MOBILE LEARNING APPLICATION FOR FUNDAMENTAL ELECTRONICS

DENIE SANGKIU

This Report Is Submitted In Partial Fulfillment of Requirements for the Bachelor Degree of Electronic Engineering (Computer Engineering)

Faculty of Electronic Engineering and Computer Engineering

Universiti Teknikal Malaysia Melaka

June 2012

UNIVERSTI TEKNIKAL MALAYSIA MELAKA
FAKULTI KEJURUTERAAN ELEKTRONIK DAN KEJURUTERAAN KOMPUTER

BORANG PENGESAHAN STATUS LAPORAN
PROJEK SARJANA MUDA II

TajukProjek : MOBILE LEARNING APPLICATION FOR FUNDAMENTAL ELECTRONICS

SesiPengajian : | 1 | 1 | / | 1 | 2 |

Saya …DENIE SANGKIU……..
(HURUF BESAR)
mengakumembenarkanLaporanProjekSarjanaMudainidisimpan di Perpustakaandengansyarat-syaratkegunaansepertiberikut:

1. Laporanadalahhakmilik Universiti Teknikal Malaysia Melaka.
2. Perpustakaandibenarkanmembuatsalinanuntuktujuanpengajiansahaja.
3. Perpustakaandibenarkanmembuatsalinanlaporaninisebagaibahanpertukaranantarainstitusipengajian tinggi.
4. Silatandakan (√) :

☐	**SULIT***	*(Mengandungimaklumat yang berdarjahkeselamatanataukepentingan Malaysia seperti yang termaktubdi dalam AKTA RAHSIA RASMI 1972)
☐	**TERHAD****	**(Mengandungimaklumatterhad yang telahditentukanolehorganisasi/badan di manapenyelidikandijalankan)
/	**TIDAK TERHAD**	

Disahkanoleh:

(TANDATANGAN PENULIS)

(COP DAN TANDATANGAN PENYELIA)
LIZAWATI BINTI SALAHUDDIN
Pensyarah
Fakulti Kejuruteraan Elektronik Dan Kejuruteraan Komputer
Universiti Teknikal Malaysia Melaka (UTeM)
Karung Berkunci No 1752
Pejabat Pos Durian Tunggal
76109 Durian Tunggal, Melaka.

Tarikh: 15/6/12

Tarikh: 15/6/12

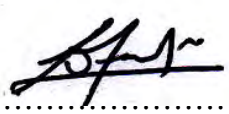
"I declare that this report is the result of my own work except for the summary and the passage that I cited the source."

Signature : 

Author : DENIE SANGKIU

Date : 15/6/12

"I hereby declare that I have read this report and in my opinion this report is sufficient in terms of scope and quality for the award of a Bachelor Degree of Electronic Engineering (Computer Engineering)."

Signature : 

Supervisor : LIZAWATI BINTI SALAHUDDIN

Date : 15/6/12

Dedicated to my beloved mother and father

ACKNOWLEDGEMENT

I would like to thank Faculty of Electronic Engineering and Computer Engineering Department, UTeM for giving me the opportunity to study and research on a final year project. This project really helps me a lot to understand and apply the knowledge that I learned for four years in university. Firstly, I would like to take this opportunity to express my appreciation to my project supervisor, Mrs. Lizawati bte Salahuddin, for her kind tutelage, comments and suggestions in the development of this project. She has guided me and pushed me to finish this project on time. I also would like to thank all my dear friends who have contributed to this project progress and helped me find the sources. Without their supports, none of this would be possible. Besides that, I also would like to express my deepest appreciation to my family members, for the financial and mentally support to complete my Degree studies. Finally, I would like to express my gratitude to all who have directly or indirectly guided me one way or another throughout all the stages of preparing this project.

ABSTRACT

In university, students have to memorize a lot of things. Besides, they do not have books in their hands the entire time. The students can refer to any books as a reference but the problem is the book is too large and heavy to carry anywhere. Thus, this project aims to develop a mobile learning application that can be carried everywhere most of the time. The objectives of this project are to develop a mobile application for fundamental electronics, to compile basic and digital electronics in one application and to generate resistor color code and Ohm's Law circuit. Mobile Learning Application for Fundamental Electronics is a simple mobile application that installed in iOS and Android OS devices. It contains combinations of basic electronics and digital electronics in one resource, and combinations of electronic related calculators. The methodology used is waterfall model based on five main phases which are data analysis, design, development, verification and maintenance. The results generated such as theory of electronics, symbols, logic gates, truth tables, Boolean equations, resistor color code calculator, and Ohm's Law circuits. As the conclusion, this application can be used for educational purpose outside of classroom and helps student to save their times to refer on fundamental electronics during revision or when they do their homework.

ABSTRAK

Di universiti, pelajar perlu menghafal banyak perkara. Selain itu, mereka tidak mempunyai buku di tangan mereka sepanjang masa. Pelajar boleh merujuk kepada mana-mana buku sebagai rujukan tetapi, buku tersebut adalah terlalu besar dan berat untuk dibawa ke mana-mana. Jadi, ia adalah penting untuk membangunkan perisian yang lebih kecil, ringan dan boleh dibawa ke mana-mana pada bila-bila masa sahaja. Objektif projek ini adalah untuk membangunkan satu aplikasi mudah alih untuk elektronik asas, untuk menyusun elektronik asas dan digital dalam satu aplikasi dan untuk menjana kod warna perintang dan litar Hukum Ohm. Aplikasi Pembelajaran Bergerak Untuk Elektronik Asas adalah aplikasi mudah alih yang dimuat di dalam peranti iOS dan Android OS. Ia mengandungi kombinasi asas elektronik dan elektronik digital dalam satu sumber, dan kombinasi kalkulator elektronik yang berkaitan. Metodologi yang digunakan adalah model air terjun yang berasaskan lima fasa utama iaitu analisis data, reka bentuk, pembangunan, pengesahan dan penyelenggaraan. Keputusan yang dijana adalah seperti teori elektronik, simbol, get logik, jadual kebenaran, persamaan Boolean, kalkulator kod warna perintang, dan litar Hukum Ohm. Sebagai kesimpulan, applikasi ini boleh digunakan untuk tujuan pendidikan di luar bilik darjah dan membantu pelajar untuk menjimatkan masa mereka untuk merujuk kepada elektronik asas semasa ulangkaji atau apabila mereka melakukan kerja rumah mereka.

LIST OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

PDA	-	Personal Digital Assistant
AIR	-	Adobe Integrated Runtime
OS	-	Operating System

LIST OF APPENDICES

CHAPTER I

INTRODUCTION

Chapter I describes on the introduction of the Final Year Project of Degree. It contains brief explanations of subchapters such as problem statements, objectives, scopes of project, and methodology used.

1.1 Introduction

Today, we are witnessing the emergence of a connected, mobile society, with a variety of information sources and means of communication available at home, work, school, and in the community at large. Some even describe this as the beginning of the next social revolution A high proportion of people in the world have mobile phones that can handle both voice calls and the display of textual information. Many newer phones also have the ability to connect wirelessly to the internet. Hand-held computers, otherwise known as personal digital assistants (PDAs), are also becoming more widespread (BBC 2004) are being distributed by employers who are eager to keep their workforce productive whilst on the move.

Laptops, though already a well-established technology, have gained new appeal when combined with the connectivity of newer mobile phones. A laptop can now use a mobile phone as a means to dial-up the internet and in doing so offer a truly mobile web experience. Furthermore, kiosks and information screens are

appearing all around the country, and both researchers and industry are keen to exploit the potential of these ‘ambient’ approaches to providing rich information spaces. There is considerable interest from educators and technical developers in exploiting the unique capabilities and characteristics of mobile technologies to enable new and engaging forms of learning. This review explores the use of these mobile technologies for learning, considered against a backdrop of existing learning theories that have been applied to the use of computers in education.

The mobile applications market is currently undergoing rapid expansion, as mobile platforms continue to improve in performance, and as the users need for a wide variety of mobile applications increases. The latest mobile platforms allow for extensive utilization of network resources, and thus offer a strong alternative to workstations and associated software. The project’s name for the Final Year Project is Mobile Learning Application for Fundamental Electronics.

The Mobile Learning Application for Fundamental Electronics is a simple mobile software application that consists of basic knowledge of electronics and digital electronics. This mobile application helps users to refer on basic electronics knowledge and do some electronic calculations. As it is installed on mobile, it can be carried anywhere and anytime. This application is designed for iPhone and Android platform because these two and platforms are the famous mobile technologies nowadays. Students can save time without searching through books and can do quick reference for fundamental knowledge.

The mobile learning application for fundamental electronics contains elements of electronics as follow:

(a) Basic electronics
(b) Digital electronics
(c) Resistor color code calculator
(d) Ohm’s Law circuit
(e) Circuit schematic symbols
(f) Boolean logic gates and truth tables
(g) Series and parallel Circuit

1.2 Problem Statement

Fundamental electronics is becoming an important course and the main subject in university that need to be taken especially for first to third year electronic engineering students or any related fields. It is also applied to technicians, engineers and lecturers. There are a lot of things that the students should memorize and understand about electronics knowledge. There are books related to the fundamental electronics and students are suggested to buy it but the problem is, the students do not refer to the books everywhere as it is large, heavy and cannot be bring everywhere. Besides that, the students need to open a book of 500-1000 pages just to refer the basic knowledge and it is such a wasting time.

As a solution, a mobile learning application for fundamental electronics is implemented and installed in mobile and specifically designed to help the engineering students. It is simple, and easy mobile application that can be carried everywhere, anytime, as it is installed in a chosen mobile platforms. Students can make quick reference as they can go through the application contents easily in a second and they do not need to open so many electronics books just to refer the basic knowledge. This application will help students to save a lot of their times and provides self study outside of classroom. Besides, the unique of this application is it does not need an internet connection to launch the program. Once it is reached out from the pocket, with a single click, the program is running and users can navigate through it so quickly.

1.3 Objectives

The objectives of this project are as the following:

(a) To develop a fundamental electronics program for mobile application
(b) To compile and combine basic electronics and digital electronics in one mobile application.
(c) To generate resistor color code and Ohm's Law in mobile.

1.4 Scopes

The scopes of this project are limited to as the following:

(a) This application can be executed in iOS (iPhone) platform and Android platform (Android 2.2 or higher version). It cannot support any other platforms.

(b) This application can be used whoever users that related to electronics especially for electronic engineering students, technicians, lecturers, engineers or any other related fields in university course but the main target users is students.

(c) The contents of the application are limited to basic electronics, digital electronics and electronics related calculators.

(d) The development tools used to develop this application are Adobe Flash Professional CS5.5 and Adobe Photoshop CS5.1.

(e) This application does not need an internet connection to be launched.

1.5 Methodology

Methodology is generally a guideline system for solving a problem, with specific components such as phases, tasks, methods, techniques and tools. For this project, the methodology used is based on waterfall model. This will be discussed further in Chapter III.

CHAPTER II

LITERATURE REVIEW

Chapter II describes on the data analysis and review about mobile technology and its importance. This chapter also discuss about the contents of the mobile application.

2.1 Mobile Application Overview

Mobile applications are a rapidly developing segment of the global mobile market. They consist of software that runs on a mobile device and performs task for the user of the mobile phone. As they are also known as downloadable software, mobile applications are common on most phones, including inexpensive, entry-level models. Their wide use is due to the many functions they perform, including providing users interfaces for basic telephony and messaging services, as well as for advanced services such as games and videos. Other examples include tools for downloading and reading blogs, such as ContentNext's application for MocoNews and Opera Mini™ browser.

Mobile application development is the process by which application software is developed for small low-power handheld devices such as mobile phones. These

applications are either pre-installed on phones during manufacture, or downloaded by customers from various mobile software distribution platforms.

2.2 What Are New Mobile Technologies And Why Are They Relevant To Learning?

With respect to technologies, mobile generally means portable and personal, like a mobile phone. Many examples of learning with mobile technologies fit in to this description. Personal digital assistants and mobile phones are the most commonly used technologies for mobile learning, but they exist within the larger space of possible mobile technologies that can be broadly categorised on the two dimensions of personal vs shared and portable vs static.

2.3 The Future of Mobile Technology In Education

Mobile technologies are becoming more embedded, ubiquitous and networked, with enhanced capabilities for rich social interactions, context awareness and internet connectivity. Such technologies can have a great impact on learning. Learning will move more and more outside of the classroom and into the learner's environments, both real and virtual, thus becoming more situated, personal, collaborative and lifelong. The challenge will be to discover how to use mobile technologies to transform learning into a seamless part of daily life to the point where it is not recognised as learning at all.

2.4 Implications For Learners, Teachers, and Curriculum Developers

Learning and teaching with mobile technologies is beginning to make a breakthrough from small-scale pilots to institution-wide implementations. In order for these implementations to be successful, educators and technology developers must consider the following key issues:

(a) Context:

Gathering and utilising contextual information may clash with the learner's wish for anonymity and privacy. The ability to acquire information about the user and his or her environment presents a unique ability to personalise the learning opportunity. There are, however, significant ethical issues in gathering and utilising contextual information [1]. For example, context information needs to be gathered with the consent of users, and must be stored securely to prevent misuse by third parties. This is also related to the issue of coupling between the informatics layer provided by the devices and the existing communication layers of the classroom (or other environment).

(b) Mobility:

The ability to link to activities in the outside world also provides students with the capability to 'escape' the classroom and engage in activities that do not correspond with either the teacher's agenda or the curriculum. The 'anytime, anywhere' capabilities of mobile devices encourage learning experiences outside of a teacher-managed classroom environment. Inside the classroom, mobile devices provide students with the capabilities to link to activities in the outside world that do not correspond with either the teacher's agenda or the curriculum [2]. Both scenarios present significant challenges to conventional teaching practices.

(c) Learning over time:

Effective tools are needed for the recording, organisation and retrieval of (mobile) learning experiences. Lifelong learners will need effective tools to record, organise and reflect on their mobile learning experiences [3].

(d) Informality:

Students may abandon their use of certain technologies if they perceive their social networks to be under attack. The benefits of the informality of mobile devices may be lost if their use becomes widespread throughout formal education.

(e) Ownership:

Students want to own and control their personal technology, but this presents a challenge when they bring it in to the classroom. Both personal and group learning

are most effectively supported when each student has access to a device. The ownership of the devices is thus a key consideration. Both tangible and intangible benefits can accrue through the use of mobile devices [4]. Intangible benefits include a sense of belonging with the device and personal commitment and comfort. Ownership is stated as a prerequisite for engagement, where students have the potential to go "beyond the necessary and play with it to explore its potential". Personal ownership does, however, present a challenge to the institutional control of the technology [5].

2.5 Classification of Mobile Technologies

There are many different kinds of technology that can be classed as 'mobile'. Mobile, to most, means 'portable' and 'movable'. It also seems to implicate a 'personal' as opposed to 'shared' context of use, and the terms 'mobile' and 'personal' are often used interchangeably but a device might be one without necessarily being the other. We can classify the range of mobile technologies using the two orthogonal. Figure 2.1 shows the classification of mobile technologies.

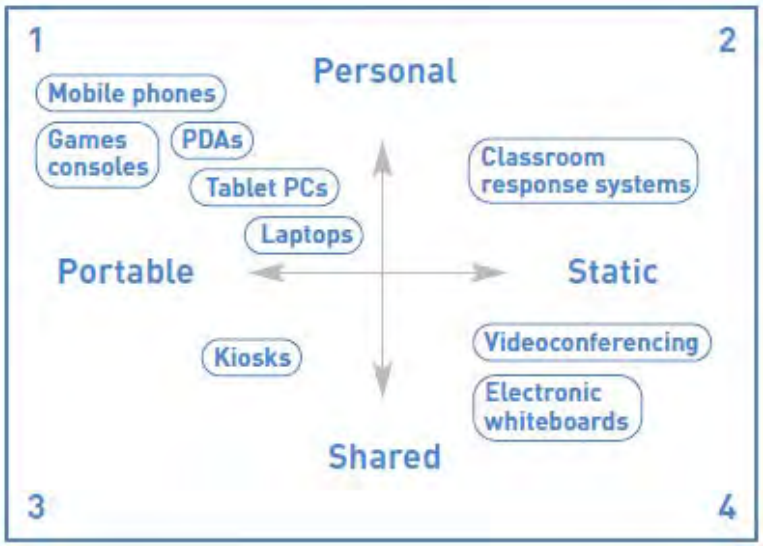


Figure 2.1: Classification of Mobile Technologies [6]