

ELDERLY HOME CARE MOBILE APPLICATION: INTERFACE DESIGN

AHMAD ZHAFRI BIN ZAIDON

This reported is submitted in partial fulfillment of the requirements for the Bachelor
of Computer Science (Media Interactive)

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2014

DEDICATION

Praise to the almighty Allah S.W.T

To my family, thank you for your support and advice, give strengths, and the important one is always pray for me to complete my final year project

To my supervisor, thank you for a lot of idea, suggestion, and give me a chance to do this final year project perfectly. Thank you very much to Mr Shahril bin Parumo

To my friends and others people, thanks to all of you because help, give some spirit from starting until finish my project,

ACKNOWLEDGEMENT

First for most give my thanks and Alhamdulillah to Allah S.W.T for healthy, spiritual chance and everything to complete this “Projek Sarjana Muda” for the Bachelor in Computer Science (Interactive Media).

First of all special thanks to my family for giving support from starting until complete the project. And I would like to give my thanks to Mr. Shahril bin Parumo as my supervisor, for his experience sharing, guidance, encouragement and idea during the whole project.

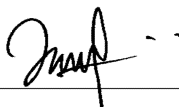

Special thanks to my friends for being a great competitor and partner by giving the help when needed. Not forget to the people who help intentionally or unintentionally during this project ongoing.

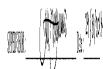
Finally, thanks to Universiti Teknikal Malaysia Melaka, especially Faculty of Information and Technology, and Rumah Seri Kenangan Cheng for giving the facilities and platform to complete this project.

DECLARATION

I hereby declare that this project report entitled
ELDERLY HOME CARE MOBILE APPLICATION: INTERFACE DESIGN

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

STUDENT : _____  Date : 29/8/2014
(AHMAD ZHAERI BIN ZAIDON)
SUPERVISOR : _____  Date : 29/8/2014
(SHHRIL BIN PARUMO)


REKORSAH

ABSTRAK

Kini, penggunaan aplikasi untuk warga tua telah berkembang dan diperbaharui mengikut kepada keperluan pengguna. Aplikasi mudah alih EHC akan dibangunkan mengikut kesungguhan dan teknik yang telah di pelajari berdasarkan kepada kelemahan dan kekurangan daripada pengguna. Dengan penghasilan aplikasi mudah alih EHC ini ia akan membantam untuk mempermudah proses kerja harian berinteraksi antara penghuni dan penjaga di dalam rumah jagaan orang tua. Pemilihan bahan yang sesuai untuk membangunkan aplikasi ini dan bagaimana aplikasi ini mampu menarik perhatian warga tua diperbincangkan secara intensif. Selain itu aplikasi ini mampu mempertingkatkan proses sistem asal yang digunakan oleh organisasi. Hasil daripada ujian yang dijalankan diperbincangkan dan ia menunjukkan rekabentuk antaramuka yang di cadangkan diterima oleh pengguna.

TABLE OF CONTENTS

CHAPTER	SUBJECT	PAGE
	DECLARATION	i
	DEDICATION	ii
	ACKNOWLEDGEMENT	iii
	ABSTRACT	iv
	ABSTRAK	v
	TABLE OF CONTENTS	vi
	LIST OF TABLES	xii
	LIST OF FIGURES	xiii
	LIST OF ABBREVIATION	
CHAPTER I	INTRODUCTION	1
	1.1 Introduction	1
	1.2 Project Background	1
	1.3 Problem Statement	3
	1.4 Objective	4
	1.5 Research Question	4
	1.6 Project Scope	4
	1.6.1 System	4
	1.6.1 User	4
	1.7 Project Significant	5
	1.8 Conclusion	5

CHAPTER II	LITERATURE AND METHODOLOGY	6
	2.1 Introduction	6
	2.2 Facts and Finding	7
	2.2.1 Domain	8
	2.2.2 Existing	8
	2.2.2.1 Mobile application	8
	2.2.2.1.1 Hybrid App	9
	2.2.2.1.2 Native App	10
	2.2.2.2 Operating System	10
	2.2.2.2.1 Android	10
	2.2.2.2.2 Ios	11
	2.2.2.2.3 BlackBerry OS	11
	2.2.2.3 Mobile Device	12
	2.2.2.3.1 Smart Phone	13
	2.2.2.3.2 Tablet Computer	13
	2.2.2.4 Elderly	14
	2.2.2.4.1 Cognitive Complexity	14
	2.2.2.4.2 Loss of Control	15
	2.2.2.5 Application for Elderly	15
	2.2.2.5.1 Mobile Application for Elderly	16
	2.2.3 Comparison of Existing System	16
	2.2.3.1 Current Application for Elderly	17
	2.2.3.1.1 Pill Reminder Pro	17
	2.2.3.1.2 Dragon Dictation	18
	2.2.3.1.3 Phonotto	19
	2.2.3.1.4 Voucherloud	20
	2.3 Project Methodology	21
	2.3.1 The Active Involve of User	21
	2.3.2 Iteration of Design Solution	21
	2.3.3 Multi-disiplinary Design Teams	22
	2.4 Project Requirements	24
	2.4.1 Software Requirement	24
	2.4.1.1 Adobe Flash	24

2.4.1.2	Adobe Photoshop	25
2.4.1.3	Adobe Illustrator	25
2.4.1.4	Microsoft Office 2010	25
2.4.2	Hardware Requirement	26
2.4.2.1	Notebook HP	26
2.4.2.2	HTC Sensation Xe	26
2.4.2.3	Samsung Galaxy Tab10.1	26
2.4.2.4	Speaker / Headset	27
2.4.2.5	Canon Printer	27
2.4.3	Other Requirement	27
2.4.3.1	Case Study	27
2.4.3.1	Case Study	27
2.4.3.2	Server	27
2.5	Project Schedule and Milestones	28
2.6	Summary	28
CHAPTER III	ANALYSIS	29
3.1	Introduction	29
3.2	Current Scenario Analysis	29
3.2.1	Comparison Between Project With Existing Game	30
3.3	Requirement Analysis	31
3.3.1	Project Analysis	31
3.3.2	Mobile Application	31
3.3.3	Need Analysis	31
3.3.4	User Analysis	31
3.3.5	Technical Analysis	32
3.4	Requirement Gathering	32
3.4.1	Gather Requirement (questionnaire)	32
3.4.2	Questionnaires	33
3.4.3	First Trip Questionnaire (problem solving)	34
3.4.4	Second Trip Questionnaire (icon design)	36

3.5 Analyze Requirement	40
3.5.1 Analyzed Requirement (problem solving)	40
3.5.2 Analyze Requirement (icon design)	41
3.5.3 Analyze Requirement (color)	41
3.5.4 Design Prototype	42
3.6 Conclusion	43
CHAPTER IV DESIGN	
4.1 Introduction	44
4.2 System Architecture	45
4.3 Preliminary Design	46
4.3.1 Affect	46
4.3.2 Feature	47
4.3.3 Storyboard Design	48
4.3.4 Icon	50
4.4 User Interface Design	50
4.4.1 Navigation Design	51
4.4.2 Input Design	53
4.4.3 Output Design	53
4.4.4 Database Design	53
4.4.5 Metaphor	54
4.4.6 Template Design	56
4.4.7 Media Creation and Integration	58
4.4.7.1 Graphic	59
4.4.7.2 Action Script	61
4.4.7.3 Audio	63
4.4.7.4 Animation	65
4.4.8 Uploading Files	67
4.4.8.1 Insert Data into Database	67
4.5 Conclusion	68

CHAPTER V	IMPLEMENTATION	
5.1	Introduction	69
5.2	Media Creation	70
5.2.1	Production of Text	70
5.2.2	Production of Graphic	71
5.2.3	Production of Audio	72
5.2.4	Production of Animation	72
5.3	Media Integration	73
5.4	Conclusion	74
CHAPTER VI	TESTING AND EVALUATION	
6.1	Introduction	75
6.2	Test Plan	76
6.2.1	Test User	76
6.2.2	test Environment	77
6.2.3	Test Schedule	78
6.3	Test Strategy	78
6.3.1	Unit Testing	79
6.4	Test Design	79
6.4.1	Test Description	79
6.4.2	Segment 1	80
6.4.3	Segment 2	80
6.4.4	Segment 3	81
6.4.5	Segment 4	81
6.4.6	Segment 5	82
6.5	Test Data	82
6.6	Test Result and Analysis	86
6.6.1	Icon Design	86
6.6.2	User Interface	88
6.6.3	System Understanding	89
6.5	Conclusion	91

CHAPTER VII CONCLUSION	
7.1 Introduction	92
7.2 Observation on Weaknesses and Strengths	93
7.2.1 Strength	93
7.2.2 Weakness	94
7.2.3 Proposition for Improvement	94
7.3 Contribution	95
7.4 Conclusion	95
REFERENCES	96
APPENDICES	99

LIST OF TABLES

TABLE	TITLE	PAGE
Table 2.1	Activity Schedule	28
Table 3.1	Table Comparison	30
Table 4.1	Storyboard design	48
Table 4.2	Metaphor	54
Table 6.1	Schedule of Testing Activity	78
Table 6.2	Result from Bahagian 1 Soalan A (with briefing)	83
Table 6.3	Result from Bahagian 1 Soalan B (without briefing)	83
Table 6.4	Shows the result from Bahagian 2	84
Table 6.5	Shows the result from Bahagian 3	84
Table 6.5	Shows the result from Bahagian 3	84
Table 6.6	Shows the result from Bahagian 5	84
Table 6.7	Shows the result from Bahagian 6	85
Table 6.8	Shows the result from Bahagian 7	85

LIST OF FIGURES

FIGURE	TITLE	PAGE
Figure 2.1	Pill Reminder Pro Interface	17
Figure 2.2	Dragon Dictation Interface	18
Figure 2.3	Phonotto Interface	19
Figure 2.4	Voucherloud Interface	20
Figure 2.5	UCD Development Model	22
Figure 4.1	System Architecture	45
Figure 4.2	Icon	50
Figure 4.3	Interface Navigation Flow	51
Figure 4.4	System Navigation Flow	52
Figure 4.5	Database Structure	53
Figure 4.6	Template Design for Background	57
Figure 4.7	Icon Template Design	57
Figure 4.8	Text Template Design	58
Figure 4.9	Icon in EHC Mobile Application	60
Figure 4.1.2	Action Script 3.0 Declaration	61
Figure 4.1.3	Action Script 3.0 Create Event for Icon	62
Figure 4.1.4	Action Script Change Directory	63
Figure 4.1.5	Action Script To Declare Sound	64
Figure 4.1.6	Action Script to Play Sound	64
Figure 4.1.7	Animation Creation	65
Figure 4.1.8	Animation Process	66
Figure 4.1.8	register1.php file	67
Figure 4.1.9	Connection.php	68
Figure 5.1	Creating Graphic	70

Figure 5.2	Creating Graphic	71
Figure 5.3	Editing Image	71
Figure 5.4	Produce Sound	72
Figure 5.5	Produce Animation	73
Figure 6.1	Location for Testing	77
Figure 6.2	Shows the result of questionnaire (Bahagian 1)	86
Figure 6.3	Shows the result of questionnaire (Bahagian1, without briefing)	87
Figure 6.4	Shows the result of questionnaire (Bahagian 2)	88
Figure 6.5	Shows the result for question (Bahagian 6)	89
Figure 6.6	Shows the result for quation (Bahagian 7)	90

LIST OF ABBREVIATION

PSM	-	Projek Sarjana Muda
EHC	-	Elderly Home Care
RSK	-	Rumah Seri Kenangan
UTeM	-	Universiti Teknikal Malaysia Melaka

CHAPTER 1

INTRODUCTION

1.1. Introduction

This project is a requirement for student taking the subject BITU 3973 Projek Sarjana Muda I (PSM I) and BITU 3983 Projek Sajana Muda II (PSM II). In this project, a mobile application product will be developed, focusing on application interface of the elderly home care known as EHC. The Flash software will be used to create the interface for this mobile application to give elderly user use in easy way and easy to understand the interface of application. This technology is widely used in heritage and archaeology, to develop games and learning.

1.2. Project Background

Elderly Home Care (EHC) Mobile Application is a mobile application that will be developed for the purpose of enhancing the elderly to communicate with the caregiver in the elderly home care organization. This project helps to make the interaction between home care resident and caregiver a lot more efficiently. The EHC project are divided into two main parts, which are user, and admin. The user is for senior citizen or home care resident that will be using the mobile application and

the admin is for the caregiver or home care staff that will be using computer or other devices which are connected to the server. The mobile application will help the home care resident to notify the caregiver of any helps quickly and easily. The resident simply select what type of help that he or she enquired from the caregiver simply by a touch on the screen of the mobile application device and the caregiver would be notify of the enquiry as a pop up message in the admin devices.

The main objective of EHC Mobile Application is to study the ability and disability of the target user, and developed the application that satisfies their needs. The EHC Mobile Application interface will be developed based on the researches that have already been conducted by referring through their main idea, survey, article and conducting a questionnaire. Many senior citizens were not pleased in using mobile application because of complex interfaces that were design for younger range of users. During research, the concern of EHC Mobile application was about the interfaces design, such as size of button, color, symbol and arrangement of the interfaces. After the analysis and designing of the project, the most suitable mobile application interfaces are shown to the elderly resident.

EHC Mobile Application will be developed using suitable software for the application platform and designing the application interfaces to get high quality design. For the application hardware platform, the EHC will be running on mobile tablet and computer for the user to interact to the application. To enable connection between user and admin EHC device, a server will be used as a medium to connect the devices using mobile hotspot, router and other hardware that are compatible with this application.

1.3. Problem Statement

In elderly home care, the caregivers have schedules to follow which sometimes limits the caregiver to do a check-up for every home care resident health condition. This create a situation where the caregiver will unable to respond quickly to an accident or emergency situation that might occur while the caregivers not around the resident such as heart attack, falling of bed and other emergency needs that the resident might enquire.

Now days the usage of application is widely used in daily basis but not for Elderly community. This are due to the fact that majority of elderly people find it hard to copes with new technology product especially mobile application. The main reason why is their aged-related problem. Today software interface do not design regarding older users characteristic. Moreover, most of the software is designed to support younger people or based on younger experience. Most of people think the design for elderly people is simple and big button, it's actually not enough to let older users use software effectively.

The efficiency of the synchronization connection between home care resident and caregivers is important. It's should be improve from current system, where currently the caregiver gets notify late and sometime miss understanding the type of help needed. It's different between emergency and normal situation such as when elderly happen to undergoes a heart attack, this kind of situation are needed to be handled quickly from staff. Current system will take much longer time to notify the caregiver of the dire situation which is needed to be handled quickly in some situation. By using EHC Mobile Application, home care resident can send the request for help or emergency by a mobile device and the data will be transfer through the server and into the caregiver device as an alert message of the request. This will reduce time to get help and notify the caregiver of any situation including emergency.

1.4. Objective

- To study the interface design for EHC mobile application to developed mobile application for elderly user.
- To design and develop a prototype for EHC mobile application for elderly base on the requirement
- To evaluate the prototype for EHC mobile application (mainly on interface) for elderly user.

1.5. Research Question

- What is the best interface for elderly user
- How the interface provide ease for elderly user to use the mobile application

1.6. Project Scope

1.6.1. System

- Elderly home care application

1.6.2. User

- Senior citizen(Elderly home care resident)
- Care giver home care

1.7. Project Significant

Nowadays, mobile application is widely used in daily life. Many applications were made for mobile usage. Those who know mobile application often said that it is trendy but some there are many people that unfamiliar with it and difficult to use especially senior citizen. Throughout this project, the hidden capabilities of mobile application can be revealed apart from the ones that have been introduced in class. Gradually, mobile application will be recognized by senior citizen user and develop for elderly home care use.

Apart from this project, who are elderly not familiar with mobile application, especially EHC mobile application are able to explore and experience in mobile gadget. This project enables user of resident home care to use the application to needed help from care givers. This project also to get the information from elderly to get the best result in mobile application interface based on the requirement.

1.8. Conclusion

This project will be developed based on the problem statements, objectives, scope and project described in previous section. The expected result of this project is the application itself, EHC, a mobile application using adobe flash technique. The objectives that are need to be achieve in developing this mobile application are to help elderly home care resident achieve and to provide interactive and useful interface for them. The methodology that will be used in order to complete this project is User Centered Design

CHAPTER 2

LITERATURE REVIEW AND METHODOLOGY

2.1. Introduction

The uses of technologies are widely used in baby care to facilitate parents and baby caregiver. Based on this technology concept, it can be develop for elderly care. This literature review will study how to develop the mobile application for elderly home care. This is because not only baby need to be a monitored but elderly also need it. This worldwide increase in the elderly patient's population and disease infection rate is an issue to give them care, fulfill their needs and requirement according to their expectations and provide them facilities to communicate such as mobile application. Due to this situation mobile application could play a significant role to remove the communication gap between elderly and care. Furthermore in this modern era, elderly citizen should not be left behind the in technology usage. This chapter will look at problems faced by the elderly, what is the suitable mobile application for elderly. Besides that, this chapter will see the current application in market. Most of the mobile applications that developed by vendor were based on requirement and their own suitable for elderly usage.

This project will identify the mobile application standard that available in the market for elderly. Beside that it also investigates the mobile application user, which can be used for elderly.

This chapter will explain about the method to develop the interface design for EHC Mobile Application. From this chapter it will cover up about the research activities that had been processed to collect all the data from the study area to make analysis based on the result. Other than that, this chapter will briefly explain about methodology development process which is (User Centered Design) UCD. Equipment requires like hardware and software also will be listed and final of this chapter will discuss on the requirement analysis of EHC Mobile Application.

2.2. Facts and Finding

A mobile application is a term that explains about software that can be used on smartphone, tablet or other device. Mobile application usually helps people by making easier to use the application. Mobile application are designed with element for the demands of the devices and advantage by the size, wireless devices compare with desktop and laptop computers.

Nowadays mobile application is very familiar but not for most elderly group. This project will help to increase the usage of the mobile application. This project able to evaluate the elderly user experience using the mobile application

2.2.1. Domain

The domain for this project is mobile application. This project will be test or use by elderly citizen. Besides that, this application will be runs on mobile devices such as tablet, smart phone, and kiosk. This application need to install before use the system. This application will be design for elderly user standard. Problem of the elderly citizen are categorized for every part in further research.

This project will focus on the application interfaces to attract the elderly to use the technology. Important thing in this project is need to make a good decision for elderly easy to use the application. To achieve project goal, EHC mobile application must have good interface based on research.

2.2.2. Existing System

System or process that are already developed or implemented in the current organization.

2.2.2.1. Mobile Application

Nowadays, mobile app or mobile application is application software designed to run on smartphone, tablet or other mobile devices. Mobile application the handheld device as well as can be downloaded by users from application. Various platforms that support mobile application are Windows Mobile, Android, Symbian, Java ME and Palm.