


# APPLICATION DEVELOPMENT WITH J2ME FOR MOBILE PHONE (J2ME)

This thesis is presented in partial fulfillment for the award of the  
Bachelor of Electrical Engineering (Honours)  
UNIVERSITI TEKNOLOGI MARA

by — SITINORMIBINTIZABRI SUHAIMI  
Faculty of Electrical Engineering  
 UNIVERSITI TEKNOLOGI MARA  
40450 SHAH ALAM, SELANGOR

## ACKNOWLEDGEMENT

I wish to thank project supervisor, Pn. Aziati Husna Awang and all the interviewees for their inspiration, guidance and willingness to contribute to this thesis.

Second I wish to thank the Faculty of Electrical Engineering at Universiti Teknologi MARA for the facilities during the preparation of this thesis.

Finally the contribution of my friends for their help and valuable comments is very much acknowledged.

Shah Alam, April 2007

Siti Normi Bt Zabri Suhaimi

## ABSTRACT

With m-business technology continuously being taken more into use and introduced in new markets the transition to m-business will make mobile shopping exceedingly popular. In the near future e-shopping and m-shopping will probably replace today's markets or shopping complex.

This thesis proposes software architecture of a mobile ordering system using Java technology. The mobile ordering system (also called as mobile shopping) acts as a supermarket or shopping mall where users can purchase goods. Users can access a service or application through mobile devices and view the available items (in this case, flowers). The application retrieves the information demanded by the users from its data and presents them to the users.

The application has been deployed and run on an emulator (Wireless Toolkit 2.5 Beta) with a DefaultColorPhone as the default emulator. The implemented application was successfully tested and proved to perform satisfactory. However, the work that has been done is a basis for further improvement on design and database implementations. All implementations should then aim to use successfully the J2ME library and run on J2ME enabled virtual machines to be able to use updated and improved technology.

# TABLE OF CONTENTS

ACKNOWLEDGEMENT.....	iv
ABSTRACT.....	v
TABLE OF CONTENTS.....	vi
LIST OF FIGURES.....	ix
LIST OF TABLES.....	x
LIST OF ABBREVIATIONS.....	xi
CHAPTER 1.....	1
1 INTRODUCTION.....	1
1.1 INTRODUCTION.....	1
1.2 BACKGROUND.....	1
1.3 PROBLEM DISCUSSION.....	3
1.4 PURPOSE OF THE PROJECT.....	5
1.5 PROJECT SCOPE.....	6
1.6 ORGANIZATION OF THE THESIS.....	7
CHAPTER 2.....	8
2 LITERATURE REVIEW.....	8
2.1 INTRODUCTION.....	8
2.2 CONCEPT OF M-COMMERCE.....	8
2.3 TYPES OF M-COMMERCE.....	11
2.4 ADVANTAGES AND DISADVANTAGES OF M-COMMERCE.....	12
2.5 MOBILE SHOPPING.....	14
2.5.1 Mobile Retailing.....	15
2.5.2 Mobile Ticket Service Provider.....	16
2.5.3 Mobile Auctions.....	16
2.6 THE BUYING PROCESS OF M-COMMERCE.....	16
2.6.1 Online Shopping Experience.....	18
2.7 TRANSFORMATION OF TRADITIONAL BUSINESS TO ONLINE BUSINESS.....	19
2.8 M-COMMERCE SERVICE TECHNOLOGIES FOR CONSUMER.....	22
2.8.1 Short Message Service (SMS).....	22
2.8.2 Wireless Application Protocol (WAP).....	22
2.8.3 The effect of WAP on Information Services.....	23
2.9 THE OBSTACLES TO ADOPT M-COMMERCE FOR GENERAL USERS.....	23
2.9.1 Security Challenge.....	23
2.9.2 The Mobile Device.....	24
2.9.3 Malicious SMS Messages.....	24
2.9.4 The Radio Interface.....	24
2.9.5 The network operator infrastructure.....	25
2.9.6 The kind of m-commerce application.....	25
2.9.7 Virus Attack.....	25
2.9.8 DoS Attack.....	26
2.10 CUSTOMER TRUST IN M-COMMERCE.....	26
2.10.1 Enhance customer familiarity.....	28
2.10.2 Build vendor reputation.....	28
2.10.3 Deliver high-quality information.....	28*
2.10.4 Elicit third-party recognition and certification.....	29

2.10.5	Provide attractive rewards.....	29
2.11	THE FUTURE FOR M-COMMERCE TECHNOLOGIES.....	29
2.12	CONCLUSION.....	30
CHAPTER 3	.....	31
3	METHODOLOGY.....	31
3.1	INTRODUCTION.....	31
3.2	PROJECT PURPOSE.....	31
3.3	PROJECT APPROACH.....	32
3.4	PROJECT STRATEGY.....	32
3.4.1	DESIGN AND DEVELOPMENT OF M-FLOWERS.....	33
3.4.1.1	JAVA 2 SOFTWARE DEVELOPMENT KIT.....	33
3.4.1.2	WIRELESS TOOLKIT BETA 2.5 (WTK25).....	34
3.4.2	SOFTWARE ARCHITECTURE.....	35
3.4.2.1	JAVA 2 MICRO EDITION (J2ME).....	36
3.4.2.1.1	Coding.....	36
3.4.2.1.2	WHYJ2ME?.....	37
3.4.2.1.3	DOES J2ME FULFILL THE REQUIREMENTS FOR M-FLOWERS?.....	38
3.4.2.1.3.1	Ease of use of MIDlets.....	38
3.4.2.1.3.2	J2ME and Technical Feasibility.....	39
3.5	DESIGN OF THE APPLICATION.....	39
3.5.1	DEVELOPING MIDP APPLICATION.....	40
3.5.1.1	Adding an Emulator.....	40
3.5.1.2	Creating new project.....	42
3.5.1.3	Creating MIDlet Suites.....	44
3.5.1.4	Adding a MIDlet to a MIDlet suite.....	47
3.5.2	User Interface (UI) Design.....	47
3.5.2.1	Editing the MIDlets.....	48
3.5.2.2	Compiling and Executing MIDlet Suites.....	51
3.6	LIMITATION OF THE PROJECT.....	54
CHAPTER 4	.....	55
4	RESULTS AND DISCUSSION.....	55
4.1	INTRODUCTION.....	55
4.2	PERFORMANCE TESTING.....	55
4.3	TEST RESULTS.....	56
4.4	DISCUSSION OF TEST RESULTS.....	61
4.4.1	Software architecture.....	61
4.4.2	Implementation Prototype.....	62
4.4.2.1	Obstacles in Implementation.....	62
4.4.2.1.1	File Extension of Images.....	63
4.4.2.1.2	Images cannot be displayed.....	63
4.4.2.1.3	Simplicity.....	64
4.4.2.1.4	Using of a database.....	64
4.4.2.1.5	Non-availability of real J2ME devices.....	65
CHAPTER 5	.....	66
5	CONCLUSION AND FURTHER DEVELOPMENT.....	66
5.1	INTRODUCTION.....	66
5.2	CONCLUSION.....	66
5.3	FUTURE DEVELOPMENT (RQ3 Section 1.4).....	67
BIBLIOGRAPHY	.....	69