti Malaysia Pahang.
The research I wish to conduct for my doctoral thesis involves **"The impact of cloud computing adoption on small and medium enterprises performance".**
Regarding this issue, **we would like to ask your permission to distribute attached survey questionnaires** to the participant on the day of the event you have arranged "POCKET TALK@SME CORP. MALAYSIA: Bagaimana Mendapatkan Dana Sehingga RM 450,000 melalui 'Crowdfunding'?"

This will yield very interesting results and your support is highly appreciated.
Thank you for your time and favorable response.

Yours Sincerely
Mohammed A. AL-SHARAFI
PhD Candidate
Faculty of Computer Systems & Software Engineering
University Malaysia Pahang
Lebuhraya Tun Razak, 26300 Gambang, Pahang

Phone: (+60) 1111303694[attachment "ENGLISH-QUESTIONNAIRE-V2- 31 may.pdf" deleted by Md Zalisman Md Zahidi/PC/SMECORP]

APPENDIX D

EXPERTS EMAIL INVITATION

Factors Influencing Continuance Adoption of Cloud Computing Services in SMEs

Dear Participant,

I am a researcher at University Malaysia Pahang, conducting a study on the influencing of cloud computing services continuous adoption on Small and Medium Enterprises (SMEs) performance.

Based on the factors most literature review, this questionnaire was designed to identify the most importance factors that influencing to decision makers to continuous adoption of cloud computing services.

I strongly believe you are the **SELECTED ONE** **who will be able to give me the valuable comments on this topic**.Your experiences, views and comments on this topic would be a valuable source of information for my research.

Notes for the experts:

- As a participant in this study, you can expect two rounds of surveys to obtain sufficient information. The second round of questions may occur if more information is necessary.
- Surveys will be securely distributed and will not include any video or audio recording.
- The anticipated amount of time for the completion of each round is approximately 10- 15 minutes and could be completed within one week of receiving the survey link.
- Your identity will be coded to ensure anonymity. Only the researcher will have access to this code further securing the confidentiality of your identity.
- The results of the research study may be published but your identity will remain confidential and your name will not be disclosed to any outside party.

If you would like further information about the study please contact me (Mohammed A. Al-Sharafi) at ma_shrafi@yahoo.com

Kindly, I request you to respond to the following questions:

Please fill up your information below:

* Contact email:

Position:

* Research Area :

* Year of Experience:

- 1-5 yrs
- 6-10 yrs
- above 10 yrs

Next

Factors Influencing Continuance Adoption of Cloud Computing Services in SMEs

Factors Rating

The questions below contains factors that are used to determine the cloud computing adoption by organizations (**as retrieved from literature**) could you please:

- **validate them**
- **add any other factors that you used in performing cloud computing adoption process.**

Based on your experience, using point Likert scale while
1 Star = Not at all Important
2 Stars = Low Importance
3 Stars = Slightly Important
4 Stars = Neutral
5 Stars = Moderately Important
6 Stars = Very Important
7 Stars =Extremely Important
please rate the following factors that can possibly impact the Continuance Adoption of Cloud Computing Services in SMEs.

* **Relative advantage:** The degree to which SME using a cloud computing services would enhance its performance.

Not at all Important	Low Importance	Slightly Important	Neutral	Moderately Important	Very Important	Extremely Important
☆	☆	☆	☆	☆	☆	☆

Comment (Optional)

* **Complexity:** The perceived degree of difficulty of understanding and using cloud computing services.

Not at all Important	Low Importance	Slightly Important	Neutral	Moderately Important	Very Important	Extremely Important
☆	☆	☆	☆	☆	☆	☆

Comment (Optional)

* **Perceived security and privacy:** The degree of cloud computing services that is deemed secure and private compare to other computing paradigms.

Not at all Important	Low Importance	Slightly Important	Neutral	Moderately Important	Very Important	Extremely Important
☆	☆	☆	☆	☆	☆	☆

Comment (Optional)

* **Compatibility:** The degree to which the cloud computing services fits with the potential adopter's existing values, previous practices, and current needs.

Not at all Important	Low Importance	Slightly Important	Neutral	Moderately Important	Very Important	Extremely Important

Comment (Optional)

Other Factors: Do you have other factors not mentioned above. Please state it below:

What are other factors were considered to adopt Cloud services at SMEs?

Please indicate any comments or notes: Please provide any feedback and comments about your experience in completing this survey and/or your experience in Information Technology Adoption you think is helpful to this research.

Prev Done

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APPENDIX E

CROSS LOADINGS RESULTS (PILOT STUDY STAGE)

	CMP	CMX	CNF	CPP	CTS	CUCC	GVS	ITR	OGP	RLA	SCP	STS	TMS	TRS
CMP1	0.821	0.638	-0.049	0.592	0.649	0.714	0.579	0.639	0.613	0.577	0.596	0.537	0.6	0.516
CMP2	0.856	0.584	-0.023	0.644	0.606	0.719	0.613	0.638	0.553	0.584	0.578	0.473	0.561	0.474
CMP3	0.78	0.526	0.057	0.487	0.523	0.603	0.533	0.548	0.569	0.497	0.526	0.436	0.476	0.434
CMP4	0.841	0.632	0.05	0.551	0.717	0.723	0.625	0.643	0.698	0.601	0.664	0.524	0.609	0.6
CMP5	0.725	0.482	0.07	0.586	0.532	0.565	0.485	0.531	0.574	0.522	0.555	0.411	0.436	0.402
CMP6	0.757	0.477	0.104	0.581	0.614	0.621	0.517	0.592	0.589	0.547	0.558	0.463	0.517	0.439
CMX1	0.53	0.83	-0.006	0.522	0.635	0.684	0.515	0.568	0.544	0.562	0.623	0.476	0.498	0.51
CMX2	0.606	0.813	0.149	0.543	0.634	0.699	0.559	0.596	0.46	0.577	0.625	0.593	0.529	0.466
CMX3	0.612	0.875	0.209	0.53	0.691	0.736	0.575	0.605	0.569	0.659	0.714	0.594	0.533	0.502
CMX4	0.507	0.753	0.159	0.427	0.585	0.631	0.545	0.529	0.463	0.453	0.54	0.458	0.552	0.449
CMX5	0.635	0.855	0.045	0.586	0.648	0.744	0.624	0.677	0.543	0.635	0.603	0.554	0.651	0.579
CNF1	0.015	0.092	0.89	0.098	0.078	0.086	0.037	0.103	0.11	0.226	0.322	0.358	0.002	0.151
CNF2	-0.002	0.085	0.837	0.095	0.106	0.118	0.015	0.098	0.113	0.155	0.366	0.347	-0.05	0.066
CNF3	0.077	0.159	0.895	0.226	0.194	0.212	0.104	0.188	0.057	0.31	0.408	0.476	0.106	0.217
CNF4	0.027	0.113	0.859	0.208	0.162	0.114	0.104	0.169	0.101	0.234	0.332	0.327	0.106	0.141
CPP1	0.626	0.556	0.127	0.846	0.709	0.712	0.652	0.668	0.575	0.706	0.647	0.567	0.614	0.576
CPP2	0.613	0.591	0.157	0.805	0.646	0.698	0.639	0.663	0.502	0.621	0.604	0.575	0.603	0.585
CPP3	0.506	0.455	0.199	0.804	0.567	0.634	0.521	0.635	0.453	0.639	0.651	0.574	0.517	0.573

CPP4	0.566	0.502	0.167	0.791	0.596	0.657	0.543	0.62	0.564	0.689	0.606	0.583	0.55	0.575
CPP5	0.682	0.553	0.125	0.832	0.689	0.721	0.663	0.687	0.535	0.624	0.65	0.599	0.623	0.559
CPP6	0.503	0.432	0.149	0.815	0.581	0.632	0.521	0.579	0.35	0.648	0.574	0.584	0.448	0.509
CTS1	0.636	0.654	0.174	0.67	0.854	0.772	0.646	0.756	0.604	0.681	0.71	0.56	0.665	0.529
CTS2	0.557	0.605	-0.012	0.565	0.787	0.663	0.63	0.554	0.469	0.557	0.553	0.493	0.552	0.459
CTS3	0.694	0.653	0.168	0.708	0.879	0.762	0.641	0.732	0.61	0.604	0.702	0.604	0.602	0.538
CTS4	0.556	0.616	0.116	0.519	0.762	0.66	0.58	0.582	0.563	0.634	0.622	0.495	0.456	0.466
CTS5	0.669	0.634	0.195	0.697	0.798	0.716	0.705	0.701	0.708	0.657	0.624	0.576	0.724	0.647
CUCC1	0.688	0.643	0.102	0.731	0.795	0.825	0.747	0.746	0.629	0.664	0.733	0.664	0.614	0.562
CUCC2	0.743	0.707	0.053	0.771	0.772	0.871	0.733	0.775	0.595	0.717	0.75	0.646	0.673	0.718
CUCC3	0.703	0.781	0.184	0.682	0.786	0.857	0.65	0.742	0.569	0.711	0.753	0.704	0.641	0.564
CUCC4	0.737	0.804	0.116	0.68	0.725	0.866	0.703	0.753	0.597	0.699	0.756	0.66	0.685	0.586
CUCC5	0.737	0.745	0.171	0.673	0.734	0.853	0.693	0.709	0.596	0.677	0.734	0.651	0.642	0.518
CUCC6	0.577	0.604	0.199	0.672	0.617	0.794	0.626	0.698	0.469	0.748	0.63	0.624	0.579	0.623
FOP1	0.561	0.538	0.108	0.571	0.604	0.564	0.544	0.54	0.761	0.553	0.564	0.455	0.514	0.397
FOP2	0.584	0.444	0.081	0.519	0.599	0.552	0.58	0.597	0.801	0.57	0.518	0.434	0.522	0.571
FOP3	0.578	0.513	0.09	0.525	0.616	0.547	0.464	0.569	0.788	0.52	0.53	0.44	0.531	0.457
FOP4	0.543	0.431	0.026	0.406	0.544	0.456	0.42	0.518	0.719	0.429	0.4	0.304	0.486	0.442
FOP5	0.683	0.598	0.038	0.556	0.672	0.649	0.592	0.677	0.839	0.585	0.606	0.427	0.625	0.507
GVS1	0.573	0.57	0.005	0.631	0.666	0.673	0.833	0.691	0.636	0.599	0.518	0.528	0.685	0.492
GVS2	0.568	0.582	0.083	0.629	0.659	0.68	0.845	0.589	0.49	0.638	0.53	0.535	0.621	0.52
GVS3	0.535	0.523	0.042	0.56	0.649	0.665	0.848	0.614	0.524	0.584	0.529	0.545	0.607	0.548

GVS4	0.623	0.622	0.133	0.586	0.615	0.724	0.841	0.611	0.525	0.634	0.579	0.569	0.636	0.57
GVS5	0.66	0.58	0.064	0.659	0.717	0.716	0.851	0.674	0.628	0.604	0.631	0.556	0.696	0.51
ITR1	0.548	0.586	0.161	0.645	0.665	0.682	0.626	0.787	0.58	0.56	0.597	0.489	0.532	0.551
ITR2	0.695	0.558	0.08	0.632	0.664	0.706	0.566	0.793	0.609	0.627	0.647	0.576	0.505	0.56
ITR3	0.595	0.593	0.258	0.642	0.657	0.714	0.601	0.841	0.578	0.625	0.613	0.51	0.601	0.51
ITR4	0.531	0.501	0.092	0.525	0.54	0.624	0.536	0.753	0.505	0.545	0.513	0.442	0.566	0.49
ITR5	0.637	0.647	0.071	0.703	0.738	0.763	0.683	0.829	0.625	0.654	0.622	0.568	0.69	0.551
NOP1	0.626	0.502	-0.053	0.457	0.561	0.554	0.58	0.572	0.853	0.487	0.495	0.402	0.605	0.423
NOP2	0.618	0.449	0.16	0.424	0.525	0.489	0.503	0.569	0.823	0.468	0.566	0.468	0.471	0.392
NOP3	0.59	0.461	0.131	0.457	0.49	0.526	0.52	0.572	0.792	0.478	0.543	0.445	0.506	0.549
NOP4	0.537	0.459	0.16	0.406	0.516	0.502	0.502	0.531	0.721	0.458	0.565	0.444	0.522	0.393
NOP5	0.61	0.526	0.108	0.488	0.584	0.543	0.53	0.573	0.811	0.561	0.564	0.408	0.543	0.573
RLA1	0.532	0.544	0.199	0.675	0.591	0.669	0.608	0.642	0.542	0.833	0.685	0.706	0.512	0.62
RLA2	0.626	0.554	0.206	0.591	0.696	0.707	0.645	0.6	0.527	0.817	0.64	0.637	0.547	0.581
RLA3	0.553	0.646	0.351	0.733	0.634	0.703	0.562	0.674	0.542	0.866	0.711	0.678	0.556	0.613
RLA4	0.604	0.594	0.109	0.638	0.638	0.699	0.592	0.562	0.537	0.824	0.648	0.615	0.584	0.56
RLA5	0.592	0.586	0.271	0.701	0.636	0.676	0.62	0.657	0.556	0.823	0.641	0.54	0.588	0.6
SCP1	0.501	0.534	0.331	0.63	0.569	0.576	0.457	0.582	0.533	0.587	0.731	0.662	0.457	0.457
SCP2	0.608	0.676	0.293	0.579	0.61	0.714	0.569	0.585	0.561	0.659	0.812	0.73	0.492	0.482
SCP3	0.577	0.527	0.435	0.576	0.609	0.643	0.46	0.575	0.462	0.656	0.772	0.657	0.372	0.525
SCP4	0.623	0.56	0.286	0.591	0.67	0.691	0.499	0.581	0.546	0.596	0.818	0.659	0.559	0.539
SCP5	0.536	0.639	0.291	0.622	0.628	0.733	0.593	0.613	0.555	0.633	0.781	0.679	0.537	0.56

STS1	0.536	0.575	0.44	0.609	0.584	0.666	0.476	0.575	0.467	0.673	0.766	0.887	0.416	0.596
STS2	0.567	0.594	0.237	0.635	0.584	0.69	0.562	0.53	0.455	0.639	0.741	0.83	0.46	0.527
STS3	0.477	0.546	0.376	0.599	0.582	0.661	0.642	0.548	0.492	0.706	0.729	0.837	0.528	0.455
STS4	0.427	0.47	0.44	0.553	0.502	0.607	0.502	0.528	0.38	0.552	0.675	0.814	0.412	0.418
TMS1	0.644	0.596	0.07	0.651	0.692	0.697	0.729	0.668	0.6	0.614	0.598	0.545	0.871	0.536
TMS2	0.604	0.473	-0.006	0.593	0.581	0.632	0.68	0.6	0.638	0.561	0.513	0.485	0.829	0.559
TMS3	0.499	0.559	0.089	0.514	0.579	0.605	0.634	0.549	0.516	0.506	0.479	0.393	0.857	0.469
TMS4	0.445	0.541	0.035	0.494	0.52	0.528	0.522	0.51	0.457	0.482	0.412	0.341	0.794	0.456
TMS5	0.617	0.646	0.044	0.632	0.712	0.71	0.661	0.701	0.617	0.633	0.586	0.487	0.866	0.478
TRS1	0.501	0.494	0.156	0.583	0.495	0.568	0.514	0.526	0.469	0.583	0.526	0.528	0.471	0.786
TRS2	0.441	0.459	0.183	0.492	0.478	0.515	0.514	0.464	0.428	0.523	0.509	0.469	0.436	0.792
TRS3	0.485	0.446	0.063	0.533	0.474	0.519	0.441	0.454	0.474	0.546	0.493	0.413	0.41	0.758
TRS4	0.462	0.518	0.135	0.497	0.539	0.559	0.507	0.609	0.549	0.548	0.505	0.406	0.515	0.778
TRS5	0.466	0.46	0.141	0.587	0.54	0.582	0.472	0.535	0.41	0.59	0.528	0.501	0.479	0.794

APPENDIX F

UNIVARIATE OUTLIER'S RESULTS

Construct	Item	Standardized value (Z-Score)	
		Lower Bound	Upper Bound
Relative Advantage (RLA)	RLA1	-2.472	1.611
	RLA2	-2.557	1.713
	RLA3	-2.498	1.755
	RLA4	-2.581	1.636
	RLA5	-2.573	1.518
Complexity (CMX)	CMX1	-2.644	1.693
	CMX2	-2.446	1.846
	CMX3	-2.536	1.895
	CMX4	-2.438	1.773
	CMX5	-2.494	1.692
Compatibility (CMP)	CMP1	-2.747	1.697
	CMP2	-2.574	1.773
	CMP3	-2.650	1.904
	CMP4	-2.582	1.842
	CMP5	-1.724	1.568
	CMP6	-2.619	1.764
Perceived Security and Privacy (SCP)	SCP1	-2.890	1.679
	SCP2	-2.340	1.833
	SCP3	-2.263	1.865
	SCP4	-2.384	1.839
	SCP5	-2.330	1.724
Top Management Support (TMS)	TMS1	-2.660	1.828
	TMS2	-2.372	1.755
	TMS3	-2.649	1.701
	TMS4	-2.530	1.764
	TMS5	-2.508	1.577
Cost Saving (CTS)	CTS1	-1.806	1.768
	CTS2	-2.856	1.725
	CTS3	-2.813	1.479
	CTS4	-2.724	1.641
	CTS5	-2.928	1.495
IT Readiness (ITR)	ITR1	-2.552	1.676
	ITR2	-2.209	1.884
	ITR3	-2.406	1.912
	ITR4	-2.171	1.847
	ITR5	-2.368	1.841
Perceived Trust (TRS)	TRS1	-2.440	1.788
	TRS2	-2.390	1.876
	TRS3	-2.275	1.808

	TRS4	-2.283	1.757
	TRS5	-2.235	1.737
Competitive Pressure (CPP)	CPP1	-2.535	1.686
	CPP2	-2.390	1.769
	CPP3	-2.492	1.636
	CPP4	-2.440	1.693
	CPP5	-2.444	1.670
	CPP6	-1.898	1.547
Government Support (GVS)	GVS1	-2.258	1.747
	GVS2	-2.380	1.635
	GVS3	-2.518	1.613
	GVS4	-2.403	1.574
	GVS5	-2.653	1.602
Continuance Use of Cloud Computing Adoption (CUCC)	CUCC1	-1.774	1.479
	CUCC2	-2.674	1.510
	CUCC3	-2.703	1.436
	CUCC4	-2.636	1.416
	CUCC5	-1.760	1.411
	CUCC6	-2.520	1.251
Confirmation (CNF)	CNF1	-2.488	1.457
	CNF2	-2.477	1.618
	CNF3	-2.384	1.601
	CNF4	-2.417	1.615
Satisfaction (STS)	STS1	-2.623	1.650
	STS2	-2.555	1.734
	STS3	-2.462	1.613
	STS4	-2.595	1.480
Organizational Performance(OGP)	FOP1	-2.382	1.545
	FOP2	-2.512	1.692
	FOP3	-2.406	1.678
	FOP4	-2.487	1.629
	FOP5	-2.646	1.623
	NOP1	-2.529	1.543
	NOP2	-2.610	1.710
	NOP3	-2.351	1.710
	NOP4	-2.526	1.701
	NOP5	-2.642	1.547

As shown in the Table above, the results indicated that the standardised (z) scores of the cases for the research variables ranged from -2.928 to 1.912, indicating that none of the items exceeded the threshold of ±4. Thus there is no any univariate outlier among the initial 76 cases.

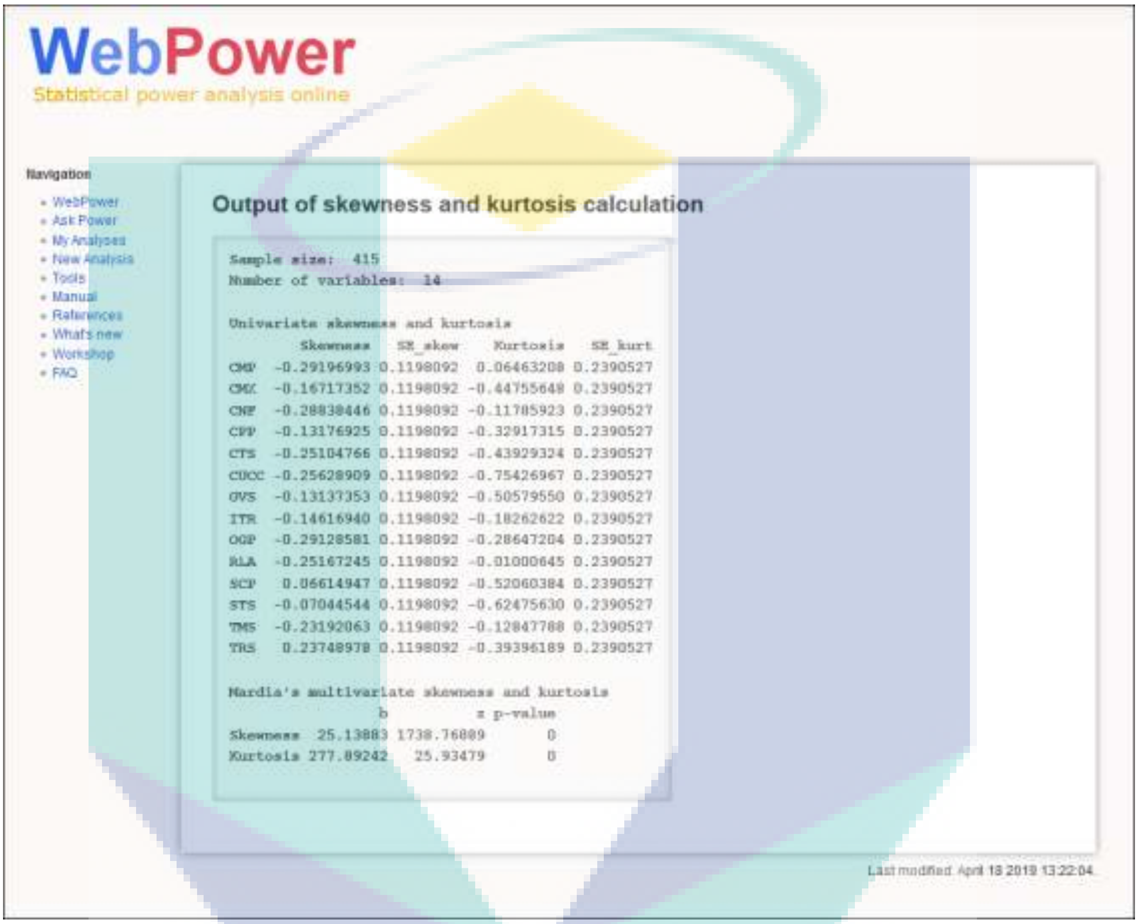
APPENDIX G

MULTIVARIATE OUTLIER'S RESULTS

Case #	Mahalanobis Distance values (D2)	Probability-MD (D2/df)	Result
22	27.14072	0.00014	Outliers
26	33.18987	0.00001	Outliers
51	27.69308	0.00011	Outliers
57	24.98543	0.00034	Outliers
59	24.03633	0.00051	Outliers
64	31.27395	0.00002	Outliers
69	34.28743	0.00001	Outliers
143	25.56848	0.00027	Outliers
145	22.64822	0.00092	Outliers
146	23.1622	0.00074	Outliers
147	25.03813	0.00034	Outliers
154	24.74056	0.00038	Outliers
171	33.25285	0.00001	Outliers
172	32.82703	0.00001	Outliers
183	22.72543	0.00089	Outliers
188	24.63509	0.0004	Outliers
190	26.19864	0.0002	Outliers
255	23.8928	0.00055	Outliers
266	23.87431	0.00055	Outliers
282	27.39853	0.00012	Outliers
283	23.6614	0.0006	Outliers
290	25.53095	0.00027	Outliers
293	28.3251	0.00008	Outliers
296	24.36053	0.00045	Outliers
297	41.70106	0	Outliers
298	23.59269	0.00062	Outliers
300	38.15665	0	Outliers
302	23.5229	0.00064	Outliers
307	39.35668	0	Outliers
315	23.26191	0.00071	Outliers
316	27.85254	0.0001	Outliers
319	22.67114	0.00091	Outliers
322	23.5468	0.00063	Outliers
325	26.14317	0.00021	Outliers
331	24.84949	0.00036	Outliers
333	29.82126	0.00004	Outliers
344	32.4955	0.00001	Outliers
409	25.91154	0.00023	Outliers

APPENDIX H

NORMALIT TEST RESULTS(MULTIVARIATE SKEWNESS AND KURTOSIS)



WebPower

Statistical power analysis online

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Output of skewness and kurtosis calculation

Sample size: 415

Number of variables: 14

Univariate skewness and kurtosis

	Skewness	SE_skew	Kurtosis	SE_kurt
CMP	-0.29196993	0.1198092	0.06463208	0.2390527
CMX	-0.16717352	0.1198092	-0.44755648	0.2390527
CNF	-0.28838446	0.1198092	-0.11785923	0.2390527
CPP	-0.13176925	0.1198092	-0.32917315	0.2390527
CTS	-0.25104766	0.1198092	-0.43929324	0.2390527
CUCC	-0.25628909	0.1198092	-0.75426967	0.2390527
OVS	-0.13137353	0.1198092	-0.50579550	0.2390527
ITR	-0.14616940	0.1198092	-0.18262622	0.2390527
OGP	-0.29128581	0.1198092	-0.28647204	0.2390527
RLA	-0.25167245	0.1198092	-0.01000645	0.2390527
SCP	0.06614947	0.1198092	-0.52060384	0.2390527
STS	-0.07044544	0.1198092	-0.62475630	0.2390527
TMS	-0.23192063	0.1198092	-0.12847788	0.2390527
TRS	0.23748978	0.1198092	-0.39396189	0.2390527

Mardia's multivariate skewness and kurtosis

	b	z	p-value
Skewness	25.13883	1738.76889	0
Kurtosis	277.89242	25.93479	0

Last modified: April 18 2019 13:22:04

APPENDIX I

HARMAN'S SINGLE FACTOR TEST RESULTS

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	29.276	38.522	38.522	28.679	37.736	37.736
2	3.624	4.768	43.289			
3	2.821	3.712	47.001			
4	2.506	3.297	50.298			
5	1.954	2.571	52.869			
6	1.744	2.294	55.164			
7	1.540	2.026	57.190			
8	1.464	1.926	59.116			
9	1.332	1.752	60.868			
10	1.223	1.610	62.477			
11	1.129	1.485	63.963			
12	1.048	1.379	65.342			
13	1.025	1.349	66.691			
14	0.929	1.222	67.913			
15	0.883	1.162	69.075			
16	0.809	1.064	70.139			
17	0.776	1.021	71.161			
18	0.765	1.007	72.168			
19	0.720	0.948	73.116			
20	0.701	0.923	74.038			
21	0.681	0.896	74.934			
22	0.650	0.855	75.789			
23	0.620	0.816	76.605			
24	0.606	0.797	77.402			
25	0.593	0.780	78.182			
26	0.581	0.764	78.946			
27	0.570	0.749	79.695			
28	0.552	0.726	80.422			
29	0.533	0.701	81.123			
30	0.520	0.685	81.807			
31	0.505	0.665	82.472			
32	0.496	0.653	83.125			
33	0.492	0.647	83.772			
34	0.477	0.627	84.399			
35	0.466	0.613	85.012			
36	0.453	0.596	85.608			
37	0.440	0.579	86.187			
38	0.432	0.568	86.755			
39	0.420	0.553	87.308			

Table Continued

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
40	0.413	0.543	87.851			
41	0.405	0.533	88.384			
42	0.389	0.512	88.895			
43	0.384	0.506	89.401			
44	0.377	0.496	89.897			
45	0.364	0.479	90.376			
46	0.348	0.458	90.833			
47	0.346	0.455	91.288			
48	0.333	0.438	91.727			
49	0.326	0.430	92.156			
50	0.317	0.417	92.573			
51	0.308	0.405	92.978			
52	0.304	0.400	93.378			
53	0.302	0.397	93.776			
54	0.292	0.384	94.160			
55	0.280	0.368	94.528			
56	0.274	0.360	94.888			
57	0.267	0.352	95.240			
58	0.257	0.338	95.578			
59	0.253	0.334	95.911			
60	0.240	0.316	96.227			
61	0.234	0.308	96.535			
62	0.221	0.291	96.826			
63	0.216	0.285	97.111			
64	0.210	0.276	97.387			
65	0.207	0.272	97.660			
66	0.198	0.261	97.920			
67	0.194	0.255	98.175			
68	0.186	0.245	98.420			
69	0.179	0.235	98.655			
70	0.172	0.227	98.881			
71	0.162	0.213	99.094			
72	0.152	0.200	99.295			
73	0.149	0.196	99.491			
74	0.140	0.185	99.675			
75	0.132	0.174	99.850			
76	0.114	0.150	100.000			

Extraction Method: Principal Axis Factoring.

APPENDIX J

SEMI-STRUCTURED GROUP INTERVIEW DOCUMENT

Section (A): Consent Form–Interviews.

Dear Participant,

You have been invited to take part in a research study about the continuance use of cloud computing services and its impact on SMEs organizational performance. This study will be conducted by Mohammed Abdullah Al-Sharafi ID (PCC15013) at faculty of Computing, Universiti Malaysia Pahang a part of her doctoral research.

If you agree to be in this study, you will be asked to participate in a semi-structured interview about your work experience, especially in the cloud computing usage in your company.

There are no known risks associated with your participation in this research beyond those of everyday life. Although you will receive no direct benefits, this research may help the researcher understand the factors that influence the continuous use of cloud computing services in small and medium enterprises (SMEs) and investigate its impact on SMEs' organizational performance.

Confidentiality of your research records will be strictly maintained by assigning pseudonyms to you and your firm as well as by obscuring specific identifying details associated with you or your firm prior to publication.

I would be very grateful if you could spend 60 to 90 minutes of your valuable time to participate in this research.

Agreement:

The nature and purpose of this research have been sufficiently explained and I agree to participate in this study. I understand that I am free to withdraw at any time without incurring any penalty.

Participant's Signature Date

____________________________ ____________________

Section (B): Introduction to the Model

The Process of model development:

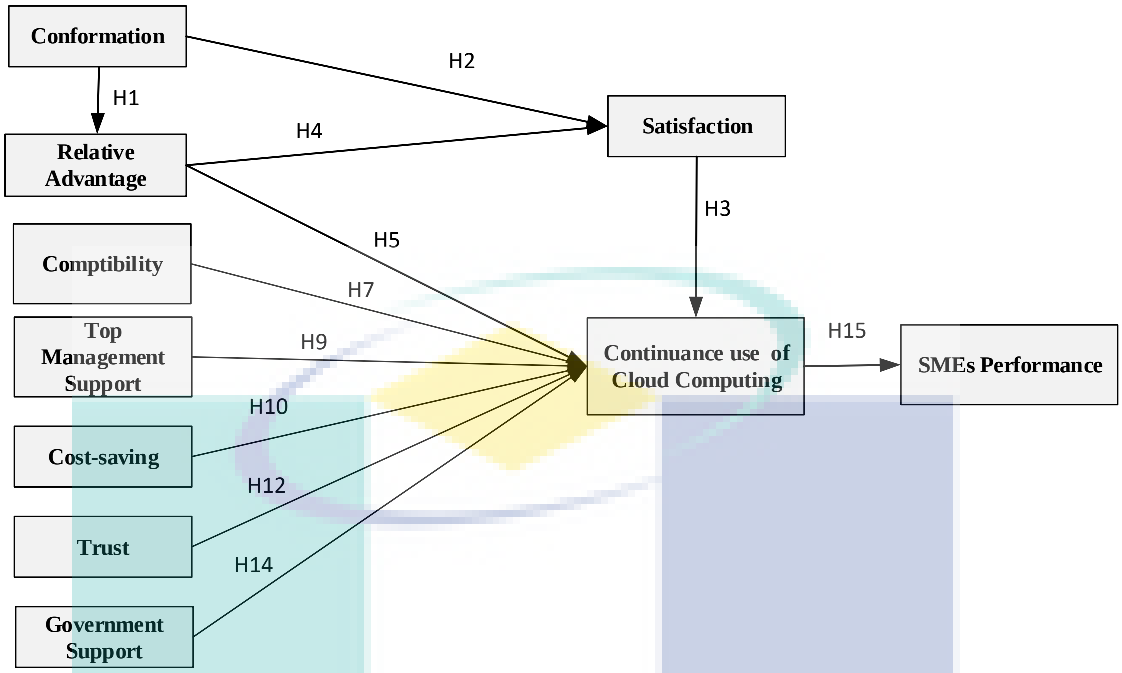
The need for the model of continuance use of cloud computing.

This study aims to provide an integrated model for the continuance use of cloud computing services towards SME organizational performance by examining the factors that affect the continuance use of cloud computing services in Malaysian SMEs and investigate the effect of this use in their organizational performance.

The model designed to help organizations maximize the value of cloud computing services by increasing knowledge about the extent to which various factors affect the continuous use of cloud computing services. Furthermore, the developed model will help cloud computing services providers to increase their competitive edge and will help SMEs to increase their financial and non-financial performance.

Model Testing and Results:

To test the model and the hypotheses between the factors, a survey data was collected from the decision-makers of SME who utilized cloud computing in their organization activities. The data from 377 SMEs were analyzed Using SEM-PLS. The results show that 11 out of 15 proposed hypotheses were significant, which illustrates that the proposed factors (i.e. relative advantage, confirmation, satisfaction, compatibility, top management support, cost-saving, trust, government support) have a positive influence on the decision-makers of Malaysian SMEs. Conversely, other factors, such as complexity, security and privacy, IT readiness and competitive pressure, do not significantly influence the continuance use of cloud computing services. In addition, the research model explains the substantial variance (78%) of the continuance use of cloud computing services, thereby clearly indicating that the developed model is valid


Conformation
H1
H2
Relative Advantage
H4
Satisfaction
H3
H5
Comptibility
H7
Top Management Support
H9
Continuance use of Cloud Computing
H15
SMEs Performance
H10
Cost-saving
H12
Trust
H14
Government Support

Section (C): SEMI-STRUCTURED GROUP INTERVIEW SCRIPT

Part (1): Organization Information

The following questions seek general information about your organization.

Q1. Can you please tell us about your firm's background? (Number of employees/ Annual revenue (turnover) / main services industry/ Years since establishment, …)

Q2. How long you have been using cloud services?

Q3. Why has your firm decided to use cloud computing services?

Q4. Which IT Services/Applications do you moved to a cloud computing service provider in your organization?

Part (2): Open-Ended Interview Questions

Question 1: *In your opinion, to what extent this model is comprehensive and valid for cloud computing services continuance use?*

Question 2*: In your opinion, how can the integrated model be applied in the SME sector?*

Part (3): Close-Ended Interview Questions

Question 3: *In your opinion, how the use of cloud computing services impact organizational performance of your SME? Please answer the following questions (tick) based on your opinion and expertise.*

Indicator / Effect	Very High	Above Average	Average	Below Average	Very Low
Sales growth					
Profitability					
Reduce the operating costs					
Market share					
Productivity					
Client's satisfaction					
Competitive advantage					
Accurate data					

Comments and Recommendations

……………………………………………………………………………………

……………………………………………………………………………………

……………………………………………………………………………………

……………………………………………………………………………………

……………………………………………………………………………………

…………………………………………………………

Name: ....

Position: ....

Organization: ....

Profession: ....

Years of Experience: ....

Participant's Signature & Official Stamp Date

______________________________ ________________________

Thank you for your cooperation

APPENDIX K

SAMPLE OF ONLINE SURVEY- CLOSED-ENDED QUESTIONS

CONTINUANCE USE OF CLOUD COMPUTING SERVICES

CONTINUANCE USE OF CLOUD COMPUTING SERVICES

Personal Information

Gender *

	1	2	
Male	(●)	( )	Female

Age *

- ( ) 18-25
- ( ) 26-35
- (●) 36-45
- ( ) 46-55
- ( ) 56 and above

Company name *

International Modern Arabic School (IMAS)

Position *

Principle of School

Do your company agree to continue using cloud computing services? *

- ○ Strongly disagree
- ○ Disagree
- ○ Neutral
- ○ Agree
- ◉ Strongly agree

Factors Evaluation

Please indicate your agreement to the following statements regarding technology factors that affect continuance cloud computing services adoption in your organization [1: Strongly Disagree; 2: Disagree; 3: Neutral; 4: Agree; 5: Strongly Agree]:

RA1: The use of cloud computing services has improved our business operations more than traditional technology. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

RA2:Cloud computing services have allowed us to accomplish tasks more quickly and efficiently manage business operations. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

RA3:Cloud computing services have improved the quality of operations and increase productivity.. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

RA4:Cloud computing services have enabled employees and stakeholders to access information anywhere, anytime. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree