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MOBILE APPLICATION DESIGN FOR M-LEARNING CONTENT

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MOBILE APPLICATION DESIGN FOR M-LEARNING CONTENT

By

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for the degree of Masters of Computer Science

MOBILE LEARNING APPLICATION CONTENT DESIGN

By

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Faculty: Faculty of Computer Science and Information Technology

Nowadays, the use of mobile devices as a medium of getting information through the Internet is getting wider. Many transactions and operations are automated and available to be adapted to mobile devices. There is also a rapid growth mobile application and if designed to tailor to education needs, could be very beneficial to society. However, while many “classic” software engineering techniques can be transferred easily to the mobile application domain, the development of mobile application in the education domain is still new and in need of further research and development. Over the last two decades, learning institutions have become accustomed to the growing use of mobile technology and it has become the most current trend, forcing educators to evaluate the merits and limitations of a new technology. Changes in technology continue to alter possibilities for learning and create new challenges for pedagogy. Therefore, the objective of this project is to design a mobile application that allows active and synchronous learning process between students and educators in and outside classes. Content design is widely taken into consideration during the design process. The current project emphasis is on subjects for university students and their acceptance and performance after using the designed mobile application. For the research methodology, this project focuses the agile development methodology. A qualitative research acquired from the feedback of students and their experience in using existing systems through questionnaires and survey and their opinions of the existence of the new application as a method of learning.

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APPROVAL SHEET

This thesis is submitted to the Faculty of Computer Science and Information Technology of Universiti Putra Malaysia and has been accepted as fulfillment of the requirements for the degree of Master of Computer Science.

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DECLARATION

I hereby confirm that:

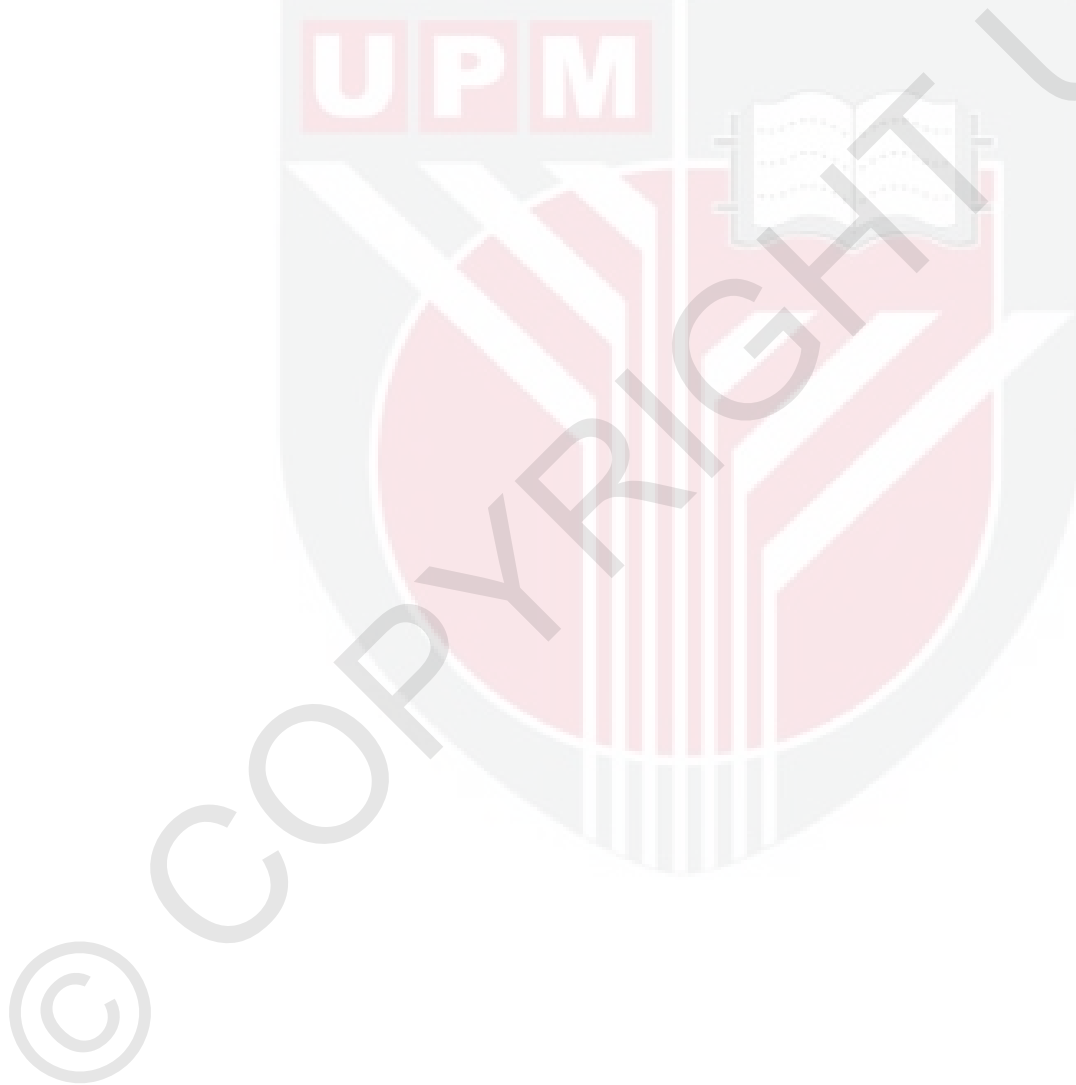
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CHAPTER 1

INTRODUCTION

1.1 Overview

Advanced mobile devices such as smart phones and tablets are currently very popular amongst people mostly because they let people communicate and get information while being on the go. Due to the high increasing rate of mobile users [1] and business opportunities, the mobile device industries have been rapidly developing devices that are able to function at multiple levels. For example, a mobile device may be able to make calls, but they are also able to function as a GPS or a health monitoring device at the same time. The application development for mobile devices has gone back more than 10 years since the emergence of the first IBM Smartphone. Since then, many comprehensive programming environments have been made available for the major mobile platforms. The tasks of implementing a mobile application have been greatly simplified by these powerful development tools. On the other hand, it has become necessary to apply software engineering process towards the development of high-quality mobile applications as they have become able to adapt to multiple functionalities. Mobile devices currently have moved on from supporting inexpensive recreational applications to more business-critical uses. While many “classic” software engineering techniques such as the waterfall technique will transfer easily to the mobile application

domain, there are other areas such as medical, business and agriculture, which still need deeper research and development [4] in the mobile application section.

One of the research areas that are garnering interest in mobile application content development is the learning domain. Over the last two decades, learning institutions have become accustomed to and utilized the Internet, email, instant messaging, course management software, and much more to assist them in teaching and communicating with students. The growing use of mobile technology at learning institutions is the most current trend forcing educators to evaluate the merits and limitations of a new technology. Changes in technology continue to alter possibilities for learning and create new challenges for pedagogy. However, if not utilized properly, these devices will be a distraction to students, especially in the learning context [3].

Various e-learning solutions and related tools have been produced but mobility and interactivity is still a lacking quality in e-learning. In light of this, there is a need for educators and institutions to consider the implications of the use of mobile devices in the teaching and learning environment. In such environment, having an enhanced design [2] and providing an educational mobile application in learning not only create a better learning environment for students but also increase their motivation for learning.

1.2 Problem Statement

The limitation to a mobile device is a challenge itself to developing a mobile application in an educational context. Mobile devices typically have a smaller display and different styles of user interaction. This impacts the interaction design for mobile applications, which leads to impact on the whole development process. The mobile user interface paradigm is based around widgets, touch, physical motion, and keyboards (physical and virtual) rather than the familiar WIMP (Windows, Icons, Menus, Pointer) interface style of Android OS and Microsoft Windows. User interfaces may be replicated from their traditional web application but it is presumed to be redesigned [21] to ensure optimum use of the screen and the mobile user interface paradigm, including both the user input and the associated motion and location information.

Another limitation of current educational mobile applications is the lack of interactivity. While research shows that most students are more comfortable in passive learning, they yearn for concise directions on everything from assignments and assessments to when and how to access course information [22]. Collaborative technologies can also support [23, 24] social construction of learning, assessment, motivation, differentiation and personalization of, and engagement in learning for students; but they are usually poorly implemented or not incorporated at all [22] in educational applications.

There is also a growing need for students to move out of classroom and formal learning [25] due to the growth of mobile devices. Students are expecting the ability to work and learn while being on the go is applied in their learning process. Immediate access to information has proven to have many benefits in many learning and professional contexts.

1.3 Objective

Mobile devices are not originally built for learning purposes. However, many factors of mobile devices such as mobility, connectivity to the internet, ease of use are highly beneficial to the learning environment. Current software engineering methods may be adapted to mobile application content design but they do present several requirements and limitations, as explained in Section 1.2, that are less commonly found in conventional software content design process. Based on that, the objective of this project is;

- To study the design principles and requirements in developing m-learning course content.
- To propose the suitable m-learning course content prototype that allows active and synchronous learning process between students and educators based on the identified requirements and principles.
- To validate the prototype design in a learning environment.

1.4 Project Scope

This study focuses on the design principles and requirements in developing a mobile application for educational content. The expectation of the prototype is to have a design that provides an enhanced experience for educational content. This study aims to create an enhanced learning environment for students but also increase their motivation for learning.

1.5 Project Contribution

Ultimately the main contribution of this study is the mobile learning application prototype to represent the output of the requirements and design principles adopted from best practices in previous studies. Through the usage of the prototype, the active and synchronous learning process between students and educators is explored.

1.6 Thesis Organization

The rest of this paper is organized as follows. Chapter 2 presents a review of literature and relevant research associated with the problems addressed in this study. Chapter 3 presents the methodology and procedures used for the pilot study, data collection and analysis. Chapter 4 contains the requirements and design process of the mobile application prototype that is derived from the results of the pilot study. Chapter 5 elaborates on the procedures for testing and implementation of the mobile application in

its environment. Chapter 6 contains an analysis of the data collected during the testing and implementation period and presentation of the results. Chapter 7 offers a summary and discussion of the student's findings, implications for practice, and recommendations for future research.



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