CHAPTER I

INTRODUCTION

1.1 Background

With the current advancement in modern technology, the interaction among people has become easier with the advancement in the mode of communication. A mobile phone (also known as cellular phone, cell phones, and hand phone) is a common device that people own these days and can connect them easily regardless of place and time as calls can be made through a radio link while moving around the geographical area and in places where connection can be made easily. Mobile phone was first demonstrated in the year 1973 by Motorola, a huge telecommunication company. With the convenience that have, telephone has become a mode of communication where people can send text messages, Multimedia Messaging Services, short range wireless communications such as infrared and Bluetooth, gaming, photography and many others useful services (Dunnewijk, and Hultén ,2007).

Mobile phones develops significantly, not only limited to transmitting and receiving calls, sending text messages and some other features, but also they offer many benefits and services in a compact device. Therefore with all these advantages, they cannot remain under what is so-called mobile phone. They are now best called smart phones, because they have features superior to traditional phones. The first appearance of

the smart phones were in 1993 where their features and services were limited to the requirements of companies and the actual launch of the first smart phone in the market was in 1997 by Apple (West and Mace ,2010). Apple distinguishes smart phones from traditional phones that the smart phone works as a traditional phone but smarter, a smart phone is considered a computer in your hands. Attributes smart phones provide mounted with an operating system as a set of commands and instructions that work together to manage the phone and various components such as the display, processor, camera, or in other words, it links the Hardware and Software that allow the user to utilize the phone operations, because the users choose to run what they want such as certain applications, games, the interface screen and everything inside the phone. Smart phones have better functional value in terms of the advancement, connections and also the features where the computers functions can be found on any smart phone these days. Latest and sophisticated smart phones can provide various types of services such as wireless network connectivity for example 3G, 4G, Wi-Fi and other services. Different applications can be installed in smart phones without having any restrictions. With the current available services, many transactions can be done such as banking, through wireless network, sending emails and messages and saving private and confidential messages.

Maintenance in terms of security and protecting important information is vital in case of theft or hacking information. Having reliable security system can help users to safe guard all data and it will also protect the phone from other major virus attack. By doing this, users will have better way of protecting all their confidential information and this will allow them to enjoy all services in a better way (Jeon et al., 2011).

1.1.1 **Time line of smartphone**

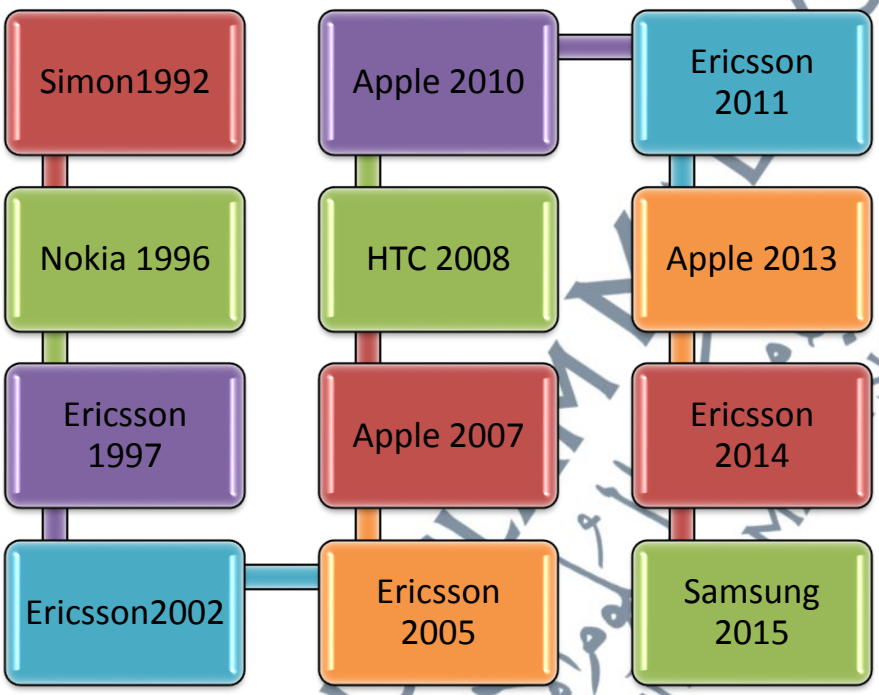

Figure 1.1 Time line of smart phones

As depicted from Figure 1.1, Simon Company released IBM phone in 1992, Simon phone can perform certain functions such as tabulator time, world time, e-mail and it was the only device that performs these tasks in the United States. In 1996, Nokia has launched a range of phones designed for businessmen. In 1997, Ericsson Company produced the first smart phone called Penelope and in 2000, the company has developed Penelope phone into Symbian phone, which operating system was working with touch-screen. From 2002 to 2005, Sony Ericsson smart phones dominated the international market over other smart phones, whereas, Sony has launched a smart multimedia phone. It was the

first Apple smart phone that has latest global sensation, Apple established IPhone Company in 2007. In 2008, the first smart phone with Android operating system was established from HTC. Apple in 2010 released the fourth version of iPhone. In 2011, apple filled the versions of smart phones from all the companies. Apple was the most important and one of the best phones produced. In 2013, in this year apple produced iPhone 5s which works with IOS 7 system and contains feature like fingerprint to open the phone. In 2014, Sony released a series of versions, Z to Z3 were water resistant feature. In March 2015, the latest Samsung phone version 6s was revealed.

1.1.2 Growth of Smart phones

Smart phones have become the most powerful and latest modern technology. Recently the number of smart phone users in all over the world increased quickly, where the number of users of smart phones has reached more than one billion people around the world. This situation has led to the ease of communication, any while the communication via smart phone improves the reception and communication using social sites. There are several types of Smart phones; examples of the most known smart phones are the iPhone manufactured by Apple and the Galaxy series by Samsung. A conflict arose between these companies including the production and modernization of the smart phone.

According to a report by Ericsson in 2013, global mobile device subscriptions will increase to 9.3 billion by 2019; the report also claims that out of the 9.3 billion subscriptions, smart phones will account for 5.6 billion, which is over 60% of the total of subscriptions. As shown in Figure 1.2, today, the majority of mobile subscriptions are for

basic phones. It was observed that subscriptions for these devices were on peak in 2012. However they will remain high, slowly declining from around 4.5 billion today, to around 3 billion in 2019. This is because a large part of growth in subscribers will come from the smart phone subscriptions. Total smart phone subscriptions had reach to 1.9 billion at the end of 2013 and it is expected to grow to 5.6 billion in 2019. One of the main reasons for this is because the subscribers change basic phones to smart phones in Asia Pacific, Middle East and Africa, and also due to the availability of these smart phones in lower price. In 2016, there will be smarter phone subscriptions globally than those for basic phones.

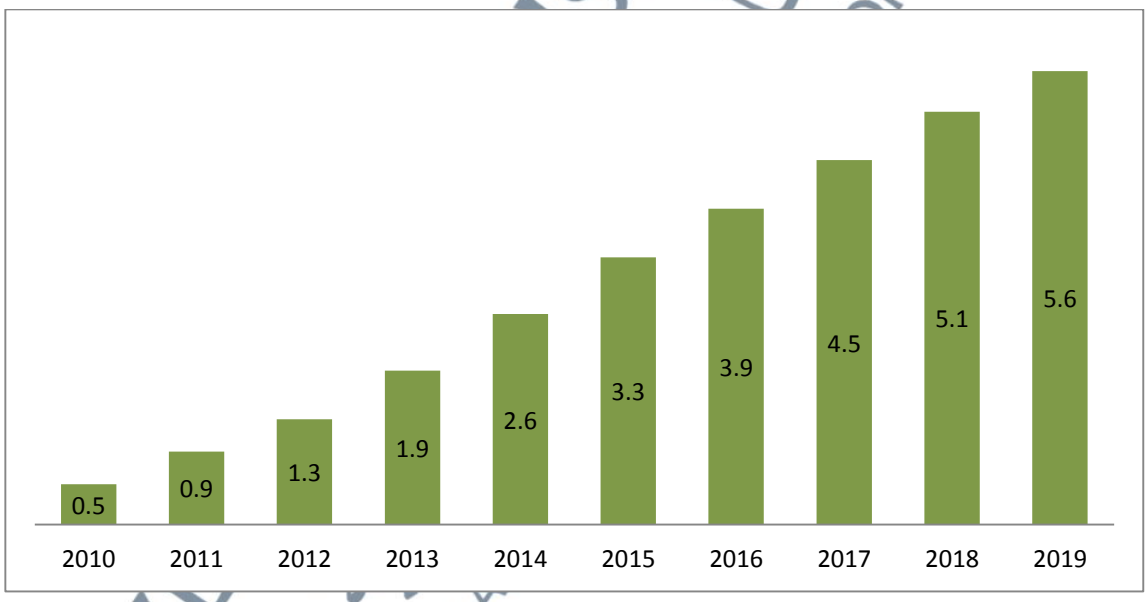

Figure 1.2 Smart phone subscriptions.

1.1.3 Risk and threat of using Smart phone

1.1.3.1 Threats of a smart phone

Smart phone is a gadget that can be used nowadays to accomplish many different tasks. Smart phone users are exposed to various threats when they use their phone. These threats can disrupt the operation of the smart phone and transmit or modify user data. Threats are usually potential danger that can be exposed in smart phone by people, professional thief or hackers, or something threatens to hardware or software, if they are not protected by some functional security in smart phones. Classification threats of smart phone are by two groups, first one threats caused by attackers such as malware who can alter or expose private information in smart phone, network attack and the attacker can corrupt, modify information on the wireless network, also can an attacker risk the availability of smart phone to take denial of service attack to wireless network and web server. Second one is the threats caused by user unawareness such as malfunction; the user can disable or malfunction application by mistake which results in the loss of important data from their smart phones (Jeon et al., 2011).

1.1.3.2 Risk of smart phone

Some users think that smart phones are just like normal phones to make phone calls, which is a wrong concept. That's because the amount of sensitive data store on phones is truly staggering. A smart phone provides direct access to information, data and checking accounts. What could happen if a thief gets his hands on all that data? This is

risk; the real risk is the lack of awareness of the danger that surrounds all aspects. Unawareness causes smart phone user of having risks of installing applications from unreliable sources, connecting to Wi-Fi networks, Bluetooth settings and browser settings. According to the report by (Giles and Dekker, 2010) the security of smart phones, some risks to the smart phone user are described below:

1- If the smart phone is stolen or lost and its memory is left unprotected, allowing an attacker access to the data stored on it.

2- Sometimes smart phone user unintentionally discloses data on the smart phone.

3- The smart phone allows an attacker of having access to the data on the phone.

4- An attacker collects all the data related for user (such as passwords and credit card numbers) by using fake programs or SMS, email).

5- Can installed smart phone spyware, where allowing an attacker to access or destroy change, personal data.

6- An attacker keeps a specific user under surveillance through the target user's smart phone.

7- An attacker steals money from the user by malware a program that makes hidden use SMS services or numbers.

8-The smart phone is infected with malware which is specifically designed for stealing credit card numbers.

1.1.4 Security functionality of smart phone

Security functionality for the context of this research is the method it used to protect the smart phone could be called functions because the main goal of this method is protect smart phone. The biggest security threats to smart phone are lost or stolen or leave the phone in public places. The best way to protect data after losing a phone is to not store sensitive information on it. If you want to store sensitive information on it, use a password on the phone and encrypt the data. Use a strong password that a stranger can't guess it. Advances in technology mean that smart phones can provide services and features similar to laptop computers. Smart phones usually support a wide range of functionality, web browsing, email, voice and instant messaging over the internet, capturing, storing and transmitting audio, videos and photos, enabling social networking, multi-user games, banking and many other activities. However, many of these tools and features introduce new security issues, or increase risks in existing issues. So smart phone must kept smart phones well-protected as it may have certain data or private and confidential messages that need special codes to protect the messages and details. Security functions in a smart phone are those functions related to the protection of smart phone in every aspect. These functions are password, data encryption and PIN. It works to protect data, information and SIM card. If it failed to protect the phone, it may cause to have the phones hacked by someone for wrong purpose. The risk in using smart phones in a wrong way may confuse someone, where they can download certain information which is large or with an unfamiliar trademark or not having any kind of knowledge in the security function and applications may risk the users. Such users must be completely

aware of the risk involved although they may enjoy some benefits in smart phones these days.

1.2 Problem statement

The number of phone users is increasing, as smart phones combine the advantages of traditional phones as well as the advantages of computer. But the information leakage and obstruction of business results in so-called cyber-attacks on networks. So there is a need to strengthen the awareness among users.

There are some users of smart phones who do not realize that they are at a risk of data loss and important information when they use their phones, because of theft or loss of most cases as malicious programs. Also the users don't have enough knowledge about how to deal with functions security on smart phone or how to protect their data from loss. So it may be caused by lack of user awareness in functioning security for their smart phone. As well as lack of awareness of how to deal with software and malware, which are threats on smart phones.

Related work:

Mobile phones have become common among large corporations, universities and all organizations in terms of usage. While there are many opportunities to increase the capacity and efficiency of the staff and workers in the various areas of concern, but the risk of attacking the privacy in the corporate world can limit these opportunities. In 2009,

the mobile phone users have exceeded four billion users with the availability of features and the functions available in smart phones, this makes it the best gadget available now (Frank and Claudia, 2010).

In the end of 2011, the number of subscribers for Communications International Union (CIU) surged with an estimate number of subscribers in the mobile phone service up to 5.9 billion subscribers which means that it is equivalent to 87% of the world's population. This gives us an indication that mobile phones have become very important these days and play an important role in daily living in every aspect (Mengiun, 2012).

A study by Furnell (2005) discusses more the Internet end-users in the United States. More than half of the respondents could not understand the differences between anti-virus and the fire-wall protection accurately, which resulted to almost 67% had no anti-virus software on their systems and 72% lacked an accurate configured firewall. Furnell study was conducted in the University of Ioannina on 454 respondents. In this survey, all respondents were students aged from 18 to 24 years with 53% of them men and 42% women. The level of concern toward awareness among men and women has revealed that women are more concern than men (59.8 % vs. 53.6 %).

To add more, students' majoring in science seems to feel more concern toward the application that a third person could know precisely when the users turn on or off their mobile phones. Statistical analysis showed that women seem to be more concern about this opportunity than men (55.7 % vs. 41.9 %). Iosif and Dimitrios (2008) in their study revealed the fact that a person can be deprived from the ability of using hand phones

(73.7 % vs. 62.5 %) in favor of women. Regarding the level of concern which likely occurs by interceptions kind of science, it is obvious that all students are aware of the fact that communicating through cell phones may not be safe. According to the statistical analysis of the results which were obtained from men, Men seem more secure than women (13.7 % vs. 3.1%).

1.3 Research Questions

1-What is the level of security functionality awareness among USIM students?

2-What are the factors affecting the level of awareness security functionality?

3- How security functionality factors affect the level of security awareness among students?

1.4 Research aim

The aim of this study is to propose a smart phone security functionality awareness model.

1.5 Objectives of research

In this project, the objectives that need to be achieved are as follows:

1. To identify the current level of awareness security functionality in smart phone security functionality.
2. To identify the relationship between the factors that might affect the level of awareness.
3. To design a model of smart phone security functionality awareness.

1.6 Hypotheses

Below are the hypotheses for this study. Details of the factors will be explained in chapter 2.

H1a. There is a positive relationship between age, gender and users' attitude toward smart phone security functionality.

H1b. There is a positive relationship between education level and users' attitude toward smart phone security functionality.

H1c. There is a positive relationship between the type of item or service and users' attitude toward smart phone security functionality.

H2a. There is a positive relationship between security system and users' behavior toward smart phone security functionality.

H2b. There is a positive relationship between the type of item or service and users' behavior toward smart phone security functionality.

H3a. There is a positive relationship between users' attitude and security knowledge toward smart phone security functionality.

H3b. There is a positive relationship between users' behavior and security knowledge toward smart phone security functionality.

H3c. There is a positive relationship between users' training and security knowledge toward smart phone security functionality.

H3d. There is a positive relationship between age, gender and security knowledge toward smart phone security functionality.

H3e. There is a positive relationship between education level and security knowledge toward smart phone security functionality.

H4a. There is a positive relationship between security knowledge and security functionality toward smart phone security functionality.

H4b. There is a positive relationship between authentication method and security functionality toward smart phone security functionality.

H5a. There is a positive relationship between security knowledge and level of awareness security functionality toward smart phone security functionality.

H5c. There is a positive relationship between users' attitude and level of awareness security functionality toward smart phone security functionality.

H5d. There is a positive relationship between users' behavior and the level of awareness security functionality toward smart phone security functionality.

H5e. There is a positive relationship between users' training and the level of awareness security functionality toward smart phone security functionality.

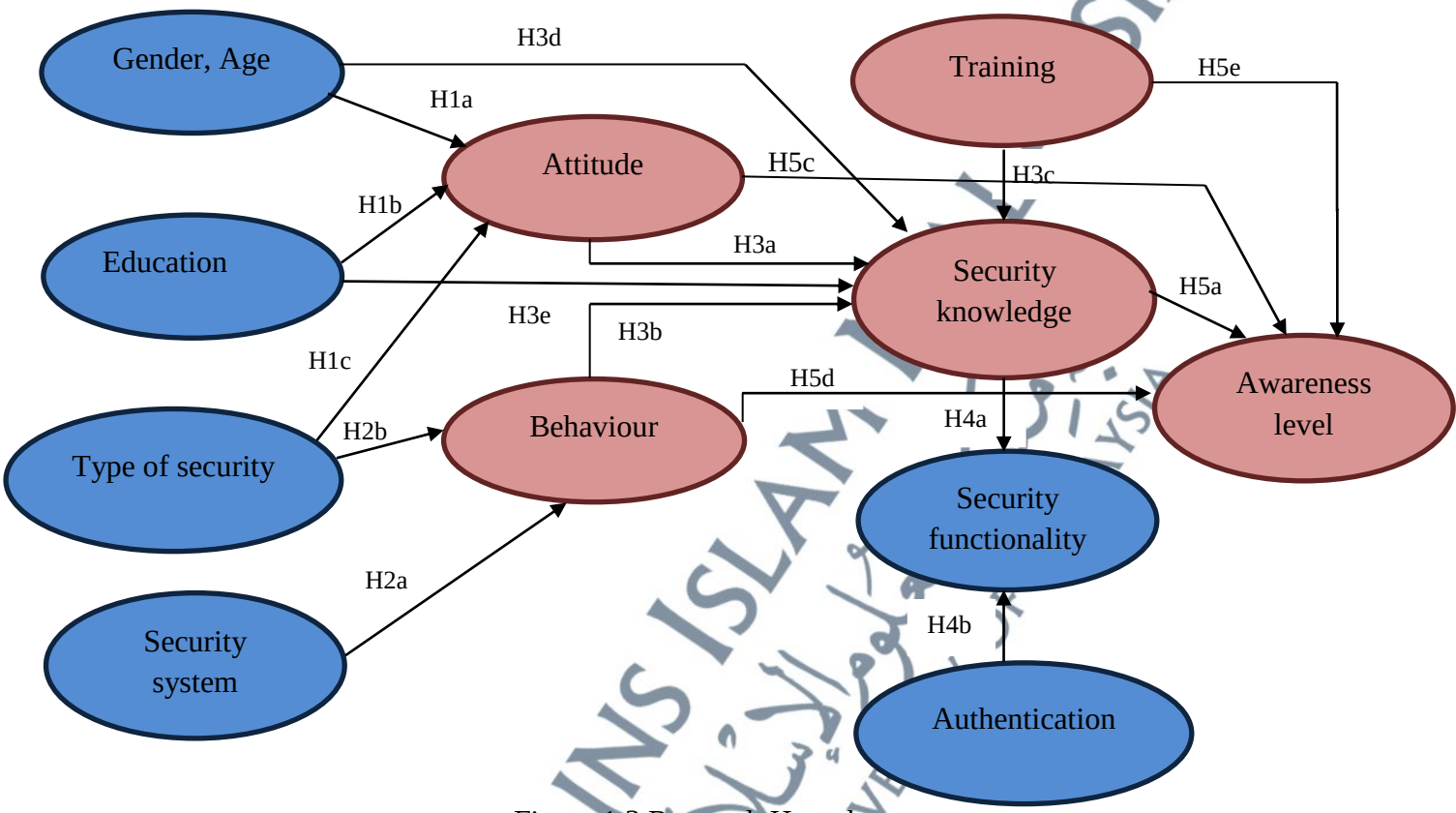

Figure 1.3 Research Hypotheses

1.7 Scope of the research

The scope of the project includes the following areas:

I. This study will focus on smart phone users.

II. The students of USIMs' are the respondents do USIMs' students represent youth.

III. Smart phone security functionality and the awareness among users.

IV. This study don't cover this study does not cover varieties students discipline.

1.8 Synopsis on methodology

The study was conducted by using quantitative approach. A survey was conducted to collect data from respondents. The population of USIM students is about 11000. The questionnaire has been distributed to approximately 500 students, and the returned usable response for this study is 375. The study sample is consists of different age groups (20-35 years old). Data were analyzed by using the SPSS to achieve the objectives of this study. The results contribute in designing a model of smart phone security functionality awareness. The details of the study methodology are shown in Table 1.1.

Table 1.1 Research methodology

Objectives	Approach	Data collection	Data analysis type
1-To identify the current level of awareness security functionality in smart phone security functionality	Quantitative	Questionnaire	Mean
2-To identify the relationship between the factors that might affect the level of awareness	Quantitative	Questionnaire	Correlations Analysis
3-To design a model of smart phone security functionality awareness	Study the factors	Literature review/ Questionnaire	Regression Analysis

1.9 Study outcome

This study revealed the factors and designed a smart phone security functionality awareness model.

1.10 Significance of the Study

This study is significant because the proposed model helps the users recognize the attributes in increasing their smartphone security functionality awareness. Furthermore the model gives insight to the smart phone manufacturer, by highlighting the factors that increase the level of awareness.

1.11 The structure of the thesis

The detailed organization of this thesis is described in the Table1.2 Structure of the thesis. Table 1.2 Structure of the thesis

CHAPTER	CONTENT
1 Introduction	This chapter consists of background research, the research problem, discussing the proposed model process, research questions and also the research objectives. This also derives the significance of the study and its methodology.
2 Literature review	Literature review is discussion the (Mobile security, Mobile security functionality, awareness security, awareness security smart phone, others factors).
3 Methodology	This chapter reports the methodology used in this study, this includes the research process (research method), data collection procedure, research instruments, as well as the data analysis.
4 Analyses data and results	The fourth section presents the analyses data, the findings of the study as well as the analyses of the results during the study process.
5 Conclusion	It is the final chapter which consist the main findings and future work to the study. Lastly, conclusion of the study closed this chapter.