SPORT TRAINING SYSTEM WITH ANDROID BASED APPLICATIONS USING WIRELESS CONNECTIVITY

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This Report Is Submitted In Partial Fulfillment Of Requirements For The Bachelor Degree of Electronic Engineering (Telecommunication)

Fakulti Kejuruteraan Elektronik Dan Komputer
Universiti Teknikal Malaysia Melaka

JUNE 2012

UNIVERSTI TEKNIKAL MALAYSIA MELAKA

FAKULTI KEJURUTERAAN ELEKTRONIK DAN KEJURUTERAAN KOMPUTER

BORANG PENGESAHAN STATUS LAPORAN

PROJEK SARJANA MUDA II

Tajuk Projek : SPORT TRAINING SYSTEM WITH ANDROID BASED APPLICATIONS USING WIRELESS CONNECTIVITY

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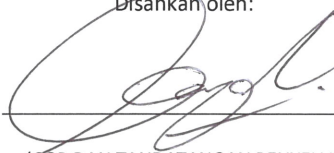
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Dedicated To

Mom and Dad

Your prayers keep me moving forward

Teachers

Fill my heart with the truth and knowledge

Beloved friends

Make my world happens

Every Muslims

May Allah bless you all here and hereafter

-Al-fatihah-

ACKNOWLEDGEMENT

Alhamdulillah. Praised be to Allah for his blessings and giving me the strength along the challenging journey to completing the project as well as this thesis writing, for without Him, I would not have been able to come this far.

Firstly, I would like to express my sincere gratitude to my supervisor, Mr Hamzah Asyrani Bin Sulaiman for the continuous support for my PSM, for his patience, motivation, enthusiasm, and immense knowledge. His guidance helped me in all the time of research, developing and writing of this thesis.

My outmost thanks also go to all my family members who have given me support throughout my academic years. To all my friends, especially BENT's students who have helped and supported me along the way, thank you so much. Your presence and your countless effort and support had given me great strength and confidence.

ABSTRACT

A healthy lifestyle still remain a challenge for every human living on earth today. It is hard to keep in discipline of what we don't enjoy doing as some of people today think that's exercising is boring as they do know that exercising is essential for them to stay in good health. People will get boring when they don't know what they are doing and what are their improvement. Living a healthier life can not only extend your life, it can also improve the quality. Feeling physically better and having control over your own life can greatly increase your mental health as well. Although there are some aspects of physical and mental health that are beyond an individual's and science's control, there are many things that people can do to improve their quality of life and one sure way is by exercise regularly. Hence, this research intend to promote a healthy lifestyle by giving out an application that can track user routes, record the routes, shows the speed of the users running. The primary focus of this research is to helps users of the Android Mobile Operating System maximize the uses of their smartphone for a healthier lifestyle without additional cost of using another devices than their own smartphones.

ABSTRAK

Gaya hidup yang sihat masih menjadi sesuatu yang amat mencabar untuk semua manusia yang masih hidup pada masa kini.Amat susah untuk mendisiplinkan diri untuk melakukan sesuatu yang tidak disukai walaupun ramai yang tahu senaman adalah sesuatu yang penting untuk mengekalkan tahap kesihatan yang baik.Menjalani kehiduapan yang sihat pada umumnya bukan sahaja dapat memanjangkan umur malah dapat meningkatkan kualiti hidup.Mempunyai keadaan fizikal yang baik bukan sahaja menjadikan anda lebih yakin dengan diri sendiri malah ia juga dapat dapat meningkatkan kesihatan dari segi mental.Walaupun ada juga beberapa aspek kesihatan fizikal dan mental yang tidak dapat dikawal oleh manusia,tetapi banyak perkara yang boleh dilakukan untuk meningkatkan kualiti hidup seperti dengan bersenam secara kerap. Oleh itu, kajian ini berhasrat untuk menggalakkan gaya hidup sihat dengan memberikan suatu aplikasi yang boleh menjejaki laluan pengguna, merekodkan laluan, menunjukkan kelajuan pengguna berjalan. Fokus utama kajian ini adalah untuk membantu pengguna-pengguna Sistem Operasi Android memaksimumkan penggunaan telefon pintar mereka untuk gaya hidup yang sihat tanpa kos tambahan menggunakan alatan lain selain daripada telefon pintar mereka yang sudah sedai ada.

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LIST OF ABBREVIATIONS

OS	-	OPERATING SYSTEMS
SDK	-	SOFTWARE DEVELOPMENT KIT
ADT	-	ANDROID DEVELOPMENT TOOLS
ADK	-	ANDROID DEVELOPMENT KIT
JDK	-	JAVA DEVELOPMENT KIT
DDMS	-	DALVIK DEBUG MONITOR SERVER
IDE	-	INTEGRATED DRIVE ELECTRONIC

CHAPTER 1

INTRODUCTION

This chapter will briefly discuss about background project. It also includes objectives, problem statement or research background, scope of work, methodology and report structure.

1.1   Background

"Prevention is the best cure" is a popular saying among healthcare professionals. This means that the easiest way to get healthy is to avoid getting sick in the first place. While this is not always possible, there are many ways to prevent possible future health problems and illnesses.

One of the best ways, and the main purpose of this course, is to have a healthy diet and exercise regularly. This can prevent very serious diseases like heart disease, diabetes, high blood pressure, and strokes, to name a few. But there are many other ways to prevent illnesses or stop illnesses from getting worse. A number of these are listed below, but these are by no means the only. Talk to your doctor or healthcare professional

for more ideas on prevention and healthy living, especially related to your lifestyle and nutrition

Improvement of human lifestyle quality has been driven by a few factors such as the expensive cost of healthcare, a longer lifespan, quality time that balance out between work and leisure, and the personal intention to have good and quality life. Nowadays, people are starting to concern about their lifestyle, about how they live, what they eat and mostly about their health. But in the vast world like today, time plays a big role. Monitoring health can take a whole lot of time through a doctor or hospital. So, self-monitoring system that portable that can monitor health either during work, leisure, and exercise is needed. For athletes, this kind of system can help to monitor their progress in training. The outcome can become much better where it can dramatically decrease cost of using too many expensive devices. Monitoring health during extreme sports like hiking is necessary to avoid injury or fatality. One slight decision without concerning about health and body condition will surely cost a life. Based on this problem, a system that be able to monitoring the health during a rough condition without affecting the ability of the user to carry it is needed.

Living a healthier life can not only extend your life, it can also improve the quality. Feeling physically better and having control over your own life can greatly increase your mental health as well. Although there are some aspects of physical and mental health that are beyond an individual's and science's control, there are many things that people can do to improve their quality of life and one sure way is by exercise regularly.

1.2   Problem background

The main task for this research work is to study and develop a system that can monitor physical activities during sports training or exercising. A system that is inexpensive, portable, and easy to use. Anyone can afford and use it. For example at

each group training, doctors are forced to focus and on a single player at a great disadvantage of time. The team doctor also can monitor every single player at the same time without moving along with the player. Team doctor can use a real tracking route to train the player and monitor the training session of a player despite having to use the indoor treadmill. As for individual, it can help the individual keep track of whats he been exercising before. Using today recent technology, an individual just use a manual type of getting track of what happened yesterday. Don't know how many kilometres have been jogged for the past few weeks, blood pressure during the exercise, is it the time attack for same route is going better or not. For sure, an individual will have a money issue if its going to have a personal exercise assistant to tell them what they been doing.
SOTAS, will cover all those problem with such an affordable way.

1.3   Research Aim

This research aim to produce a mobile monitoring system application based On Android OS that will be able to monitor blood pressure,heart beat and record tracking route.

1.4   Research Objective

The objectives for this research study are as follows :

- To develop a mobile monitoring system called Sport Training and Health System (SOTAS) application using Android-based smartphone.

- To combine the mobile monitoring system SOTAS with an external devices that can calculate data and perform analysis.

- To perform reliability test on SOTAS using software application with wireless connectivity.

1.5   Scope Of the Study

Our scope of study is to develop an application that will be use to calculate a human health an compatible with an OS android that will be use together with the health device.

There are two part involve in this project.First part of this project is about the software that will be used as the main interface and function to calculate data receive from the external monitoring device.second part of this project is the external monitoring device that will connect to the smartphone via wireless connection.Combine together all this software and hardware and it called Sport Training And Health System(SOTAS) .

1.6   Significance of the study

The significance of the study is to properly visualize and monitor the blood pressure and the heart beat while exercising, by using an affordable Android base OS. This might help people to understand their health more, keep track of their health and make exercise more fun.

CHAPTER 2

LITERATURE REVIEW

2.1   Introduction

The increasing of need for healthy lifestyle has become one of the common interests among the technology developer to develop a systems that can satisfy their customer in every aspect of living in healthy lifestyle. Developers have been taking advantage of the consumer through today most common use gadget which is smartphones. With all the importance of market change from feature phones to smartphones, most of the previous research on smartphones has been conducted on the assumption that smartphone is used as a specialized tool for a particular purpose, such as smartphones for logistics or smartphones for medical use[1].Also, come with smartphones their operating systems such as Symbians, Android, iPhone, Blackberry, and Windows. These operating systems also evolve equivalent to the development of Smartphones.

2.2   Smartphones

The popularity and range of smartphones has exploded in the last few years, but believe it or not, smartphones first appeared nearly 20 years ago in 1992 (although they were not called smartphones back then). The mobile-phone market maintained rapid growth until 2002, at which point the growth rate of the mobile phone is considered to have reached maturity in the market[2]. In 1992 the IBM Launch 'Simon'. Simon was the nickname for the first phone launched which could do much more than make and receive calls and send texts. It was incredibly advanced for the time and offered amongst other things a calendar, world time, address book, notepad, email and even had a touchscreen. Priced at $899.00, it was only available in the US. Then come in 1996 it's the Nokia 9000.

During the late 90′s, Nokia launched a range of phones aimed at business users. This range started with the hinged Nokia 9000, which was a cross between a phone and a PDA, and was quickly followed by the 9210, 9300 and 9500. The Nokia 9210 was one of the first phones to use an open operating system. Next year which is 1997, a year of A Smartphone is Born.The first handset to actually be called a smartphone was the strangely named Penelope from Ericsson. This was a concept phone and only around 200 units were ever made, but it paved the way for Ericsson to develop the R380 a few years later. Starting to make a different, in 2000 Ericsson launch the R380 , the first phone to be marketed as a smartphone. It featured both communication and PDA functions and used a clever touchscreen which could be covered by a hinged keyboard when it was being used to make calls. The R380 was the first commercially available smartphone to use the Symbian OS. The year 2002 was a busy year for smartphones and saw the release of the Palm Treo with its full querty keyboard, the P800 from newly merged Sony Ericsson and the first ever Blackberry. The P800 added several new features to the smartphone market, including a MP3 player and a colour touchscreen. Blackberry concentrated on providing wireless email access, something it continues to do today.Sony Ericsson launch the N-series of smartphones. This series of phones were initially marketed as mobile multimedia computers. The N-series continues to improve and innovate year after year and has become a favourite of business people.The much-

hyped and subsequently much-loved iPhone hits the shops and sells by the bucket load. The Apple brand unboubtedly helps to sell the phone, but it is the success of the App Store in 2008 which keeps it ahead of the game. To date there are close to 200,000 commercial and free apps available to iPhone users, turning the iPhone into everything from an art studio to a spirit level.only in 2008, The Android Arrives and developed as an open-source product and backed by Google, HTC, Intel and several other influential companies, Android was touted as the future for smartphone Operating Systems. The First phone to use this new OS was the HTC Dream (or T-Mobile G1 as it was also branded). Android is quickly becoming a favourite OS for smartphone manufacterers and it is thought that there are already 70,000+ apps available. Several companies launch their own App Stores, including Nokia's Ovi Store, Windows Marketplace for Mobile and Blackberry App World. Android sees it's marketshare grow from 3% at the start of 2009 to nearly 20%. It is a fairly quiet year for Apple, with iPhone fans waiting for the new iPhone 4 handset due out the following year. New versions of the iPhone 3 appear, including the 3GS. Many Apple fans object to the wallet-busting price tag for even a standard model. Last year which is 2010, Apple announces reaching the 3 Billion download mark on its App Store and launches iOS 4 and the iPhone 4 which uses Api's to allow third party apps to multitask. The new iPhone sells in massive amounts but suffers something of a blip when it is discovered that gripping the metal frame too hard can make the signal drop. Android makes huge inroads into the smartphone market and grabs a 20% marketshare, largely thanks to the release of the Nexus One and some brilliant handsets from Samsung and HTC. Sales of all smartphones increase by 72% in 2010 and make up nearly 20% of all mobile phones sold.This year, with Apple, HTC, Samsung, Nokia and every other major manufacturer releasing a new, faster, more powerful smartphone on almost a weekly basis, the future of smartphone certainly seems bright. Screens are getting bigger and brighter, processors are getting more and more powerful and the amount of free and commercial apps available is growing daily. Accelerometers integrated in modern smartphones pave the way to intuitively use gestures for collaboratively controlling interactive applications. Using and holding smartphones has become natural and ensures user acceptance as well as intuitive handling[3].

2.2   Android

Android Incorporation located at Palo Alto, California, United States. Android Incorporation was   founded in 2003 by Andy Rubin(Presently Director of Mobile Platforms at Google) and Danger and by July 2005,Google incorporation   bought Android Incorporation which is co-founded by Andy Rubin And Danger. They were developing softwares for smarter mobile phones that were more aware of its owner's location and preferences .November 5,2007-Open Handset Alliance a consortium of several companies which include HTC, Intel, Marvell Technology, Broadcom Corporation, Motorola, Texas Instruments, Qualcomm, T-mobile, Sprint Nextel, LG, Google, Samsung Electronics was founded in December 9, 2008, Atheros Communications, Asustek Computer Incorporation, Garmin Limited, Huawei Technologies, Vodafone Group Plc, Toshiba Corp, Softbank and ARM holdings joined the open standards community. The Open Handset unveiled their first product, which was built on Linux Kernel 2.6 and their logo was designed by Ascender Corporation. Android uses new power management framework to save power in mobile devices. Android developers are allowed to build only JAVA applications and Google tries to make Android as energy efficient as possible to save battery power in mobiles devices .Android also provides better VM designs but consumes more energy due to the lack of dynamic compiler in Dalvik JVM.The implication is that, Android can become more efficient by implementing an optimized dynamic compiler in Dalvik JVM[4].

2.3   Sport Trainings System

The performance of elite athletes today arguably has almost as much to do with science[5], as it does with training. Today athletes, coaches and sport scientists strive to extract incremental 'fraction of a second' improvement in timed events, this often being the difference between today's champion and a finisher. Sport training, complicated and empirical, is the system engineering with a large dependence on the training program, Therefore, the research and development of CAD devoted to sports training will

significant to control the training process and improve the training efficiency and quality[6].The essence of sport training system is to improve the ways of training to become more efficient in time management and energy management in achieving the best health condition. The sport training system also help in evaluating and keeping track of current progress of the training. With the integrated accelerometers in modern smartphones, Sport Training System also can be integrated in today smartphones which is essential for today smartphones consumers. Moreover, smartphones have better capabilities than other input devices, they are capable of giving the user feedback (vibrating, playing sound / videos and so on)[3].

CHAPTER 3

RESEARCH METHODOLOGY

3.1   Research Procedure

This research consists two main phases. First phase involve finding the research focus and problems background regarding the Android OS Base System. In This phase the literature review of Smartphones and the Android OS. Then the framework of Sport Training System Using Android OS will be developed.

Second Phase is involving the learning and programming of application or system using open source software. The application that will be learn majority on Android OS. The software for develop the application is a software called Eclipse as a loader for Software Development Kit(SDK) including some add on which is Java Development Kit(JDK). After that the application will be test on the smartphone to evaluate the compatibility that the application have with the smartphones.

.   Based on the result, the system will be calibrated once again to make sure the precision is as expected.

3.2   Development Environment

In order to first use the Android SDK code and tools for development, a suitable environment is needed such as:

- Eclipse

  Eclipse3.2,3.3,(Europa)
  Android Development Tools plugin (optional)

- Other development environments or IDEs

  JDK5 or JDK 6 (JRE alone is not sufficient)
  Not compatible with Gnu Compiler for Java (gcj)
  Apache Ant 1.6.5 or later for Linux and Mac, 1.7 or later for Windows

Installing The Android SDK

First you will need to download the Android SDK pack .zip archive, once downloaded find a suitable installation location on your machine and extract the zipped files.

Please note: This installation location will be referred to as $SDK_ROOT from now on through this tutorial

Alternatively you can add /tools to your root path which will prevent the need to specify the full path to the tools directory along with enabling you to run Android Debug Bridge (adb) along with other command line tools.

Linux

1. Edit the ~/.bash_profile or ~/.bashrc files looking for a line that sets the PATH variable.
2. Add the full path location to your $SDK_ROOT/tools location for the PATH variable.
3. If no PATH line exists you can add the line by typing the following:
4. export PATH=${PATH}:<path to your $SDK_ROOT/tools>

Mac OS X

1. In the home directory locate the .bash_profile and locating the PATH variable add the location to your $SDK_ROOT/tools folder.

Windows XP / Vista

1. Right click on the My Computer icon and select the properties tab.
2. Select the Advanced tab and click the Environment Variables button.
3. In the new dialog box dowble-click on Path (located under System Variables) and type in the full path location to the tools directory.

The Android SDK also requires a suitable development environment to work in, here's the installation guides for each of the supported environments.

Android Eclipse Plugin (ADT)

If you choose to use the Eclipse IDE as your Android development environment you will have the opportunity to install and run a plug-in called Android Development Tools. ADT comes with a variety of powerful tools and extensions that will make creating, running and debugging your Android applications much easier and faster.

In order to download and install ADT you will first need to configure an Eclipse remote update, this can achieved via the following steps: