

TESIS^ APPROVAL STATUS FORM

JUDUL: INTELLIGENT MOBILE SYSTEM FOR E-MEDICINE

SESI PENGAJIAN: 2004/2005

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INTELLIGENT MOBILE SYSTEM FOR E-MEDICINE (IMOSEM)

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Intelligent mobile system for e-medicine (IMOSEM) /
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This report is submitted in partial fulfillment of the requirements for the
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**FACULTY OF TECHNOLOGY AND COMMUNICATION TECHNOLOGY
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ADMISSION

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DEDICATION

I am as ever, especially indebted to my parent, Cheong Yoon Soon and Lim Tee for their love and support throughout my life...

ACKNOWLEDGEMENTS

Projek Sarjana Muda (PSM) is compulsory for a KUTKM student before being awarded the degree. The primary purpose of this PSM is to provide guidance and chance to students to develop a complete and individual project whereby students will encounter many new problems and challenges.

My thanks due to many people, whose experiences and knowledge I have drawn on over many months, on the subject on PSM. Much inspiration was given to me by Assoc. Prof. Goh Ong Sing who encouraged me to take up the challenge. Going into research at a new concept or big idea required a special type of courage. On hindsight, it was the right decision after all. Instead of doing those common system developments, spending the time to build up a new concept system seems more meaningful.

Besides, I would like to express gratitude to all of the lecturers in KUTKM that gives their cooperation throughout accomplishment of the project by providing me with the required needs. Without their cooperation, I would not be able to go through the phase smoothly.

Last but not least, I would like to express my heartfelt thanks to my parents, who give me the fully support to accomplish this project. Moreover, I wish to appreciate all my friends who encouraged and supported me along this project.

Thank you for all your kind help and advice.

ABSTRAK

Intelligent Mobile System for eMedicine (IMOSEM) ialah satu sistem canggih yang dapat menjawab soalan yang ditanyakan oleh pengguna. Skop bagi soalan adalah di dalam bidang perubatan sahaja. IMOSEM ialah robot pintar yang dikenali sebagai doktor maya atau IMOSEM Bot. Dengan adanya enjin IMOSEM, IMOSEM Bot dapat menjawab soalan yang tidak ada di dalam lingkungan pengetahuan.

Enjin *Crawler* akan membantu IMOSEM Bot untuk mencari pengetahuan yang diinginkan daripada laman jaringan jika IMOSEM Bot tidak dapat menjawab soalan yang dikemukakan oleh pengguna. Dengan adanya antaramuka yang serupa manusia, diharap pengguna boleh berbual atau bertanya sebarang soalan yang berkenaan dengan perubatan dalam suasana yang selesa dan semulajadi. Selain itu, enjin *Crawler* berupaya untuk mendapatkan berita terkini secara automatik daripada laman jaringan tertentu. Berita akan dikemaskinikan dalam 30 minit jika laman jaringan tersebut mengemaskinikan maklumat. Satu lagi fungsi yang canggih bagi IMOSEM ialah pengguna boleh menggunakan perkhidmatan IMOSEM melalui perkakasan *mobile* seperti *PDA* dan telefon bimbit. Perkhidmatan SMS dibekalkan untuk memudahkan pengguna untuk menikmati perkhidmatan di mana-mana jua atau bila-bila masa jua. Pengurus pelayan IMOSEM mempunyai hak untuk menyelaraskan konfigurasi IMOSEM secara langsung seperti menyatakan URL bagi penggunaan enjin berita perubatan dan enjin *Crawler*.

Model Air Terjun dipilih sebagai metodologi bagi projek ini dan akan digunakan sepanjang proses pembangunan sistem ini supaya dapat memenuhi objektif projek. Akhirnya, ini merupakan satu peluang yang baik untuk merealisasikan satu konsep yang baru atau idea yang besar. Jika projek *R&D* dapat diteruskan, ia tentu akan membawa revolusi kepada laman jaringan pada suatu hari nanti.

ABSTRACT

The Intelligent Mobile System for eMedicine (IMOSEM) is an intelligent system which able to answer the question asking by user. The scope of question is restricting in medicine field only. IMOSEM is intelligent robot also called as virtual doctor or IMOSEM Bot. With the ability of engine behind IMOSEM, IMOSEM Bot now can answer the question which out of scope of knowledge base.

IMOSEM Crawler engine will help IMOSEM Bot to search for the desired knowledge from World Wide Web if IMOSEM Bot unable to answer user's question. With human-like interface, IMOSEM, hopefully user can chat or inquiry any kind of questions related to medical in a user-friendly manner and good interactive environment. Besides that, Crawler engine is able to grab the medicine news automatically from specified partner websites. The news will be updating in 30 minutes if those partner sites have updated. Another powerful feature of IMOSEM is, user can access IMOSEM service through the mobile device either PDA or mobile phone. SMS service is provided to ease the public to access from anywhere or anytime. Administrator of IMOSEM server has authority to configure the setting of IMOSEM directly include specify the URL path for medicine news and Crawler.

Waterfall Model has been chosen as a methodology for this project and will be implemented along the system development process to ensure the objectives of the project can be fulfilled. Finally, this is a precious opportunity to turn a new concept or big idea into reality. If this R&D project is keeping on, it should bring a new revolution to internet in the future days.

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Figure 7.1: Overview of test plan

LIST OF ACRONYMS

ACRONYMS	DESCRIPTION
	[A]
AIML	Artificial Intelligent Markup Language
ALICE	Artificial Linguistic Internet Computer Entity
AUT	Application Under Testing
	[D]
DBMS	Database Management System
DSN	Data Source Name
	[E]
ERD	Entity Relationship Diagram
	[G]
GPRS	General Packet Radio Service
GUI	Graphical User Interface
	[H]
HCI	Human-Computer Interaction
HTML	Hyper Text Markup Language
HTTP	Hypertext Transfer Protocol
	[I]
IE	Internet Explorer
IMOSEM	Intelligent Mobile System for eMedicine
	[K]
KUTKM	Kolej Universiti Teknikal Kebangsaan Malaysia
	[M]
MMS	Multimedia Message Service
MSN	Microsoft Network
	[O]
ODBC	Open Database Connectivity
OOP	Object-Oriented Concept
	[P]

PDA		Personal Digital Assistant
PHP		Hypertext Preprocessor
POS		Part Of Speech
	[R]	
R&D		Research & Development
	[S]	
SDLC		System Development Life Cycle
SMS		Short Message Service
SQL		Structured Query Language
	[T]	
TTS		Text To Speech
	[U]	
UML		Unified Modeling Language
URL		Uniform Resource Locator
	[W]	
WBS		Work Breakdown Structure
	[X]	
XML		Extended Markup Language

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Crawler Module, Wrapper Module, DataConversion
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CHAPTER I

INTRODUCTION

1.1 Overview

Despite the growth in information and communication technology, computerized application is required to have some basic intelligence. Artificial Intelligence (AI) has gained its place in the information technology (IT) world nowadays and requires for a perfect humanized computing environment, which is now in this research. Undoubtedly here, humanized computer application is the trend of current IT world. In the other side, mobile industry is changing very radically. Never a week goes by without some serious new technological development or idea announcement. Reasons for this vary, but the major one is that the mobile devices such as mobile phone and PDA provide a virtual production area for mass communication, archives, work, information processing, data transfer and so on so forth which is not dependent on time, location, or phone platform.

Is that those technologies can make use of and help people in their daily life? Where is the point if we do not catch the advantages which come along with new technology?

To gain those available advantages and make use of them, hence the idea is finally become reality with a solution - **Intelligent Mobile System For e-Medicine** which integrated the technology such as ALICE Knowledge base, World Wide Web and mobile phone. This is a highly sophisticated service to let the people to gain the knowledge from any possibility of inquiry about medicine through applicable

medium. In another the word, it is a virtual doctor that can help people to settle down the medicine problem in sense of theory.

Intelligent Mobile System for e-Medicine is equipped with a web robot so as it can reducing user reliance on live agent to provide better answers and information to service inquiries in medicine field. In addition this Intelligent Mobile System incorporates personalization techniques by using technologies such as profile recognition, user configuration, click stream analysis, human touch interface, crawler, inference engine, live interaction, multilingual knowledge base support, segmentation or rules based personalization and collaborative filtering. Constructed web robot is able exploits natural human social tendencies to convey internationality through motor actions and facial expressions. In this system, one of the most important processes in the formation and maintenance of a relationship is that of self-disclosure. It is the act of revealing private and personal information to others. Bearing the results of this research in mind, Intelligent Mobile System for e-Medicine is incorporates with web robot. By the way, this system is accessible from various mobile technology services include SMS, GPRS and PDA.

1.2 Problem Statement

The motivation of this project is providing a high performance system which can provides a unified and easily accessible source of knowledge. Since the size of the World Wide Web grows rapidly, the ability for people to surf the web and locate a specific page is increased. Nonetheless, the effort to get the wanted information is not as accurate as what we expecting. As the solution, a united knowledge base is needed to gather and centralize all the related information. Knowledge base system is able to grab the suitable knowledge from related web sites and present found knowledge to user.

Researches were done on a few websites to gather the resources and analysis related to project. Here are two of among organizations and websites which are project research target; **A. L. I. C. E. Artificial Intelligence Foundation**

(<http://www.alicebot.org>) and **eMedicine Clinic Knowledge Base**

(<http://www.emedicine.com>)

Conclusion of research shows that there are no existing service provides the similar powerful features as what this project does. There are a few awkward and inconvenient parts in current available systems that make the service not so worthy at all. Firstly, the construction of knowledge base is based on manual work which is tedious and costly. Secondly, the content of knowledge base is limited. Thirdly, information of medicine is delivered to user in pure html-form where user needs to spend time to browse from page to page until the answer is found. Fourthly, system can be reached only in Web-based system.

1.3 Objective

There are many potential business and public that would benefit from the use of Intelligent Mobile System For e-Medicine. But this project focuses only on five of them, which consider as the most important.

Section [1] shows that any kind of medicine knowledge can be found from one-stop knowledge base service. Section [2] indicates the evolution of Intelligent Mobile System For e-Medicine towards medicine inquiry. Section [3] supports the idea of getting information from anytime and anywhere. Section [4] shows that the initiative of system to collect more information to enrich the knowledge base. Section [5] mentions to improve the effectiveness of current interactive between human and robot.

1) Provide One-Stop Medicine Knowledge

Develop a portal with latest information for public awareness to tackle new disease such as SARS and bird flu. Any inquiry for medicine can be done straightly through the system without going too far on information finding within internet. This will offer user a new alternative information disseminator in the Internet, which can be

perceived as more trusted and credible. Rumors, hoaxes, false and bias information which will affect informational uncertainty not to be consider in this development.

- 2) **Revolution of Traditional Medicine Inquiry**
Provide unlimited communication between the users and web robot. This dimension constitutes the globalization of the medium. And most important thing is, it is a free medicine inquiry which acting as medicine assistance.
- 3) **Smart and Easy Way To Get Latest Information**
Introduce latest technology such as SMS to provide more convenient interactive information to the user of the system. System is accessible from PDA through the Wi-Fi service too. As long as the mobile device has SMS-enabled services, people can look up for the information anytime and anywhere. It's like having the medicine dictionary with you everywhere you go.
- 4) **Automation of Information Grabbing**
Grab the information from World Wide Web spontaneously to increase the rich of knowledge base. The information can be retrieve and collect from specified web sites without tedious and costly manual work to join up separate information. As the result, backend system can work independently by its intelligences.
- 5) **Interactive Between Human and Robot**
Enhance the effective of communication between human and non-human by deploying Artificial Intelligent Neural-network Identity (ALICE) which integrated with human-like avatar (doctor/nurse) 3D character, speech technology (Text-to-Speech) and web robot. In another word, the users can interact and communicate naturally with web robot by any applicable medium.

1.4 Scope

This project concentrates on the design of engine behind the system which uses to grab the desired knowledge from specified websites. By the way, developer needs to investigate the new rules that the restrictions and possibilities of the internet and mobile environment imposes on users. This means that experiences from current mobile services, as well as experimental systems implementing in web technology and information access, are of interest.

Basically this Intelligence portal is running in a space so called as 3-tier environment. In 3-tier systems, its operating environments are classified into Front-End (User Interface), Back-End (Server Side) and Database (AIML knowledge base) show in the Figure 1.1 below.

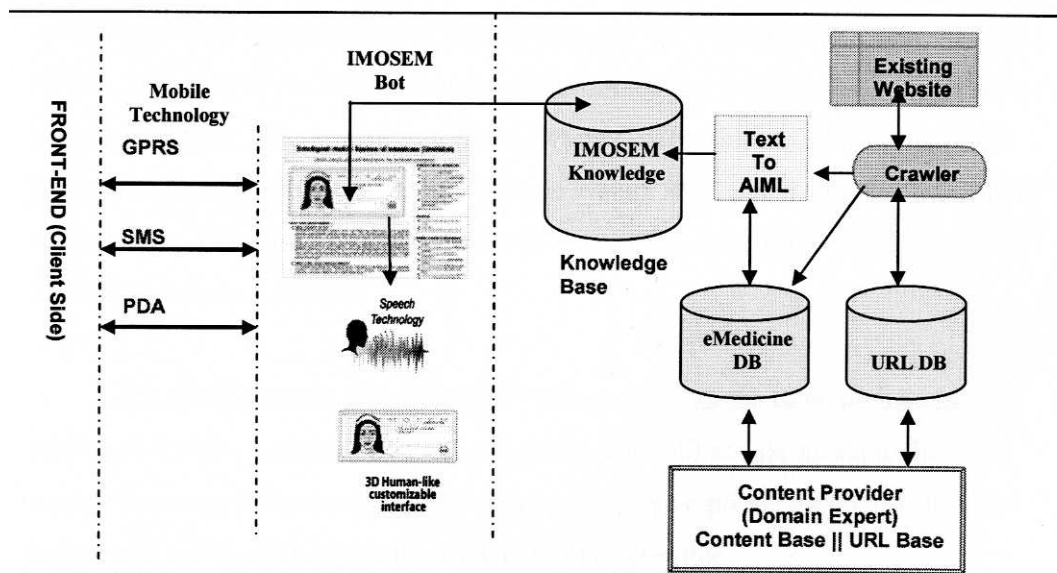


Figure 1.1: Front-end and Back-end architecture