DEVELOPMENT OF FORGET ME NOT ON ANDROID APPLICATION BY USING BLUETOOTH COMMUNICATION TO SECURING DIGITAL DATA IN UNIVERSAL SERIAL BUS (USB) DEVICES

Mohd Rahim Bin Ab Rahman

Bachelor of Mechatronics Engineering

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I hereby declare that I have read through this report entitle **"Development of a Forget Me Not (FMN) on android application by using Bluetooth communication to securing digital data in Universal Serial Bus (USB) devices"** and found that it has comply the partial fulfillment for awarding the degree of **Bachelor of Mechatronics Engineering with Honours.**

SIGNATURE : ....

SUPERVISOR'S NAME : **EN. ZAMANI BIN MD SANI**

DATE : **26 JUNE 2012**

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MOHD RAHIM BIN AB RAHMAN

A submitted in partial fulfillment of the requirements for the degree of Bachelor of Mechatronics Engineering with Honours

Faculty of Electrical Engineering
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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I declare that this report entitle **"Development of a Forget Me Not (FMN) on android application by using Bluetooth communication to securing digital data in Universal Serial Bus (USB) devices"** is the result of my own research except as cited in the references. The report has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

SIGNATURE   :   ……………………………..
NAME   :   **MOHD RAHIM BIN AB RAHMAN**
DATE   :   **26 JUNE 2012**

Special dedicated to my beloved family and friends

ABSTRACT

Nowadays, data storage is most importance for every person in the modern days. Data storage can be store in Universal Serial Bus (USB) device whether in external hard disk drive, thumb drive and etc. However the security level of the USB device cannot be guaranteed safe. The security level is including the ways how to secure the data and also to alert system the user when missing the USB device but only the alert system will be discuss in this project. Therefore, the security level is importantly to ensure the safety of the data storage from the intruder or from forgotten. The alert system of the USB device could be improved by using the USB alarm device. This USB alarm device that call as Forget Me Not (FMN) will integrate only with the Android operating system that can be prevent from losing or forgot the USB device when done use in the public area. The FMN can be applying to all USB devices such as Wireless USB Mouse, Wireless USB Presenter, USB Memory Card Reader and etc. The FMN will build in with the Bluetooth device that connects to the Android Smartphone using Android application to alert and remind the user to not forget. The application develop using the Eclipse software that base on the java programming and can be directly integrate with Android Software Development Kit (SDK) Manager software. In order to communicate, the Personal Computer (PC) interface together with USB device embedded with Bluetooth devices should be use. When the FMN user went out from the Bluetooth coverage, the application wills remind the user by using sound or vibration alarm depends to the user setting. From the alarm the user will know that USB device has been forgotten. The Bluetooth coverage for the open area is 48.14 meter and for close area is 17.24 meter. The FMN application is compatible with Android Smartphone which using platform 2.3 and above.

ABSTRAK

Pada masa kini, penyimpanan data merupakan salah satu kepentingan kepada setiap orang dalam dunia moden ini. Penyimpanan data boleh disimpan dalam peranti Universal Serial Bus (USB) sama ada dalam pemacu cakera keras, thumd drive dan sebagainya. Bagaimanapun tahap keselamatan peranti USB tidak terjamin. Tahap keselamatan ini termasuklah cara-cara untuk mendapatkan data dan juga untuk sistem amaran kepada pengguna apabila peranti USB hilang tetapi hanya sistem amaran dibincangkan dalam projek ini. Oleh itu, tahap keselamatan penting bagi memastikan keselamatan penyimpanan data daripada diceroboh atau lupa. Sistem amaran peranti USB boleh diperbaikkan dengan menggunakan peranti penggera USB. Peranti penggera USB yang dipanggil Forget Me Not (FMN) akan digabungkan hanya dengan sistem pengendalian Android yang boleh menghalang daripada peranti USB hilang atau terlupa apabila digunakan ditempat awam. FMN boleh digunakan kepada semua peranti USB seperti USB Wireless, USB Wireless, USB Memory Card Reader dan sebagainya. FMN akan dicipta bersama dengan peranti Bluetooth yang dihubungkan kepada Android Smartphone menggunakan aplikasi Android untuk berjaga-jaga dan mengingatkan pengguna supaya tidak lupa. Aplikasi ini diprogram menggunakan perisian Eclipse yang berteraskan pengaturcaraan java dan mungkin adalah secara langsung menyepadukan dengan Android Software Development Kit (SDK) Manager. Bagi melakukan komunikasi, aplikasi Personal Computer (PC) bersama dengan peranti USB digabungkan dengan peranti Bluetooth haruslah digunakan. Apabila pengguna FMN keluar daripada liputan Bluetooth, Android aplikasi akan mengingatkan pengguna dengan menggunakan penggera bunyi atau getaran bergantung kepada persekitaran pengguna. Oleh itu pengguna akan tahu bahawa peranti USB telah tertinggal. Liputan Bluetooth untuk kawasan terbuka ialah 48.14 meter dan untuk kawasan hampir ialah 17.24 meter. Aplikasi FMN sesuai dengan Android Smartphone yang menggunakan Platform 2.3 dan ke atas.

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CHAPTER 1

INTRODUCTION

1.0 Introduction

In this chapter will describe the purpose of this project generally. Started with problem statement according to the current issues and then the objective of the project are established to overcome the problem statement. There are also discuss about the limitation for this project.

1.1 Background

Universal Serial Bus (USB) device is "Plug and Play" interface which allowed a simple connection of mouse, printers, digital camera, scanner and many other peripherals to a computer (or other competent USB device). For people that using the USB device cannot guaranteed safe from lost, forget and misplaced.

This project will develop the application to reduce this worst situation using the Android application. The purpose of this project is to remind the USB device user not forgot take back their USB device when done use whether in the public places or personal place. This project chose the Android operating system (OS) because the Android OS user has increase year by year.

This project also known as Forget Me Not (FMN) that uses a Bluetooth communication protocol to communication with the USB device. When the user going

out from the Bluetooth coverage, the Android application will remind through sound alarm system or vibration alarm system depend to the user setting on the Android application. Due to alarm the user will be alert that their USB device has been forgotten at the last place visit. So that, the way the FMN reduce the missing or forgot issues for USB device.

1.2 Problem Statement

From data of the survey that had done in worldwide about losses or forgottten the USB devices, some of the problem statement of this project has list as follows:

1. The Universal Serial Bus (USB) device is a small devices and user always tend to lost or forgotten when done use at the public area such as cyber cafe, laboratory, library and etc.
2. The security systems for USB devices was exist in the world but expensive and not widely commercialize.

1.3 Objective

This research is aimed to meet the following objectives:

1. To develop an Android application to communicate by using Bluetooth protocol for Android operating systems.
2. To develop the Android application to be able remaining or notify the user when out of the Bluetooth coverage area.
3. To analysis the alert notification systems base on the Bluetooth type and coverage (distance).

1.4   Scope

The projects scope will cover aspects such as follows:

1. Using Android Software Development Kit (SDK) only to develop the Android application.
2. This project functions for all USB devices.
3. Using USB Bluetooth device to communicate with Android Smartphone.

CHAPTER 2

LITERATURE REVIEW

2.0   Introduction

In this chapter, the literature review will be providing in depth on the previous research to improve the Forget Me Not research. Literature review is in depth and a critical evaluation of previous research. It is actually the summary and synopsis of a particular area of research, which allowing anyone to read the paper that same topic or at least correlated to the research that be done. All the important information or aspect will be summarize and come out with the reasons that pursuing this particular research program.

In order to build the Forget Me Not, research had been made among the journals and also some books to studying the concept, theory and the method of the related aspect. After that, make the comparison between the journals and books that had been referred and do the conclusion at the end of this chapter. The selected aspect as below:
1. Smartphone
2. Bluetooth device
3. Universal Serial Bus (USB) devices
4. Alert system

2.1   Smartphone

Smartphone has become the matter which often conversation in public nowadays. Among the topics that popular during conversation such as Smartphone type, Operating System (OS) type, OS version, software or application and etc. There are many type of Smartphone in the today market which using the difference of the OS type and version such as Samsung Galaxy SII Smartphone embedded with Google Android OS version 2.3.3, iPhone 4S Smartphone embedded with the iOS version 5.0 and etc.

Smartphone is the high-end mobile phone that builds on a mobile computing platform having more advanced computing capacity and continuation from contemporary feature telephone. In the simplest term, the Smartphone is the mobile phone that embedded with feature functionality and facilitate user in line with world technology.

Refer to the Table 2.1, the total of the Smartphone user is around 300million of people in the world until February 2011. The Smartphone user will increase day by day due to the rapid technology development in the feature. The detail data for the Smartphone user statistic in the world had shown in Figure 2.1:
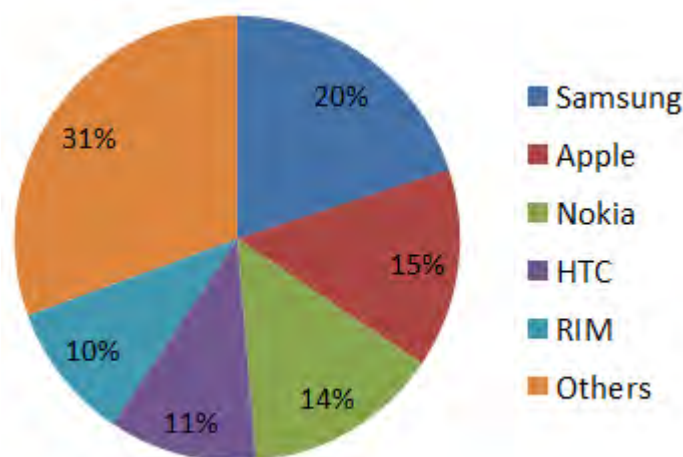

Figure 2.1: Worldwide Smartphone sales by November 2011[7].

Table 2.1: The mobile Smartphone shipment and market share by February 2011 global sales[8].

Rank	Vendor	According to International Data Corporation (IDC)		According to Strategy Analysis	
		Unit shipments (million)	Market share (%)	Unit shipments (million)	Market share (%)
1	Nokia	100.0	33.1	100.1	34.2
2	RIM	48.8	16.1	48.8	16.7
3	Apple	47.5	15.7	47.5	16.2
4	Samsung	23	7.6	-	-
5	HTC	21.5	7.1	-	-
6	Others	61.5	20.3	96.5	32.9
	Total	302.6	100.0	292.9	100

2.1.0 Smartphone Operating System (OS)

One of the top conversations among the people in the world is the Operating System (OS) on the Smartphone. The OS for each Smartphone is difference in term of type and version itself. There are many OS type that commonly used in the world such as below:

1. Android
2. iOS
3. BlackBerry
4. Symbian
5. Windows Phone/Mobile

Refer to the Table 2.2, the Android OS percentage of market share had increase year by year from 2009 until 2011 compare to all the OS type. The Android OS become the number one Smartphone OS in the world by 2011. This situation happens due to the increment in market share. The detail data for the Smartphone OS user statistic in the world had shown in Figure 2.2.
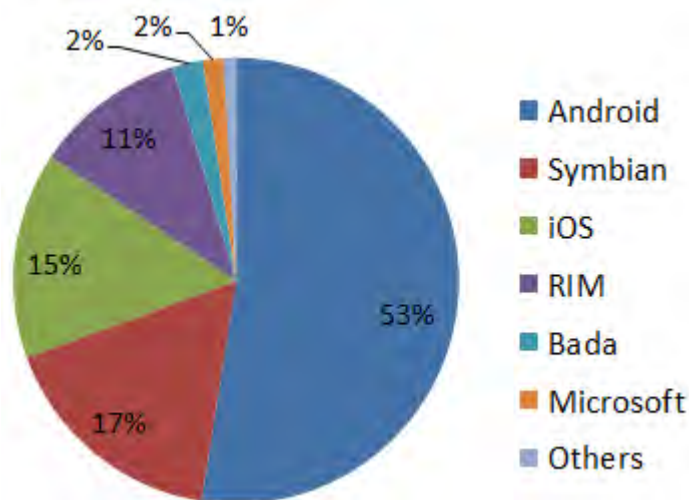
Figure 2.2: Global OS user in market share (rounded to nearest percentage point) by November 2011[7].

Table 2.2: The global market share of Smartphone operating system (OS) by 2011[8].

	According to the Gartner by April 2011			According to the International Data Corporation (IDC) by March 2011
Operating Systems (OS)	Market Share (%)			
	2009	2010	2011	2011
Android	3.9	22.7	38.5	39.5
Blackberry	19.9	16.0	13.4	14.9
iOS	14.4	15.7	19.4	15.7
Symbian	46.9	37.6	19.2	20.9
Windows Phone/Mobile	8.7	4.2	5.6	5.5
Others	6.1	3.8	3.9	3.5
Total Smartphone sold (million)	172	297	468	450

From the comparison according to the Smartphone OS market share above, the Android OS is the best choice for this project because the Android OS will increase

more than this year according to the Smartphone OS market share data from 2009 until 2011. Besides that, this project will be advantage to all people in the feature world and can support the technology development.

2.1.0.0 Android Application

From the Android developer's defines that Android as a software stack which is a set of software subsystems needed to deliver a fully functional solution for mobile devices. This stack software includes an operating system, middleware (software that connects the low-level operating system to high-level application) that is partly based on java and key application is written in java such as web browser and contact manager.

Figure 2.3: Android mascot.

2.1.0.1 Android Architecture

The Android software stack or operating systems consists of five layer of major components there is applications, application framework, libraries, Android runtime and Linux kernel as shown in Figure 2.4:

Figure 2.4: Android architecture.

2.1.0.2 Development the Android Application

This section will discuss about how to develop the Android application for accomplish this project successfully. There are two ways to develop the Android application which is using Android Software Development Kit (SDK) and using Android Native Development Kit (NDK).

The Android SDK is the one of the ways to develop Android application that uses the Java language. There are three major components to develop Android application using Android SDK which is Java programming, Eclipse Integrated Development Environment (IDE) and Android Virtual Drive (AVD) Manager. The Eclipse IDE will require the Java package to operate which is the Java Development Kit (JDK) from Java Platform Standard Edition (Java SE).

The Android NDK is also the ways to develop Android application that quite similar to the Android SDK but there are some difference. The difference that mention before is the programming language which is the Android NDK use the C++ language. The C++ language base on the C language and there are difference with Java language. The Android NDK also needs to be compile use the Java language after done design the application programming.