

SIMPLE MOBILE ORDERING SYSTEM FOR RESTAURANT
WITHIN WI-FI NETWORK

ABU FIRAZ BIN SHAMSHUL KAMAL

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

Fakulti Kejuruteraan Elektronik dan Kejuruteraan Computer
Universiti Teknikal Malaysia Melaka

June 2012



UNIVERSITI TEKNIKAL MALAYSIA MELAKA
FAKULTI KEJURUTERAAN ELEKTRONIK DAN KEJURUTERAAN KOMPUTER

BORANG PENGESAHAN STATUS LAPORAN
PROJEK SARJANA MUDA II

Tajuk Projek : SIMPLE MOBILE ORDERING SYSTEM FOR RESTAURANT WITHIN WI-FI NETWORK

Sesi Pengajian :

1	1	/	1	2
---	---	---	---	---

Saya ABU FIRAZ BIN SHAMSHUL KAMAL

(HURUF BESAR)

mengaku membenarkan Laporan Projek Sarjana Muda ini disimpan di Perpustakaan dengan syarat-syarat kegunaan seperti berikut:

1. Laporan adalah hakmilik Universiti Teknikal Malaysia Melaka.
2. Perpustakaan dibenarkan membuat salinan untuk tujuan pengajian sahaja.
3. Perpustakaan dibenarkan membuat salinan laporan ini sebagai bahan pertukaran antara institusi pengajian tinggi.
4. Sila tandakan () :

SULIT*

*(Mengandungi maklumat yang berdarjah keselamatan atau kepentingan Malaysia seperti yang termaktub di dalam AKTA RAHSIA RASMI 1972)

TERHAD**

** (Mengandungi maklumat terhad yang telah ditentukan oleh organisasi/badan di mana penyelidikan dijalankan)

 /

TIDAK TERHAD


 (TANDATANGAN PENULIS)

Disahkan oleh:



 (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 hereby declare that this report is the result of my own except for quotes as cited in this references.”

Signature : 

Author : ABU FIRAZ BIN SHAMSHUL KAMAL

Date : 15/6/12

“I hereby declare that I have read this report and in my opinion this report is sufficient in term scope and quality for the award of Bachelor of Electronic Engineering (Computer Engineering) with Honors.”

Signature : 

Supervisor's Name : LIZAWATI BINTI SALAHUDDIN

Date : 15/6/12

For my beloved mother and father

ACKNOWLEDGEMENT

Firstly, praise to Allah S.W.T. for guiding and blessing with perseverance and strength to complete the project. This project will not be possible without the participation of many people. No matter how much work the author put into a project, there are always others who provide valuable guidance and information that enable the completion of the project. First of all, 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 offered me very sound advice and pushed me to finish this project on time. 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.

ABSTRAK

Pada masa kini, ramai orang mencari aplikasi yang dapat memudahkan dan melancarkan kehidupan mereka. Manakala, dalam industri restoran makanan segera, kebanyakan majikan mencari aplikasi bergerak yang dapat meningkatkan fungsi perniagaan mereka terhadap pelanggan serta meningkatkan keuntungan terutamanya semasa waktu puncak. Pada waktu puncak, restoran akan menjadi sangat sibuk dan pelanggan terpaksa beratur dalam jangka masa yang lama. Oleh itu, sistem ringkas pesanan bergerak (SMOS) dicipta untuk mengatasi isu-isu yang dihadapi oleh industri restoran. Objektif ini disokong oleh beberapa sub objektif iaitu untuk menimba ilmu pengetahuan tentang Adobe Integrated Runtime (AIR), merekabentuk SMOS dengan kesilapan minimum dan membangunkan sistem yang menunjukkan navigasi SMOS. Dalam projek ini, metodologi berstruktur iaitu model air terjun telah dipilih untuk membangunkan SMOS. Metodolologi ini terdiri daripada analisis sistem, reka bentuk sistem, pembangunan sistem dan ujian sistem. Hasil daripada projek ini ialah berkaitan tentang sistem aliran asas dan prototaip SMOS yang terdiri daripada modul pelanggan, modul kaunter, modul dapur dan modul paparan. Kesimpulannya, SMOS dapat menangani masalah-masalah utama dalam proses pesanan dan pengurusan restoran dengan mengurangkan masa pelanggan dan masa pengurusan semasa proses pesanan makanan.

ABSTRACT

Nowadays people are looking forward for an application that makes life easier and faster. While in fast food restaurants industries, most businesses people look for any mobile application that improve their business functions for the customers as well as increased the profit especially during peak hour. During the peak hour period, the fast food restaurant will be very hectic and customers have to queue in a long period. Hence, Simple Mobile Ordering System (SMOS) is developed due to the issues facing by the fast food restaurant industry. This objective is supported by some sub objectives which are to gain knowledge about Adobe Integrated Runtime Technology (AIR), design SMOS with minimum errors and develop the system which demonstrate the navigation of the SMOS. For this project, the structured methodology which is waterfall model has been chosen to develop the SMOS. The methodology used involved system analysis, system design, system development, and system testing. The system result is described by basic flow system and SMOS prototype which consists of customer module, counter module, kitchen module and display module. In conclusion, SMOS address major problems in ordering process and restaurants management by reduce the customer's time and the management's time for food ordering process.

CONTENTS

CHAPTER	TITLE	PAGES
	PROJECT TITLE	i
	DECLARATION	ii
	DEDICATION	v
	ACKNOWLEDGEMENTS	vi
	ABSTRAK	vii
	ABSTRACT	viii
	CONTENTS	ix
	LIST OF FIGURES	xiii
	LIST OF ABBREVIATIONS	xv
	LIST OF APPENDICES	xvi
I	INTRODUCTION	
	1.1 Introduction of Project	1
	1.2 Objectives of Projects	4
	1.3 Problem Statements	4
	1.4 Scopes of Project	5
	1.4.1 Operability for Customer Module	5
	1.4.2 Operability for Counter, Kitchen and Display Modules	5

1.4.3	Functionality for Customer Module	6
1.4.4	Functionality for Counter Module	6
1.4.5	Functionality for Kitchen Module	6
1.4.6	Functionality for Display Module	6
1.4.7	User for Customer and Display Module	6
1.4.8	User for Counter Module	6
1.4.9	User for Counter Module	6
1.5	Methodology	7

II LITERATURE REVIEW

2.1	Mobile and Handheld Device	8
2.3	Review of Food Ordering System	10
2.3.1	Manual Food Ordering System	10
2.3.2	Mobile Food Ordering System	10
2.4	Architecture of Mobile Food Ordering System (MFOS)	11
2.5	Benefits of Mobile Food Ordering System	12
2.6	Limitation of Mobile Food Ordering System	13
2.7	Wireless Network	13
2.8	Advantages and Disadvantages of Wireless Network	14
2.9	Demands for Fast Food Operation	14
2.10	Adobe AIR	15

III METHODOLOGY

3.1	System Analysis	17
-----	-----------------	----

3.1.1	Research and Site Visit	17
3.1.2	Observation	18
3.1.3	View Existing Documentation	18
3.2	System Design	18
3.2.1	File Level Design	18
3.2.2	Screen Level Design	19
3.2.3	Program Level Design	19
3.3	System Development	19
3.3.1	Development Tools	20
3.3.1.1	Adobe Flash Builder 4.6	20
3.3.1.2	Adobe Photoshop CS5	22
3.3.1.3	Adobe Flash Professional CS5.5	23
3.3.1.4	WampServer	24
3.3.2	Programming Languages	25
3.3.2.1	MXML	25
3.3.2.2	PHP	26
3.3.2.3	Unified Markup Language (UML)	26
3.4	System Testing	27
3.4.1	Testing Approach	28
3.4.1.1	Functional Test	28
3.4.1.2	Unit Testing	28
3.4.1.3	Integration Testing	28
3.4.1.4	Regression Test	29
3.4.2	System Requirements	29

IV RESULT AND DISCUSSION

4.1	Use Case Diagram	31
-----	------------------	----

4.2	Preconditions	33
4.3	Basic Flow Event	33
4.4	Alternative Flow	34
4.5	Post-Conditions	34
4.6	Special Requirement	35
4.7	Swimlanes Diagram for Basic Flow	35
4.8	SMOS Prototype	36
4.8.1	Customer Module	36
4.8.2	Counter Module	43
4.8.2.1	Customer Registration View	44
4.8.2.2	Food Management View	45
4.8.2.3	Order Management View	46
4.8.2.4	Payment View	47
4.8.3	Kitchen Module	48
4.8.4	Display Module	49
4.9	Database	50
4.10	Discussion	54

V CONCLUSION

5.1	Conclusion	56
5.2	Recommendation and Suggestion for Future Research	57

REFERENCES 58

APPENDIXES 60

LIST OF FIGURES

NO	TITLE	PAGES
1.1	Common ordering process	2
1.2	SMOS process	3
2.1	MFOS system architecture	11
2.2	Adobe AIR application structure	15
3.1	Waterfall model	17
3.2	Adobe Flash Builder 4.6	20
3.3	Adobe Photoshop CS5	22
3.4	Adobe Flash Professional CS5.5	23
3.5	WampServer	24
3.6	Hello World MXML Example	25
4.1	SMOS Use Case Diagram	32
4.2	Active Network Area	33
4.3	SMOS Swimlanes Diagram	35
4.4	SMOS Flowchart for Customer Module	37
4.5	Login View in Customer Module	38
4.6	Menu View	39
4.7	Order Confirmation	40
4.8	Receipt View	41
4.9	Ready Notification	42
4.10	Counter Module	43

4.11	Customer Registration View	44
4.12	Food Management View	45
4.13	Order Management View	46
4.14	Payment View	47
4.15	Status View	48
4.16	Kitchen View	49
4.17	fastrest Database	50
4.18	history Table	51
4.19	reg_food Table	52
4.20	reg_user Table	53
4.21	Common Ordering Process	54
4.22	SMOS Process	55

LIST OF ABBREVIATIONS

SMOS	-	Simple Mobile Ordering System
AIR	-	Adobe Integrated Runtime
PHP	-	Hypertext Preprocessor
IDE	-	Integrated Development Environment
PDA	-	Personal Digital Assistant
MFOS	-	Mobile Food Ordering System
WSDL	-	Web Service Description Language
GIMP	-	GNU Image Manipulation Program
GUI	-	Graphical user interface
RDBMS	-	Relational Database Management System
LAMP	-	Linux, Apache, MySQL, PHP/Perl
WAMP	-	Windows, Apache, MySQL, PHP/Perl/Python
MAMP	-	Mac, Apache, MySQL, PHP
UML	-	Unified Markup Language
RHEL	-	Red Hat® Enterprise Linux

LIST OF APPENDICES

NO	TITLE	PAGES
A	Source Code for Customer Module	60
B	Source Code for Counter Module	87
C	Source Code for Kitchen Module	115
D	Source Code for Display Module	131

CHAPTER I

INTRODUCTION

Chapter 1 covers the introduction part of this Final Year Project of Degree. It contains subchapters of objectives, problem statements, scopes of project and methodology.

1.1 Introduction of Project

With the rapid growth of mobile technology, nowadays people are looking forward for an application that makes life easier and faster. While in fast food restaurants industries, most businesses people look for any mobile application that improve their business functions for the customers as well as increased the profit. Normally in manual system, human error, waiting time, wasting foods, wrong menu preparation, ordering management and menu selection are the main issues in any restaurants. This thesis presents the integration of mobile technology for simple mobile ordering system (SMOS) for fast food restaurants which may solve these issues. A prototype of SMOS was developed to enable the users; administrator, kitchen staffs and customers to manage menu, manage user, manage bill configuration, manage menu order, manage serve order, view order, and manage billing. This prototype implements wireless data access by the users using mobile

devices such as smart phone. It is aimed to provide an effective and efficient way for the customers and the staffs of the restaurants to do the ordering process. It also saves time, improve business management and reduce human errors.

Businesses based on food services have grown significantly in Malaysia in the last decades where many fast food restaurants opened and offered various types of menu for customers. The restaurants consistently improve their food ordering system because this is the way of interaction between restaurants and customers. Typically there are almost same for food ordering process in different fast food restaurant but all requires the coordination of some tasks. Figure 1.1 shows the common ordering process in the fast food restaurants.

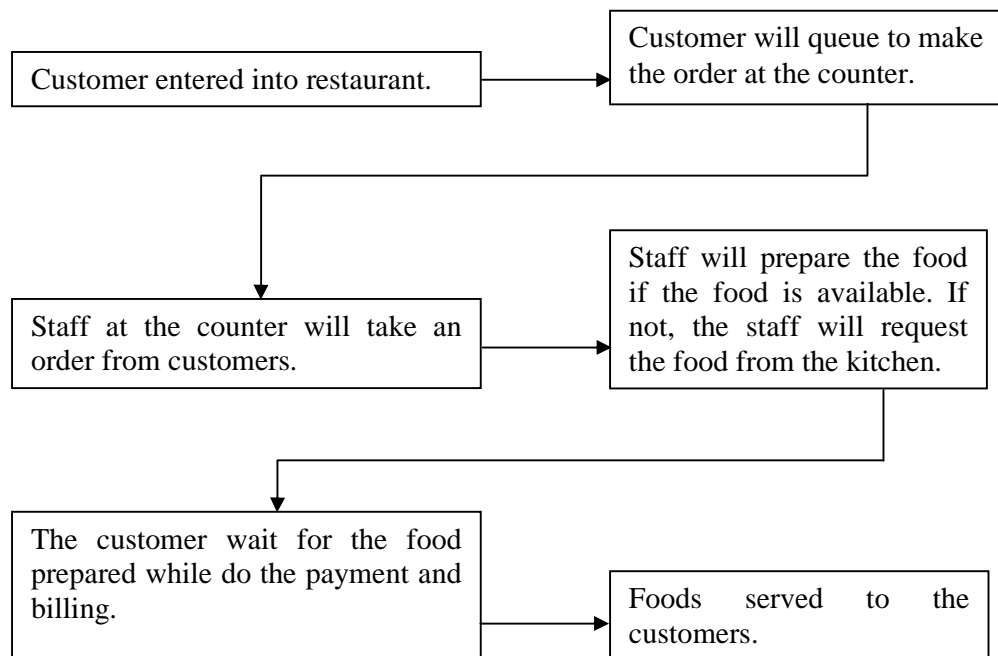


Figure 1.1: Common Ordering Process

Thus, with the technology changed, mobile computing has become more popular and demanding amongst the users especially in a food services business and helps improving people's businesses and lifestyle. It embraces a host of portable technologies that makes system access on the go not only possible, but integral to everyday life. Wireless and handheld devices allowed one to one computing, instant

communication and everywhere accessed to the users. Mobile computing are widely use in education, business, entertainment, tourism, transportation and medical. The convenience and powerful functionality offered by mobile devices such as iPhone, or smart phones have encouraged many people to investigate the benefits of using them. The implementation of mobile computing in businesses helps increase profit and decrease the operational cost for the food services businesses. This facility gives an opportunity to the businessman to improve their services to the customers.

SMOS is a new application which can help the business people to run their business and provide the services in an effective way within a time allocation. Basically, the system has two user's views; mobile view for the customers and computer view for the management staffs and other staffs. The system can help the staffs to work in an effective way and provide good services to the customers. The main functionality of proposed SMOS is shown in Figure 1.2:

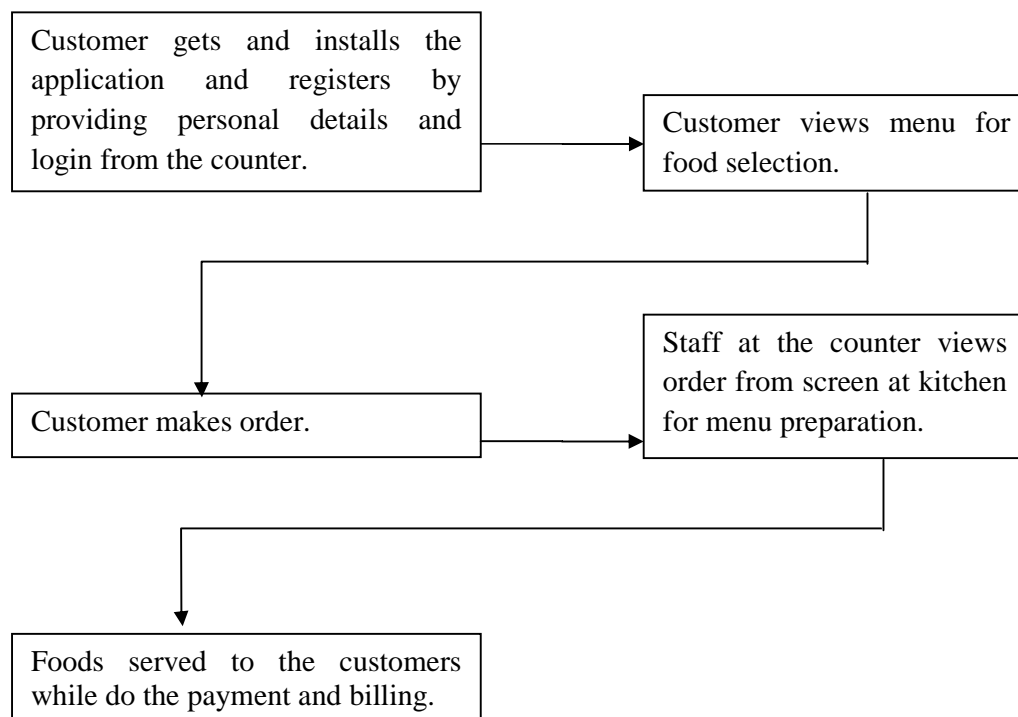


Figure 1.2: SMOS Processes

1.2 Objectives of Projects

The main objective of this study is to develop SMOS for fast food restaurants within Wi-Fi network. This objective is supported by the following sub objectives:

- (a) To gain and develop knowledge about Adobe AIR technology.
- (b) To design the navigation model for SMOS with a minimum errors in a fast food restaurant.
- (c) To develop the system which demonstrate the navigation of the SMOS in a fast food restaurant.

1.3 Problem Statements

During the peak hour period, the fast food restaurant will be very hectic and the conventional ordering system that manually jots down the order are not efficient. This problem can obviously be seen and realized when there is a long queue at the counters. This problems need to be resolved as fast as possible in order to achieve the fast food restaurant mission.

The rapid growths of mobile computing in the business area make customers intend to demand for applications that able to reduce their waiting time for the staff to take an order from the counter. In a medium to large and busy fast food restaurant, it requires an efficient ordering system. When customers intend to select the menu before make an order, they have to refer to the many menu list options which sometimes do not attract them, fulfil their choice and make them difficult to choose, hence, it will increase the waiting period in the queue. Waiting for too long while standing in the queue can make the customer feel so bored and tired. So this system can avoid all that by make the order from their sit through their phone. The application will show the selection options from the list on the menu by using nice and simple interaction. This option will provide an easier selection and give such a pleasure to the customers in enjoying their meals. They also do not have to worry about the other customer in the queue.

Speed is seen to be the major requisite of fast food. It is therefore taken to be food, which is intended to be ready for consumption in less than 15 minutes from ordering. Every second is counted in this fast food business and the food will be a bit out of taste from the original flavor if there is advance preparation of food.

1.4 Scope of Project

This project focuses on developing and implementing mobile food ordering system for the fast food restaurants which is developed using Adobe Flash Builder 4.6 approach using Adobe AIR technology with PHP server integration, an enterprise-class Eclipse™ based IDE, ActionScript 3.0, and Flash. This project scope can be classified into operability, functionality and user for customer, counter, kitchen and display modules.

1.4.1 Operability for Customer Module

- (a) Smart phone that support Adobe Integrated Runtime (AIR) 2.6 or a higher version of AIR.
- (b) AIR 2.6 or a higher version can be installed only on supported Android devices that run Android 2.2 or a higher version.
- (c) For apple products, the program only compatible with iPhone 3GS, iPhone 4, iPod touch (3rd generation), iPod touch (4th generation), and iPad. Requires iOS 3.2 or later.

1.4.2 Operability for Counter, Kitchen and Display Modules

Desktop with Adobe Integrated Runtime (AIR).

1.4.3 Functionality for Customer Module

- (a) Login to the application.
- (b) Make order and confirmation notification.
- (c) View status, ready notification and receipt.

1.4.4 Functionality for Counter Module

- (a) Manage customers.
- (b) Manage foods.
- (c) Manage orders.
- (d) Manage payments.

1.4.5 Functionality for Kitchen Module

Update status orders.

1.4.6 Functionality for Display Module

Display status orders.

1.4.7 User for Customer and Display Module

Customers.

1.4.8 User for Counter Module

Counter staff.

1.4.9 User for Counter Module

Kitchen staff.

1.5 Methodology

A software development methodology or system development methodology in software engineering is a framework that is used to structure, plan, and control the process of developing an information system. For this project, waterfall development method is used.

The Waterfall model is a chronological development advance, in which development is seen as flowing steadily downwards just like a waterfall. The phases are requirements analysis, design, implementation, testing or validation, integration, and maintenance. The details about methodology are discussed in Chapter III.

CHAPTER II

LITERATURE REVIEW

This chapter presents an overview of the previous works on the related topic for providing the background of this study. The discussion starts with the review of mobile and handheld device and history of mobile food ordering system for the restaurants. Discussion on the operation of manual food ordering system is continuing with the architecture of the system through wireless mobile and the limitations of system. Discussion also covers demands for fast food operation.

2.1 Mobile and Handheld Device

According to Lee, Sceinder & Schell [1] Mobile is defined as:

The capability of being able to move or moved easily. Whereas in context of mobile computing, mobile pertains to people's use of portable and functionally powerful mobile devices that offer the ability to perform a set of application functions un-tethered, while also being able to connect to, obtain data from, and provide data to users, applications and system.