FIND ME FRIENDS: GPS TRACKER

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BORANG PENGESAHAN STATUS LAPORAN AKHIR PROJEK SARJANA MUDA (PSM)

JUDUL: Find Me Friends: GPS Tracker_____

SESI PENGAJIAN: 2016/2017_____

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This thesis is submitted in partial fulfilment of the requirements for the Bachelor of Computer Science (Software Development)

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DECLARATION

I hereby declare that this project report entitled

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is written by me and is my own effort and that no part has been plagiarized without citations.

STUDENT : _____ Date: _____

(SYAFIDA BINTI MOHAMMAD HASBULLAH)

SUPERVISOR : _____ Date: _____

(MUHAMMAD SUHAIZAN BIN SULONG)

DEDICATION

To my beloved parents.

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ACKNOWLEDGEMENT

First and foremost, I would like to thank my supervisor, Mr. Muhammad Suhaizan bin Sulong, for his assistance and guidance throughout the project. He has helped me make it through the times when my ideas come to a standstill, and when I lack motivation to finish the project. Things were difficult, but I made it to the end. So, thank you.

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ABSTRACT

The Find Me Friends: GPS Tracker is developed to address the problem of finding friends without the hassle of manually searching them or trying to contact them. The idea is to utilise the Global Positioning System (GPS) functionality embedded in a smartphone to detect friends or family by using this application. The project is developed in a period of 3 months. The project is inspired by the problem of finding people in a bustling place. The situation is similar when searching for a friend in a wide area. The project is also concern on the security of the person being search by exposing their location. The objective of this project is to build an application for tracking and locating, to study the GPS functionality of a smartphone, and to study the efficiency of GPS on a smartphone. The project is developed using Rapid Application Development methodology. The project mainly used the GPS detection method to locate the user's phone. The GPS detection method is the result of trilateration technique to determine the user's position, speed of their movement, and elevation from the ground. The technique involves the use of three or more satellites to pinpoint the user's location. The data from each satellite is used to narrow down where the user is from the overlapping area where the two sphere of the satellite detection meets. The use of more satellites will increase the accuracy of the location detection. Other than GPS detection, web service is also very crucial to the project as it handles the request from the application in the user's mobile phone. The web service handles the user authentication, location retrieval and storage, and friends' approval. The project is expected to grasp how GPS functionality in smartphone works. It will also hopefully be able to help people to find their family or friends and be more alert to their surroundings.

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ABSTRAK

Aplikasi Find Me Friends: GPS Tracker dibangunkan untuk menangani masalah mencari rakan-rakan tanpa perlu mencari secara manual atau cuba untuk menghubungi mereka. Idea ini adalah untuk menggunakan fungsi Sistem Kedudukan Global (GPS) terdapat dalam telefon pintar untuk mengesan rakan-rakan atau keluarga dengan menggunakan aplikasi ini. Projek ini dibangunkan dalam tempoh 3 bulan. Projek ini diilhamkan oleh masalah mencari orang di tempat yang sibuk. Keadaan ini adalah sama ketika mencari rakan di kawasan yang luas. Projek ini juga fokus kepada kebimbangan mengenai keselamatan orang yang dicari apabila mendedahkan lokasi mereka. Objektif projek ini adalah untuk membina sebuah aplikasi untuk mengesan dan mencari, untuk mengkaji fungsi GPS telefon pintar, dan untuk mengkaji kecekapan GPS pada telefon pintar. Projek ini dibangunkan menggunakan metodologi Pembangunan Aplikasi Rapid. Projek ini terutamanya digunakan kaedah pengesanan GPS untuk mengesan telefon pengguna. Kaedah pengesanan GPS adalah hasil daripada teknik penigasegian untuk menentukan kedudukan pengguna, kelajuan pergerakan mereka, dan ketinggian dari tanah. Teknik ini melibatkan penggunaan tiga atau lebih satelit untuk menentukan lokasi pengguna. Data dari setiap satelit digunakan untuk mengecilkan mana pengguna adalah dari kawasan bertindih antara dua kawasan pengesanan satelit. Penggunaan lebih banyak satelit akan meningkatkan ketepatan pengesanan lokasi. Selain daripada pengesanan GPS, perkhidmatan web juga sangat penting kepada projek ini kerana ia mengendalikan permintaan daripada aplikasi dalam telefon mudah alih pengguna. Perkhidmatan web mengendalikan pengesahan pengguna, lokasi semula dan penyimpanan, dan kelulusan rakan-rakan. Projek itu dijangka untuk memahami bagaimana fungsi GPS dalam kerja-kerja telefon pintar. Ia juga diharap dapat membantu orang ramai untuk mencari keluarga atau rakan-rakan mereka dan menjadi lebih peka kepada persekitaran.

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LIST OF ABBREVIATIONS

GPS	-	Global Positioning System
RFID	-	Radio Frequency Identification
UWB	-	Ultra-wideband
WLAN	-	Wireless Local Area Network
WHO	-	World Health Organization
IBM	-	International Business Machines
RPM	-	Remote patient monitoring
RSSI	-	Received signal strength indication
BLE	-	Bluetooth low energy
SIM	-	Subscriber identification module
SMS	-	Short Message Service
Plc	-	Public limited company
GSM	-	Global System for Mobile communication
3G	-	Third generation
WCDMA	-	Wide Band Code Division Multiple Access
CDMA	-	Code Division Multiple Access
IDE	-	Integrated development environment
UML	-	Unified Modelling Language
FTP	-	File transfer protocol
PHP	-	Hypertext pre-processor
MS	-	Microsoft
OS	-	Operating system
CPU	-	Central processing unit
RAM	-	Random access memory
ID	-	Identification
XML	-	Extensible markup language
REST	-	Representational State Transfer
GUI	-	Graphical user interface
HTTP	-	Hypertext transfer protocol
JSON	-	JavaScript Object Notation
IDE	-	Integrated development environment

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API	-	Application program interface
VCS	-	Version control system
FMF: GT	-	Find Me Friends: GPS Tracker

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CHAPTER I

INTRODUCTION

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1.1 Introduction

Global Positioning System (GPS) has made location tracking relatively easy. GPS has been used for determining a position, navigating from one point to another, monitoring the movement of an object, creating maps, and providing precise timing. The versatility of GPS and availability of GPS-equipped devices has expanded the use of GPS into our everyday lives.

Find Me Friends: GPS Tracker is an Android application that use the GPS function to locate other user's location and display it on a map for tracking. The application can be used to find the location of a friend in a big, crowded place by locating their smartphone with this application on. This project is made up of four modules that are user authentication, friend authentication, user detection, and distance calculation.

1.2 Problem statement(s)

i. Problem statement 1: Locating a person in a crowded place is difficult.

- A crowd of people cannot be avoided at the festivals, or shopping malls, or parks. In this situation, locating a person is challenging. In cases involving children, the children may get into some accident, or worst-case scenario, they might get kidnapped.

ii. Problem statement 2: Locating a person in a massive expanse takes too much time.

- Time is not something that is to be wasted when things run on schedule. The other person may wander too far off from the person and they would want to find them quickly to comply to the schedule they have.

iii. Problem statement 3: Exposing the exact location of a person can be very dangerous.

- Nowadays, data is very valuable. Exposing information such as one's current location to just about anyone can be bad. People can take advantage of this maybe by kidnapping, or robbing the person.

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1.3 Objective

i. Objective 1: To develop an application for user locating and tracking.
ii. Objective 2: To explore the GPS function on smartphone.
iii. Objective 3: To evaluate the tracking capabilities of GPS on smartphone.

1.4 Scope

The targeted user of this application is public. The application will consist of four modules that are user authentication, friend authentication, user detection, and distance calculation. This

application will be developed within 3-months period. The project is expected to finish in May 2017.

1.5 Project significance

This project will hopefully be able to help better understand how GPS on smartphone works. This project is also hopefully will be able to help people to keep track of their family or friends and increase people's awareness to their surroundings. This application has the potential to be used during pilgrimage in Mecca where a *Tabung Haji* employee can keep track of the pilgrims under their supervision. This application also has the potential to be used by parents to keep track of their children's location when they are not in the vicinity of the parents. Besides that, the application also can be used by prisoner on probation period, where the police can track their location using the location of their smart phone.

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1.6 Expected output

This project is expected to produce the following outputs:

- Output 1: Android application that explore the use of GPS on smartphone.
- Output 2: Android application that ease the task of locating and tracking a person.
- Output 3: Android application that provide a secure way of sharing location.

1.7 Conclusion

As a conclusion, this chapter discuss about the background of the Find Me Friends: GPS Tracker. Find Me Friends: GPS Tracker is a GPS-based application developed for Android smartphone. This application is aimed to be used by people that wish to track the location of their family, friends, or people under their care. This project will explore the use of GPS on smartphone. This project will hopefully be able to assess the advantage and limitation of GPS capability on a smartphone. The next activity is to research facts and findings related to the Find Me Friends: GPS Tracker and the methodology which will be used to develop this application.

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CHAPTER II

LITERATURE REVIEW AND PROJECT METHODOLOGY

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2.1 Introduction

This chapter is going to discuss about the facts and findings regarding the Find Me Friends: GPS Tracker to understand the concept, theories, and technologies related to the application and its domain. This chapter is also going to analyse the existing systems that are similar to the application that is being developed. The selected methodology for the development of this project is also going to be discussed. Next, the software, hardware, and other requirements of this project is going to be listed. Lastly, the project schedule and milestone are going to be listed.

2.2 Facts and Findings

This section is going to discuss about the domain of this project, tracking technology, the use of tracking technology, and the advantages of this technology in 2.2.1 through 2.2.3.

2.2.1 Tracking Technology

2.2.1.1 Introduction to Tracking Technology

The domain of this project is tracking technology. According to Oxford Dictionary online, track is an act of following the trail or movement of a person or object, often to find or mark their course. Tracking technology, on the other hand, is an application of a collection of technology to create a tracking system. Some of the technology used in tracking system are Global Positioning System (GPS), Radio Frequency Identification (RFID), Cellular-Based, Ultra-wideband (UWB), Wireless Local Area Network (WLAN), and Bluetooth (Hui Liu et al., 2007).

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Among these technologies, GPS is widely used for outdoor environment positioning system such as vehicle tracking, navigation and law enforcement. However, the system became limited when it is used indoor due to the limited or poor satellite signal coverage. Despite this limiting factor, GPS is the most direct way to track a smartphone because the presence of GPS as built-in features in most smartphones today (Hao Tang et al., 2016). WLAN also got many attentions because of its availability in the real-world environment. It is used in WLAN location fingerprinting.