ASSESSING CLOUD COMPUTING SECURITY LEVEL OF AWARENESS AMONG IT AND NON IT STUDENTS IN UTM

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ASSESSING CLOUD COMPUTING SECURITY LEVEL OF AWARENESS AMONG IT AND NON IT STUDENTS IN UTM

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Alhamdulillah… thank you to Allah. Because of Him, I manage to reach at this level. I lovingly dedicate this project to my beloved family, especially to my wife and daughter for instilling me the importance of hard work and higher education.

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ABSTRACT

The cloud computing service is a new paradigm for providing storage and application on demand by using internet. While clouds computing becoming one of the most growing services in information technology, people have expressed apprehensions regarding security aspects of this new model. However, the procedural and technical procedures on this service success is depends on users awareness about the security risk and their relations with the knowledge on it. In this research, issues in security awareness as an effect of user's education background were being investigated. These issues cover three equivalent dimension namely behavior, attitude and knowledge regarding cloud service security. Each one of these dimensions was then subdivided into the three focus areas in cloud service usability, internet security and physical security. The data gathering is done by using questionnaire, involving three different faculty students as respondents, which are Faculty of Computing, Faculty of Education and Faculty of Bioscience and Medical Engineering. The technical expertise dimension is then divided into IT-related background in Faculty of Computing and non-IT related background in Faculty of Educations and Faculty Bioscience and Medical Engineering. This research involved 119 students from these three faculties. Results show a significant impact on cloud service usability and security knowledge on IT related background students. However, the total level awareness of IT related background are considered equal to non-IT related background students while their lower attitude on the security awareness tends to neglecting their knowledge to the impact of their unsecure behavior.

ABSTRAK

Perkhidmatan komputeran awan adalah paradigma baru untuk menyediakan tempat menyimpan dan applikasi atas permintaan dengan menggunakan internet. Walaupun komputeran awan telah menjadi perkhidmatan teknologi maklumat yang berkembang, orang ramai masih menyuarakan kebimbangan mereka berhubung dengan aspek-aspek keselamatan model baru ini. Bagaimanapun, prosedur dan prosedur teknikal pada perkhidmatan ini bergantung kepada kesedaran pengguna pada risiko keselamatan dan hubungannya dengan pengetahuan tersebut. Dalam kajian ini, isu-isu kesedaran keselamatan dari kesan latar belakang pendidikan dikaji. Isu-isu ini meliputi tiga dimensi bersamaan terutamanya tingkah laku, sikap dan ilmu pengetahuan yang berkaitan dengan perkhidmatan keselamatan awan. Setiap satu dimensi-dimensi ini dibahagikan kepada tiga bidang tumpuan di dalam kebolehgunaan perkhidmatan awan, keselamatan internet dan keselamatan fizikal. Pengumpulan data dilakukan dengan menggunakan soal selidik, yang melibatkan tiga fakulti yang berlainan sebagai responden, iaitu Fakulti Komputeran, Fakulti Pendidikan, dan Fakulti Biosains dan Kejuruteraan Perubatan. Dimensi kepakaran teknikal pula dibahagikan kepada latar belakang IT dalam Fakulti Komputeran dan tiada latar belakang IT dalam Fakulti Pendidikan dan Fakulti Biosains dan Kejuruteraan Perubatan. Kajian ini melibatkan 119 pelajar dari tiga-tiga fakulti ini. Keputusan menunjukkan terdapat kesan yang besar pada kebolehgunaan perkhidmatan awan dan pengetahuan keselamatan pada pelajar berlatar belakang IT. Akan tetapi, jumlah kesedaran daripada latar belakang IT dianggap setara dengan pelajar yang tiada berlatar belakang IT manakala sikap yang lebih tidak peka mereka terhadap kesedaran keselamatan lebih cenderung kepada mengabaikan pengetahuan mereka akan kesan dari tingkah laku yang tidak terjamin.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Cloud computing is a service that enables network access to the common set of configurable computing resources such as storage, servers, application and networks are made simpler to use. Easily provisioned services requiring less involvement from the management are also featured in cloud computing (Mell and Grance, 2011). Therefore, the main element in the cloud computing technology is the internet. With the use of internet, the technology of cloud computing can provide range of services to many people and organizations.

In current practice, cloud computing is one of the segments which are expanding rapidly. The cloud computing has shown a noticeable progress in the past few years from being a mere business concept to a complete business solution. Many organizations are trying to take advantages of cloud computing technology and allowing them to increase their resources and access of the best business applications with cost effective (Yang and Chen, 2010).

Customers are becoming well aware of the advantages of cloud computing. The advantages of cloud computing have led to a rise in the end users. They are able to handle their IT resources in an economical manner due to the flexibility and the many options available in cloud computing. For instance, they are able to find a file

that was lost due to computer crash. Files are saved automatically after several seconds for online office programs and it can also be brought back to its original condition. So users can benefit as they can move back to the past file version through cloud file storage services. Therefore, documents can be easily saved without the need to understand the details of the program being used.

While clouds computing becoming one of the most growing services in information technology, people have expressed apprehensions regarding security aspects of this new model being adapted (Zissis and Lekkas, 2012). The major problem that the organizations and users are facing in the use of cloud is related to security concerns of moving confidential data to public clouds. The fact that the cloud providers do not guarantee the data security on public clouds discourages the users to put their data on clouds (Antonopoulos and Gillam, 2010).

Cloud computing should have significance security awareness and this is necessary requirement for organization and their users. Information security management involves procedural and technical regulations that protect information assets with respect to confidentiality, integrity and availability. However, many of these regulations are not successful when users done security-negative and do not aware about the risk of their current insecure behaviour. Thus, the behaviour, user's attitude should be aware based on their and their knowledge on cloud computing security.

In this research, issues in security awareness as an effect of user's education background were being investigated. These issues cover three dimension perspectives of security awareness. They are the behaviour, attitude and knowledge of cloud services. The study focuses were focused on IT-related and non-IT related background study within the same institutions. This research was aimed to answer the suitable recommendation of cloud services utilization on the institution based on the user's study background.

1.2 Problem Background

Cloud computing has been utilized by numerous users to work with their resources. Through cloud computing, an organization works on improvement provision by standardization of the IT infrastructure and enhancement of the efficiency in technologies being used (Shin, 2013). The internet usage by users gives the ability to access the database and even work on specific computing processes with a high-speed network. Thus, the technology of cloud computing is increasingly being used by various public sectors as the spread of this service has grown quickly (Jaeger *et al.*, 2008).

While the fact that the technology is considerably potent and promising, there are substantial risks concerning the information security and privacy. The International Data Corporation conducted a survey, which revealed that security issues are the main concern in terms of the usage of the cloud computing service. The survey shows that 75 percent of responders are worried about security issues (Marshall, 2009).

The complete and clear rules for security are recommended to prevent the security issues. Users could familiarize themselves through rules and it could facilitate their feeling to be protected, ensuring trust when using cloud computing services. This could be seen in privacy right of Google Docs by restricting the personal data utilization by Google and the place of resided or saved data (Svantesson and Clarke, 2010).

In the application as services, cloud computing works by using internet infrastructures where users do not know the exact location of the infrastructure. Facebook, Dropbox, YouTube, Gmail, and Microsoft Hotmail are examples of cloud services. There are many more cloud services, with most of them being free services.

When people are not aware about security risks and threats associated with their environment, they are simple way to give attackers the chances to gain access to their resources or system. Users can cause open back door and they are potential vulnerable gateway in abusing an information system. For instance, cybercrime, data breaches, identity theft, fishing and more of modern threats out from human mistakes (Dodge Jr *et al.*, 2007).

Although users do not have knowledge about dangers of their wrong actions, they still even if they have some knowledge deliberately or accidentally neglect or do not respect security guidelines and policies (Stewart and Kennedy, 2009).

1.3 Problem Statement

As mentioned in the problem background, the most common barrier of the cloud computing implementation is security issue. The security issue in human computer interaction cannot be released by the user behavior in using the cloud computing solutions. One of the main factors which shape the behavior is the user knowledge.

In many research results, the knowledgeable user could implements the security good practice better than the non-knowledgeable user. The impact of user with IT-related background in correlation with their behavior is important to describe the security awareness in cloud computing.

The analysis of user behavior with different IT-knowledge background could produce a good practice in developing, implementing and maintaining the cloud computing application in such organization.

1.4 Project Aim

The aim of this project is to investigate the level of cloud computing security awareness at Universiti Teknologi Malaysia (UTM) students as end users of cloud applications based on their IT-education background. A good practice recommendation are proposed based on the user's security behavior in cloud computing services

1.5 Project Objectives

In this project, there are three objectives that need to be achieved in this project. There are as follows:

i. To study the levels of cloud computing security awareness to the students of UTM as cloud application end users.

ii. To analyze differences between IT-education backgrounds and non-IT education background on user behavior related to the security of cloud computing as a service.

iii. To propose the recommended factors to enhance the level of security awareness regarding to the use of cloud computing as a service for the adoption of future in UTM for both students and institutions.

1.6 Project Scope

The scope of project defined as follows:

i. The study will focus on UTM as a target organization.

ii. The students of UTM from three (3) different faculties are the target respondents. These faculties are Faculty of Computing, Faculty of Education and Faculty of Biomedical and Health Science.

iii. End users will be IT-related studies and non IT-related studies students.

iv. The questionnaires for survey will assess the sample of students with contents focus in cloud computing security areas and common issues based on the literature review.

v. The questionnaires will examine attitude, behavior and knowledge of students.

vi. The type of service in the cloud computing will be the Software –as –a -Service (SaaS) for both public and UTM private services.

1.7 Significance of Study

There are many studies focus on security and privacy areas of cloud computing for organizations (Chakraborty *et al.*, 2010; Chow *et al.*, 2009; Grobauer *et al.*, 2011). But a few studies have discussed into end-users' security perceptions. One of the main factors of user perception is the user knowledge. There is a little studies about the users knowledge and its relation to their behavior and attitude when they are using the cloud services (Ion *et al.*, 2011). This project will investigate the level of cloud computing security awareness from different background students with the relation of their behavior in UTM. The correlation between IT-related background and their security awareness level in cloud application could ensure the

effectiveness of cloud application.

Security awareness is important for each user that uses the cloud computing services. This study will reveal areas of awareness weakness and strengths for end users. It will give clear pictures of UTM student's current level on every security awareness dimension for cloud computing. The findings of this study are to identify the most common security issues related to the end users of cloud computing services and support the authority to determine the focus awareness areas to reduce security threats when using cloud computing services. Moreover, this research could help the regulator to develop or improve the existing policies and procedures especially in UTM. Good practice recommendations were proposed based on research results on user's security awareness in cloud computing services

1.8 Project Organization

This project consists of six chapters. Chapter 1 includes an introduction to the project, comprising of problem background, problem statement, aim of project, objectives, in addition to scope and significance of this project. Chapter 2 presents a review of the literature in main areas of relevant theories in cloud computing security awareness. Chapter 3 discusses the research method that will adapt for this project. Chapter 4 presents initial results of questionnaire. Chapter 5 provides the analysis and result of research and summary of cloud service among students. Chapter six is the last chapters which contain conclusion and recommendation of researches.

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