Faculty of Information and Communication Technology

IDENTIFY HUMAN ERROR IN USING MOBILE DEVICE THAT LEAD TO SECURITY THREAT

Norzul Masri Binti Abdul Mubin

Master Of Computer Science (Security Science)

2017

HUMAN ERROR IN USING MOBILE DEVICE THAT LEAD TO SECURITY THREAT

NORZUL MASRI BINTI ABDUL MUBIN

A thesis submitted
in fulfillment of the requirements for the degree of Master of Computer Science
(Security Science)

Faculty of Information and Communication Technology

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2017

DECLARATION

I declare that this thesis entitled “Identify Human Error in using Mobile Device That Lead to Security Threat” is the result of my own research except as cited in the references. The thesis “Identify Human Error in using Mobile Device That Lead to Security Threat” has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

Signature : ……..

Name : Norzul Masri Binti Abdul Mubin

Date : ……..……

APPROVAL

I hereby declare that I have read this thesis "Identify Human Error in using Mobile Device That Lead to Security Threat" and in my opinion this thesis "Identify Human Error in using Mobile Device That Lead to Security Threat" is sufficient in term of scope and quality for the award of Master of Computer Science (Security Science).

Signature : ……..

Supervisor Name :Assoc. Prof. Dr. Abdul Samad bin Shibghatullah

Date : ……..……

DEDICATION

To my beloved father and mother

(Mr.Abdul Mubin Bin Ishak & Mdm Zainab Binti Salleh)

ABSTRACT

Human errors are the most critical issues that contributes to the information security threat. Mobile device are the main devices that can be manipulates by the attacker towards their victims. The attackers nowadays more interested in attacking the mobile devices because of the current trend which the users used their mobile devices to perform all their daily task and stores their data inside the mobile devices. Users always think that it would be easier to stores all the information inside their mobile devices but did not concern the risk of their actions. This research are used to identify the human errors in using mobile device that contributes to the information security threat. The first part of this reports will identify and discuss in details of the common human errors from the previous research result and also the possible attack related to the errors perform. The second part will explain about the research process in details such as the method that will be used to perform the research, the research objective, research scope and goals and many more. The questionnaires are the method used to collect all the data from the user to identify the most common human error in using mobile devices. The guidelines from other researcher are also identify in this research to ensure that the new guideline proposed are the best practice guidelines that can be used by all users. The comparison between the literature review, questionnaires and the previous guidelines are the used to design the new guidelines. The research will be proposed a best practice security guidelines that applicable for the mobile device user to reduce and minimize the risk of become the victims of the cybercrime.

ABSTRAK

Kesalahan manusia adalah isu paling penting yang menyumbang kepada ancaman keselamatan maklumat. Peranti mudah alih adalah sebab utama yang membolehkan penyerang memanipulasi mangsa mereka. Penyerang kini lebih berminat menyerang peranti mudah alih kerana trend masa kini yang semakin popular dimana pengguna menggunakan peranti mudah alih mereka untuk melaksanakan semua tugas harian mereka dan menyimpan data mereka di dalam peranti mudah alih. Pengguna sentiasa berfikir bahawa lebih mudah menyimpan semua maklumat di dalam peranti mudah alih mereka tanpa memikirkan risiko tindakan mereka. Kajian ini digunakan untuk mengenal pasti kesilapan manusia dalam menggunakan peranti mudah alih yang menyumbang kepada ancaman keselamatan maklumat. Bahagian pertama laporan ini akan mengenal pasti dan membincangkan secara terperinci kesilapan manusia berdasarkan hasil penyelidikan sebelumnya dan juga serangan yang mungkin berkait dengan kesalahan yang dilakukan. Bahagian kedua akan menerangkan mengenai proses penyelidikan secara terperinci seperti kaedah yang akan digunakan untuk melaksanakan penyelidikan, objektif penyelidikan, skop penyelidikan serta matlamat dan banyak lagi. Soal selidik adalah kaedah yang digunakan untuk mengumpulkan semua data dari pengguna untuk mengenal pasti kesilapan manusia yang sering dilakukan dalam menggunakan peranti mudah alih. Garis panduan daripada penyelidik lain juga digunakan untuk mengenal pasti dan memastikan garis panduan baru yang dicadangkan adalah garis panduan amalan terbaik yang boleh digunakan oleh semua pengguna. Perbandingan antara kajian literatur, soal selidik dan panduan terdahulu adalah yang digunakan untuk merekabentuk garis panduan baru. Penyelidikan ini akan mencadangkan garis panduan keselamatan amalan terbaik yang sesuai untuk pengguna peranti mudah alih untuk mengurangkan dan meminimumkan risiko menjadi mangsa jenayah siber.

ACKNOWLEDGEMENTS

First and foremost I would like to thank to my supervisor, Assoc. Prof. Dr. Abdul Samad bin Shibghatullah that amazingly supervised me through this dissertation. His patience and support helped me overcome many crisis situations and finish this dissertation successfully. Thank you prof. for always help me whenever my step faltered, guiding me and taught me everything about life. And I am also thankful to my evaluators Dr. Siti Rahayu Binti Selamat and Dr. Robiah Binti Yusof that helping me with knowledge for my dissertation.

A special gratitude and love to my family and friends for their unfailing support. For my father and mother, Abdul Mubin Bin Ishak, Zainab Binti Salleh , my family members Ida izamawati, Zulherni,Zulkifli,Mohd Zulhakimi, Zul Luqman NurHakim and Mohd Farizal Mohd Nor and all my friends in KYM, thank you for your moral support and abiding love. To all, thank you.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

1.1 Introduction

This chapter are discussed the overview of overall research study which can be classify as the introduction of the research study. It contains the background of study which explain about the research study as a whole. It is used to give the understanding of the research perform and it also can be used as the summary of the research study. The next are the problem statement which explain the importance of conducting the research and continue with the objective of study. The objective will be the main focus of the research because it will determine either the research are successful or not.

In order to make sure that the objective are being achieve, the scope of study are also determine in this chapter. The scope are important to make sure that the research are on the right track and it focus only on the objective of the research. The significance of findings and the expected finding are also listed to ensure that the research are useful to the others. The next part are the report organization which show the chapter contains for the whole research and finally it contains the conclusion of this chapter which summarization of the chapter.

1.2 Background of Study

The definition of the “Human Error” are something has been done that was "not intended by the human; not desired by a set of rules or an external observer; or that led the task or system outside its acceptable limits". In short, it is a deviation from intention, expectation or desirability. Human error in information security are the biggest threat to the organizations. Simple mistakes like connecting computers to the Internet through an insecure wireless network may cause thousands dollar lost to the organizations.

According to (Thomson Reuters, 2012)., they concluded in its 2012 HIMSS Analytics Report that "*human error remains the greatest threat to data security across the healthcare industry*," and according to (Ponemon Institute© Research Report, 2012), The Human Factor in Data Protection, at least 78% of respondents indicated that their company had experienced a data security breach as a result of human negligence or maliciousness.

Therefore, this research will be conducted based from the human error through mobile devices in information security. This research will conducted in three main part which the first part are regarding the literature reviews, the second part are designing and conducting the survey and the analyzing all the findings from the surveys. The questionnaires will be design based from the previous research that have been done to simplify and identified the common human error made by employee. Besides that, the questionnaires also will be design to include the elements that help the respondents to understand and realize the impact of their actions. Once completed, it will be posted online and the survey will involve the users that are using mobile devices as the respondent. The After collecting process, the findings result will be used for the next phase. The last part is to collect the propose guidelines from previous researchers. The previous guidelines will be compared with the questionnaires result to propose new guidelines that are suitable for the organizations. The results from the

literature review, result from the survey and the previous propose guidelines findings will be discussed and reported accordingly.

1.3 Research Problem

The Cybercrime is a fast-growing area of crime. Nowadays, the information are mostly stored in digital. The information are very valuable and the main reason to lure the attackers to attack the organizations. Thousands of money were spend by the organizations in order to protect their information. Regardless all the technology used by the organizations to secure their information, sometimes they still become the victims of the cyber-attack. The main factors that contribute to the attack are the human error and not the technology itself. Most of the users did not realize the impact of their mistakes and errors while using their mobile devices that help the attackers to have the chance to attack them. Just a simple mistakes made by the users are enough to put them at high level of security risk.

On top of that, the current information security research are only focusing on identifying the malware threat in the mobile devices and not much on the cause that contributes to the malware attack in mobile devices . Most researchers are discussing on securing the environment, the common malware behavior and how to know if they have been infected. Other than that, the research for malware in mobile devices environment are also very less. Lacking of study on human error in using mobile devices that contributes to the attacks that keep increasing nowadays. The summarization of the problem statements are shown in table 1.1.

Table 1.1: Summary of Research Problem

No	Research Problem(RP)
RP1	Lack of knowledge regarding the impact of their actions/errors using mobile devices.
RP2	Lack of study on human error in using mobile devices that contributes to the information security threat.

1.4 Research Questions

Based on the problem statement (RP1) given, there are three research questions (RQ) are constructed and shown in table 1.2. The research questions are used to help determine the research objective. The research problem are mapped to the research questions in order to understand and identify the purpose of the research.

Table 1.2: Summary of Research Question

RP	RQ	Research Questions (RQ)
RP1	RQ1	What are the possible mistakes or error when using mobile devices that can be done by users and cause the information security threat?
	RQ2	How to identify the common human errors in using mobile devices that cause the information security threat?
RP2	RQ3	How to help the users minimizing their human errors in using mobile devices to prevent their devices from the information security attack?

1.5 Research Objective

In order to solve the research question (RQ) that being identified in Section 1.4, three research objective (RO) are being derived as shown in table 1.3. Research objective will help to clarify the goal and the actual results of the research. It also help as a guideline and reference when it is needed.

Table 1.3: Summary of Research Objective

RP	RQ	RO	Research Objective (RO)
RP1	RQ1	RO1	To identify and analyze the common human errors in using mobile devices that cause the information security threat based from previous research.
	RQ2	RO2	To conduct a survey and collect the findings on human errors in using mobile devices that makes them vulnerable to the information security threat.
RP2	RQ3	RO3	To propose security best practice guidelines for minimizing human error in using mobile devices based on questionnaires and the previous research results.

1.6 Research Scope

The research scope identified for this research are as listed below:

1. The research will only focus on the human errors in mobile devices that will impact the users through the information security threat.
2. This research will also focus only for the 200 users and their errors while using their mobile devices that vulnerable to the information security threat.

1.7 Research Contribution

The results from the study can be used to help the users to identify the most common human errors in using mobile devices that can risk them to the information security threat. Besides, it also can help the users to know and understand the impact of their mistakes or error to their life. This will make them more responsible and aware of every actions made so that it would not triggered the error or mistakes that can exposed their information. The findings also can help the users to reduce the loss from cybercrime when there is no more vulnerabilities inside their mobile devices. Other than that, the result of the best practice guidelines can be used by the users to minimize the human error in using mobile devices to secure them from the threat. The relationship between the significance of findings and the research objective are shown in table 1.4.

Table 1.4: Summary of Research Contribution

RP	RQ	RO	Research Contribution
RP1	RQ1	RO1	Assist to identify the most common human errors in using mobile devices that makes them vulnerable to the information security threat.
	RQ2	RO2	Assist the users to know and understand the impact of their mistakes or error using mobile devices that might risk to their life.
RP2	RQ3	RO3	Help the users to reduce the loss from cybercrime when they are secure their own devices.
			Help the users to apply the best practice guidelines for the human error in using mobile devices in their life.

1.8 Research Expected Findings

The expected result are to design questionnaires that contains list of common human error in using mobile devices that lead to the information security threat. The list will help the users to identify the most common human errors that makes them vulnerable to the information security threat. Besides, it can assist the users to know and understand the impact of their mistakes or error to their mobile devices and their life.On the other hand, the survey result and findings on human errors that impact the users information security will also useful to help them to reduce the loss of cybercrime and help them to get an idea of minimizing the human error to secure their devices from the threat. Table 1.5 show the relation between expected findings with the research objective.

Table 1.5: Summary of Expected Findings

RP	**RQ**	**RO**	**Expected Findings**
RP1	RQ1	RO1	• Questionnaires that contains list of common human error in using mobile devices that lead to the information security threat. • Survey result and findings on human errors that impact the user information security.
	RQ2	RO2	
RP2	RQ3	RO3	• Security best practice guideline for human error in using mobile devices based on the survey results and previous research.