

**FACTORS AFFECTING ADOPTION OF MOBILE CLOUD COMPUTING
(MCC) AMONG THE USERS IN MALACCA**

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**The thesis is submitted in partial fulfilment of the requirements for the award
of Bachelor of Technology Management (Innovation Technology)**

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I/We, here declared that I/We had read through this thesis and in my/our opinion that this thesis is adequate in term of scope and quality which fulfil the requirements for the award of Bachelor of Technology Management (Innovation Technology).

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DEDICATION

I would like to dedicate the appreciation to my parents who supported me from spiritually and financially, beloved supervisor and also panel who guided me to finish and complete the research, my housemates and course mates that assisted and helped me through the journey of research.

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ABSTRACT

Recently, mobile devices have become a necessary gadget in our life and the numbers of people having mobile devices are on the rise. Mobile devices have many features, such as call, message, capture photo, surf internet and so on. While, Mobile Cloud Computing (MCC) is an emergence of multiple Internet-based technologies development, which enables mobile users to get advantages of cloud computing and achieve green computing by using their mobile devices. The main objective of the researcher in this study is to identify the factors that affecting adoption of Mobile Cloud Computing (MCC) among the mobile devices users in Malacca. Data of this study will collect by using questionnaires from 384 respondents in Malacca. The factors affecting adoption of Mobile Cloud Computing (MCC) among the users in Malacca include perceived ease of use, perceived connectedness, perceived security, perceived usefulness and service and system quality. Perceived ease of use, perceived connectedness, perceived usefulness, service and system quality are significant to the factors affecting the adoption Mobile Cloud Computing. The result of this study contributes exceptional judgement to mobile device users and the Mobile Cloud Computing developers in Malaysia.

Keywords: Pengkomputeran Awan Mudah Alih, pengguna, peranti mudah alih

ABSTRAK

Baru-baru ini, peranti mudah alih telah menjadi alat yang diperlukan dalam kehidupan kita dan bilangan orang yang mempunyai peranti mudah alih semakin meningkat. Peranti mudah alih mempunyai banyak ciri, seperti panggilan, mesej, gambar tangkapan, melayari internet dan sebagainya. Sementara itu, Pengkomputeran Awan Mudah Alih (PKS) merupakan kemunculan pembangunan teknologi berasaskan Internet yang banyak, yang membolehkan pengguna mudah alih mendapat kelebihan pengkomputeran awan dan mencapai pengkomputeran hijau dengan menggunakan peranti mudah alih mereka. Objektif utama penyelidikan dalam kajian ini adalah untuk mengenal pasti faktor-faktor yang mempengaruhi penggunaan Pengkomputeran Awan Mudah Alih di kalangan pengguna peranti mudah alih di Melaka. Data kajian ini akan dikumpul dengan menggunakan soal selidik dari 384 responden di Melaka. Faktor-faktor yang mempengaruhi penggunaan Pengkomputeran Awan Mudah Alih (PKS) di kalangan para pengguna di Melaka termasuk kemudahan penggunaan, keutuhan yang dianggarkan, keselamatan yang dirasakan, keperluan kegunaan dan kualiti perkhidmatan dan sistem. Kemudahan penggunaan, keutuhan yang dianggarkan, keperluan kegunaan dan kualiti perkhidmatan dan sistem adalah penting kepada faktor-faktor yang mempengaruhi penggunaan Pengkomputeran Awan Mudah Alih. Keputusan kajian ini menyumbangkan kepada pemahaman yang dalam kepada pengguna peranti mudah alih dan pemaju Pengkomputeran Awan Mudah Alih di Malaysia.

Kata Kunci: E-dagang, pemasaran digital, keputusan selepas pembelian

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LIST OF ABBREVIATIONS AND SYMBOL

ABBREVIATIONS	MEANING
MCC	Mobile Cloud Computing
ANOVA	Analysis of Variance
IV	Independent Variable
DV	Dependent Variable
PEOU	Perceived Ease of Use
PU	Perceived usefulness
PS	Perceived Security
PC	Perceived Connectedness
SSQ	Service and System Quality
H ₀	Null Hypothesis
H ₁	Alternative Hypothesis
SPSS	Statistical Packages for the Social Science

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CHAPTER 1

INTRODUCTION

1.0 Introduction

This research is to identify the factors affecting adoption of Mobile Cloud Computing (MCC) among the users in Malacca. The basic concept of the study and the significance of the topic is discussed in this chapter. The research background is the first part of the thesis discussed and follow by the problem statement. The research questions and research objectives will be discussed and set. This is continued by describing the scope and the key assumption of the study, limitations, and significance of the study.

1.1 Background of the Study

Mobile devices can be a term dedicated to smartphones or tablets. Mobile devices have many features, such as call, message, capture photo, surf internet and so on. Normally, a mobile device will have a LCD flat screen interface with the touchscreen function and have various connection option. Recently, mobile devices have become a necessary gadget in our life and the numbers of people having mobile devices are on the rise. One people may have few mobile devices.

Mobile Cloud Computing (MCC) is a merge of mobile device and cloud computing. The users can use the mobile devices to access the proverbial ‘cloud’ and this mobile-centered approach has become an increasingly larger part of the cloud construct (Warner and Karman, 2010). According to Kim & Kim (2016), mobile cloud computing is an emerging cloud service model and it is part of a larger trend in which the cloud has been extended to the edges of networks. Many mobile devices can access to the cloud, and these devices are closely related with their users. Mobile devices have unique attributes in providing services to consumers.

Mobile cloud computing (MCC) is an emergence of multiple Internet-based technologies development. Its enable mobile users to have the benefits of cloud computing and green computing is accomplished by using their mobile devices (Gai et al., 2016). The research location set in Malacca because Malacca is a city that going to be green and MCC is related with green. Malacca set a vision to become a green technology city state by the year 2020.

The purpose of this study is to find out the factors that affect mobile devices users use mobile cloud computing. The factors that impact the mobile cloud computing are very important because is it to ensure the successful of mobile cloud computing adoption.

1.2 Problem statement

Nowadays, the features of the mobile device getting more and more. The number of mobile devices used increased and the user of mobile devices also increased. Own a mobile device can be said is becoming necessary. According to the Nielsen Mobile Shopping (2016), whilst the mobile device is seen as an indispensable shopping companion among Malaysian consumers, other top uses of the mobile device include social media (78%), accessing emails (73%), viewing YouTube (63%), checking a bank account balance or a recent transaction (53%) and playing free games (52%). Xiao & Zhang (2013) stated that the data sharing and storage are difficult for these devices. This is because of the data inflation and mobile device’s limitations,

such as capability of computing and limited storage space. When the mobile device's storage is full, it will cause the mobile device's performance slow down. Mobile device data security is important because mobile device can use to do payment and transfer money with the mobile wallet apps and banking apps. The most common protection mechanism of the mobile device is password based protection, others can see and remember the password and later the unauthorized user attacker can use the password that he/she seen to get into the secured data (Sujithra et al., 2014). Therefore, Mobile Cloud Computing is suggested to be adopted to solve the problems.

1.3 Research questions

- I. What are the factors of mobile devices users in Malacca use mobile cloud computing?
- II. What are the benefits of mobile devices users in Malacca use mobile cloud computing?
- III. What is the way of mobile devices users in Malacca store their data?

1.4 Research objectives

- I. To determine the factors of users in Malacca use mobile cloud computing.
- II. To identify the most influence factor of users in Malacca use mobile cloud computing.
- III. To justify the way of mobile devices users in Malacca store their data.

1.5 Scope and Key Assumptions of the study

The scope of this study is to find out the factors affecting adoption of Mobile Cloud Computing (MCC) among the mobile devices users in Malacca. The factors that

affect the Mobile Cloud Computing are perceived ease of use, perceived connectedness, perceived security, perceived usefulness, service and system quality. The quantitative method will use in this study and quantitative method is a survey questionnaire to collect data. The survey questionnaire will distribute to residents in Malacca that own mobile device. About 384 respondents in Malacca was targeting to answer the questionnaire.

1.6 Limitations of study

The researcher has met some limitations during the process of completing this study. The researcher lack of experience in conducting the questionnaire and analysis data. The researcher needs more guiding from supervisor to complete this study. The researcher found out that the information of the research topic to complete the study is not easy to get. Besides that, the researcher assumes the respondents answer the questionnaire honestly.

1.7 Significance of the study

The main objective of the researcher in this study is to identify the factors that affecting adoption of Mobile Cloud Computing (MCC) among the mobile devices users in Malacca. In this study, the researcher has a chance to gain more knowledge in Mobile Cloud Computing and gain more experience in conducting the research.

1.8 Structure of Thesis

Chapter	Brief Description
Chapter 1	This chapter is mainly discussed about the basic concept and background of the study, problem statement, research objectives, research questions, research hypotheses, scope and key assumptions of the study, limitations of study and significance of the study.
Chapter 2	In this chapter, the literature review described with the definition of the topic. The theoretical framework of this research also includes in this chapter.
Chapter 3	In this chapter, the researcher describes the research methods and explains the research method that chosen to conduct the research.
Chapter 4	This chapter is to test all the hypotheses that have been developed by using Statistical Package for the Social Sciences (SPSS). It is mainly to test the reliability, the validity of the data collected and he relationship between dependent variable and independent variables.
Chapter 5	This is the last chapter. The researcher will summarize the overall analysis, results, and conclusion in this chapter. The researcher will describe the key findings to support the research objectives and hypotheses, limitation of study, recommendations and conclusion.

1.9 Summary

In this chapter, the background of Mobile Cloud Computing, problem statement, research questions, research objectives, research hypotheses, scope and key assumptions of the study, limitation of study, and significance of study have been described by the researcher. The literature review of the study will be discussed in next chapter.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

This chapter will continue with the discussion of literature review that obtained from the journals, articles and books and aimed to build a theoretical framework. The researcher will determine the factors that affect adoption of Mobile Cloud Computing among the mobile device users.

2.1 Definition of terms

2.1.1 Mobile device

The mobile device is a portable computing device or a handheld computer such as tablet or smartphone which is a user can easily carry with them. Mobile devices can used at anywhere, anytime and any situation and when compared to the desktop computers, mobile devices have smaller screens and different input options (Sommer et al., 2017). The different of a tablet with a smartphone is tablet has a bigger screen and heavier weight than a smartphone. Basically, it almost has the same function with smartphone and it can't use to make a phone call. Basically, a smartphone is in pocketed size and its function not only can make voice call and video call. With the application that installs in smartphone, smartphone can use to do online banking, payment and so on. Every mobile device has an operating system (OS). Operating

system is a software that allows mobile devices to run the applications and programs and the most common type of operating system (OS) that mobile device has is Android, iOS and Window.

2.1.2 Mobile cloud computing

The merge of mobile Internet, cloud computing and mobile computing is the conceptual architecture of Mobile Cloud Computing. Mobile users can offload data processing and storage on to clouds through wireless networks and mobile devices (Gai et al., 2016). Mobile cloud computing is using the cloud computing to deliver applications to mobile devices. According to Gope & Das (2017), mobile cloud applications shift the power of computing and data storage away from the mobile phone and into the cloud, which not only brings applications and mobile computing to the smartphone users but much boarder range of mobile subscribers. Nowadays, there have lots of good examples of applications of Mobile Cloud Computing, such as Gmail, Outlook, Google Drive, iCloud and others. Besides that, mobile cloud computing supports many applications including mobile banking, mobile healthcare, mobile learning and other areas.

2.1.3 Perceived ease of use

Perceived ease of use is like effort expectancy in Unified Theory of Acceptance and Use of Technology Model (UTAUT). Davis (1989) stated that perceived ease of use is the degree to which a person believes that using a particular system would be free from effort. If the complexity of the technology is high, the rate of users adopts the technology is low. Applications that are considered easier to use than others are more likely to be accepted by users (Davis, 1989).

2.1.4 Perceived usefulness

Perceived usefulness is like the performance expectancy in Unified Theory of Acceptance and Use of Technology Model (UTAUT). According to Davis (1989), perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" and the word "useful" is defined as "capable of being used advantageously".

One of the key advantages of mobile cloud computing is larger storage capacity. Every mobile device has the built-in storage and the built-in storage can't expandable. When the storage is fully utilized, the performance of the mobile device will become low. Google Drive and iCloud are the well-known examples of the mobile cloud computing service. Online storage with large capabilities that provided by Apple's iCloud service let the users can access their data via desktop computers, smartphones, tablets and portable media players (Dihal et al., 2013). Through mobile cloud computing, there is a significantly enlarge the data storage capacity of mobile devices and therefore the data management is became more convenient and synchronization in a ubiquitous online workspace (Park & Kim, 2014).

2.1.5 Perceived security

According to Shin (2010); Yenisey et al. (2005) as cited in Park & Kim (2014) defined perceived security as "the degree of users believes in the security of a particular service" and proved that it plays a key role in determining user attitude toward and perceived usefulness of online services. Besides that, perceived security can be said almost has the similar psychological effects on the ways in which users adopt and use the mobile cloud computing.

The most basic and common protection mechanism of the mobile device is password lock and pattern. If the password and pattern saw by others, others can access the mobile device and steal the data without permission. Mobile devices are typically used in a variety of locations, such as shopping malls, restaurants, homes, motels, and

conferences and the device's mobile nature makes them much more likely to be lost or stolen than other devices, so their data is at increased the compromise risk (Souppaya & Scarfone, 2013). To protect the data of the mobile device, the solutions are invented to solve the security problems and avoid illegal content distribution via mobile cloud services (Kim & Kim, 2016). Majority of the mobile cloud service providers have their own backup and security systems to protect and keep the data of user. By using mobile cloud computing to save files is a valid way to enhance reliability and decrease the risk of loss of data.

2.1.6 Perceived connectedness

Shin (2010) as cited in Park & Kim (2014) stated that users tend to share and communicate with others in collaborative environments through a particular system and users' feelings of perceived connectedness are the degrees to which they believe that they are cognitively connected with the network, its people, and its resources. For example, users maybe prefer to communicate with others through a virtual system rather than actually meeting a person because of their physical and locational convenience. Similarly, users can get more positive feeling of connectedness in virtual reality through mobile cloud computing.

With mobile cloud computing, the real-time data can be accessed at anywhere and anytime and can access by multiple people, as long as the internet is connected. In mobile cloud computing, as the name itself suggests, data that would traditionally be only accessible only to the mobile device's owner, would now be stored on, accessible to, shared with external devices or users (Fernando et al., 2013).

2.1.7 Service and system quality

System quality is defined as a "user's belief about the performance characteristics of a cloud storage system (Chiu et al., 2007, p. 274 cited in Burda &