Mobile Staff Instant Interaction System

by

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Dissertation submitted in partial fulfillment of

the requirements for the

Bachelor of Technology (Hons)

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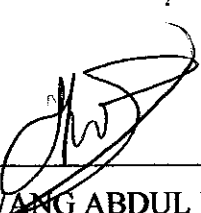
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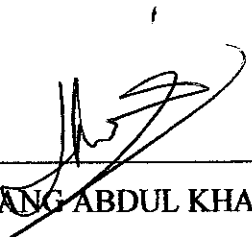
AWANG ABDUL KHAIRULANNUAR

CERTIFICATION OF APPROVAL

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A project dissertation submitted to the
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Approved by,

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ABSTRACT

The purpose of this report to give a detail a view about the final year project that has been developed by author which is "Mobile Staff Instant Interaction System" which is intended for lecturers and student using Local Area Network(LAN) wireless connectivity. The report contents background of study, problem statement, objective and scope of study, literature review and theory, methodology, and conclusion and recommendation. Basically, the problem of the current situation is when a frequent consultations and appointments have to be done for learning or project purposes. Alternatively, the LAN-Based system will replace the current systems that are such as Yahoo Messenger and email which require an access of internet when the connection is off. The scope of the project is to keep the interaction between both entities constantly be held. A user could set an appointment to the intended target users form the registered user and consult remotely using the appointment. The methodology been used is waterfall model because the author is dealing with a proposed and new knowledge to the author. This will need a further studies and investigation on the wireless architecture itself, WAP system development and implementation. As for conclusions, the author has described about the recommendation and important of the system in term of efficiency and time which are crucial that could accelerate a certain task progress.

ACKNOWLEDGEMENT

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CHAPTER 1

INTRODUCTION

Overview

In the current communication trends, the usages of mobile services have increased rapidly. The most common application is mobile phones for voice transmission, but systems for data transmission between mobile units and information server for example to Internet is also applicable an is keep on growing. To make this media efficient and interesting it is also important that the transmission rate isn't too low and the hand unit is easy to use.

1.1 Background of Study

Wi-Fi is shorthand for the term Wireless Fidelity which is a Wireless Local Area Network (WLAN) specified as 802.11b by the IEEE which was originally intended for wireless devices, and Local Area Networks or LAN's and has a maximum speed of 11Mbps.But now, it is popularly used to access the Internet. It facilitates a person or a network in an office environment with a wireless-enabled computer or a PDA to connect to the Internet when in proximity of an access point, generally called a 'Hotspot'. Wi-Fi basically operates through signals that can be captured through antennas from these hotspots. There are various types of antennas for various uses.

The main difference between cellular and Wi-Fi is that, while the cellular system use licensed spectrum, Wi-Fi is implemented in unlicensed bands. The economic basis for their implementation is therefore completely different. However the success of Wi-Fi

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has made many people look to this unlicensed spectrum as the future of wireless access, rather than the licensed and controlled by large corporations.

PDA or Personal Digital Assistant with wireless fidelity or Wi-Fi is now ruling the digital market for a very many number of reasons. Primarily it does not hold the user connected to a stationary telephone line and allows the person to roam about provided he or she is within the network of course.

Such a PDA needless to say is extremely helpful. It can store contact information, take notes, take down memos, keep track of schedules, remind the user of commitments and carry out calculations as well. Such PDA's with Wi-Fi can also send and receive e-mail, do word processing, play MP3 music and MPEG movie files. They can also download information from the Internet, play video games and also incorporate such sophisticated items like digital cameras.

1.2 Problem Statement

As for today, the author found that WAP application such as "Mobile Staff Instant Interaction System" is important. It is because, from the author's experience of the Final Year Project Part 1, there are some lecturers who are busy with their works and additionally discussing with student under their provision. The idea came from the author's experience in preparing an intranet application during the industrial internship training where the author need to place a module where the staffs and students could view the availability of a lecturer or support staff which is by the time implemented using a notice board. With the available network structure, it is easier for the users to know the availability of the certain staff and set up for an appointment as long as the users are within the network.

Furthermore, there applications available on internet support instant messaging such as Yahoo Messenger and MSN Messenger. With the enhancement to the wireless network, any user with a wireless enable device could extend their connectivity and flexibility within the wireless network coverage.

1.3 Objectives

The objective of the project is as the addition to the available system which are e-learning systems and instant messaging application. However, the project is focusing more on the interaction among lecturers or staffs and students using wireless Local Area Connection. The system will ease the direct communication between the two entities with low setup and deployment cost. Using the Wi-Fi technology will enable a user with the Wi-Fi enable device to interact with the system as long as they are within the roam about the hotspots.

The main advantage of the system is where a lecturer could set their availability status that could be referred by the other users for any appointment and consultation or sending instant message. Alternatively, the availability of the computer lab for student access will no longer be problem.

1.4 Scope of Study

The research and study will be focusing on the architecture, interoperability, instant messaging WAP application.

1.4.1 Architecture

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To understand the system architecture of WiFi and WAP application, it is necessary for me to know how it works. This is basically how it functions:

- A transmitting antenna is linked to a DSL or high-speed land-based Internet connection to uses radio waves for beaming signals.
- Then another antenna, which is in the laptop, PC or mobile devices, catches the signal.
- This signal has a range of about 300 feet for most home connections. The farther the user is from the signal, the slower the connection speed would be.

1.4.2 Interoperability

When designing a mobile application, it is important to consider the different wireless options, and never forget the fact that no mobile technology, not even a cell phone, is ubiquitous and reliable. Even when connected, a link's reliability and bandwidth can change instantly, so the hardware and software need to be able gracefully to accommodate disconnects and reconnects, with minimal impact to the quality of the user experience.

1.4.3 Instant Messaging

There are several instant messaging applications available such as Yahoo Messenger, AOL messenger, Skye, Microsoft's IM and other. The use of the applications is to send an instant message or text message to other users instantly. From this, I have decided to develop an Instant Messaging Application which is designed for WAP users. A different contact of an instant messaging using WAP is slightly different from the currently used application as stated above in term of type of application. The focus of this project is to develop a WAP based application that enables instant messaging and appointment setting.

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CHAPTER 2

LITERATURE REVIEW

Overview

This chapter reviews all studies, theories and research facts done by credible professionals in their respective fields which are published in world wide journals. The authors use the facts as the basis of this project. All studies, theories and research discussed are based on the identified sources.

2.1 Wi-Fi Networ

There are two ways of Wireless LAN accesses which are Peer to Peer or Ad Hoc Peer to Peer and using Access Point [4]. A mobile station would select on the type of connection to establish create or join the available network.
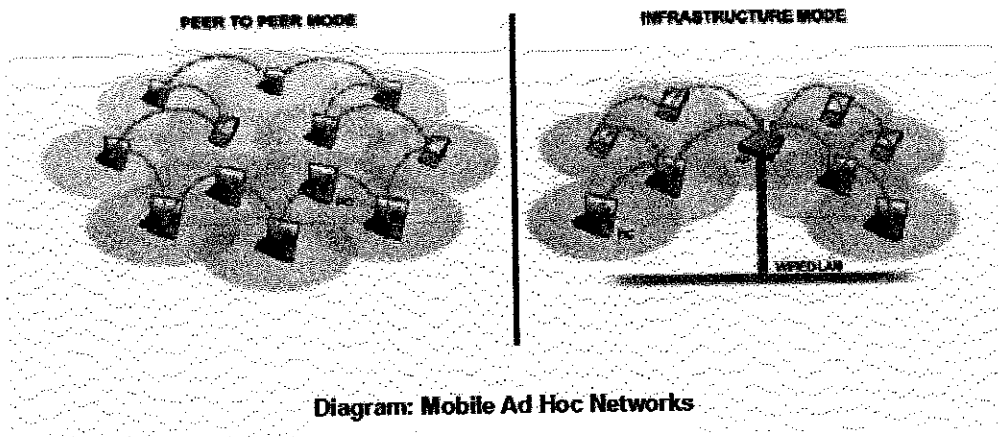
Figure 2.1: Wireless Network Diagram

An Ad Hoc network or Peer to Peer network will connect a Mobile Station or several Mobile Stations directly without any intermediary devices instead of placing an wireless routers to create a LAN. The weakness of the Ad Hoc network is that the limitation of the number of the connected Mobile Station.

2.2 Factor in Developing Wi-Fi System

The wireless approach shows many advantages but also has some disadvantages with respect to cabled networks. Mobility is clearly one of the major advantages of wireless with respect to cabled devices, which require plugging [5]. Another advantage lies in the way new wireless users can dynamically join or leave the network, move among different environments, create ad hoc networks for a limited time, and then leave. Wireless networks are simple to deploy, and in some cases cost less than wired LANs. Nevertheless, the technological challenges involved in wireless networks are not trivial, leading to disadvantages with respect to cabled networks, such as lower reliability due to interference, higher power consumption, data security threats due to the inherent broadcast properties of the radio medium, worries about user safety due to continued exposition to radio frequency, and lower data rates.

There are four areas that a developer should consider in developing a Wi-Fi Application [6]:

2.2.1 Roaming Between Hot Spots

a. Employees need to be productive with corporate information anywhere, anytime, even when beyond the range of a Wi-Fi hot spot. It's important to design a system for always-available access that combines local data storage of

information on the device with the ability to synchronize when back inside wireless coverage or by other means from remote sites.

b. Even while in range of a corporate, public or home Wi-Fi access point, mobile workers may find it necessary to work in disconnected mode in order to preserve scarce battery power or save on airtime costs. Using an always-available application architecture that will work in disconnected mode is important consideration, so the mobile workers can keep working in the office, on the road or at home.

2.2.2 Ease of Use

a. A user may be non-technical and using this technology for the first time. The application needs to be easy to use and tailored for users' needs. For example, features such as one-button synchronization or graphical pull-down menus minimize typing and improve the user experience. If the technology gets in the way of users doing their jobs, the application will be quickly abandoned in favor of pen-and-paper methods.

b. A developer also should match hardware considerations carefully with the needs of the application, evaluating the appropriate drop factor, battery life, memory requirements or special features like bar-code scanning. For example, a field worker completing inspections won't need the same device as a sales representative on the road. Having a device well suited to the users' needs, and the we will improve productivity with a lower total cost of ownership; buy an inappropriate device, and constant repairs, user frustration and a poor return on investment could be the result.

c. Implementing a system that enables users to connect to corporate resources in a variety of ways, including Wi-Fi, wide-area wireless or wireline options. For example, salespeople, inspectors, service personnel and other mobile users need the flexibility to smoothly and securely move among a variety of connection methods in order to synchronize data. Mobile users can also stay in touch and on top of important meetings, calls and deadlines anywhere, anytime.

2.2.3 Ease of Administration

a. Given limited on-site IT resources, choose software and database technology that runs seamlessly on the mobile device. The goal should be to choose technology that will remain invisible to the worker and run without user intervention or troubleshooting.

b. For overall IT administration, a developer can simplify deployment and support and reduce costs by adopting a centralized management strategy. Leverage automated central software distribution to save our users the time and complication of having to download their own files.

2.2.4 Security

a. Wireless LANs and local hot spots can be accessed by unwelcome users unless proper security measures are taken. It's important to remember that application files may contain confidential business information and must be protected whether it's located on a PC in the office or a handheld device in the field.

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b. Incorporate local data encryption and authentication to protect information even if the device is lost.

2.3 WAP Application

The name "Wireless Application Protocol" (WAP) is misleading. WAP is not actually a protocol at all, in the sense that HTTP and IP are protocols. In fact, WAP involves multiple protocols and complete network architecture for delivery of wireless content. According to the WAP Forum, the goals of WAP are to be [7]:

- Independent of wireless network standard.
- Open to all.
- Proposed to the appropriate standards bodies.
- Scalable across transport options.
- Scalable across device types.
- Extensible over time to new networks and transports.

WAP defines a communications protocol as well as an application environment. In essence, it is a standardized technology for cross-platform, distributed computing. It sounds similar to the World Wide Web and of course it is. WAP is very similar to the combination of HTML and HTTP except that it adds in one very important feature: optimization for low-bandwidth, low-memory, and low-display capability environments. These types of environments include PDAs, wireless phones, pagers, and virtually any other communications device.

Both WAP and Web content distribution concept concentrate on distributing content to remote devices using inexpensive, standardized client software. Both rely on back-end

servers to handle user authentication, database queries, and intensive processing which use markup languages for delivering content to the client. In fact, as WAP continues to grow in support and popularity, it is highly likely that WAP application development make use of their existing Web infrastructure in the form of application servers, for data storage and retrieval.
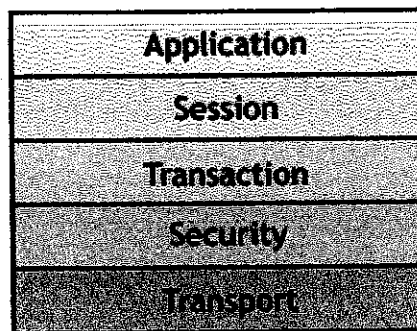
Figure 2.2: WAP Model

WAP model, or stack as it is commonly known, is illustrated above. It consists of application layer, session layer, transaction layer, security layer and transport layer. Detailing this project, the author is just dealing within the application and session layer.

2.3.1 WAP Application Layer

WAP application layer is the Wireless Application Environment (WAE). WAE directly support WAP application development with wireless markup language (WML) instead of HTML and JavaScript. WAE also includes the Wireless Telephony Application Interface (WTAI or WTA for short) that provide a programming interface to telephone for initiating calls, sending text message and other networking capabilities.

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2.3.2 Session Layer

WAP's session layer is the Wireless Session Protocol (WSP). WSP is the equivalent to HTTP for WAP browsers. WAP involves browsers and servers just like the Web, but HTTP was not a practical choice for WAP because of its relative inefficiency on the wire. WSP conserves precious bandwidth on wireless links; in particular, WSP works with relatively compact binary data where HTTP works mainly with text data.

2.4 WAP Application Architecture

A WAP gateway is a service enabler that is normally located in the service layer, between Internet and mobile networks. The service layer consists of many other service enablers for Mobile Internet such as charging systems and mobile positioning systems. WAP protocol runs like a tunnel from the WAP mobile via radio waves towards the connectivity layer, the control layer and finally the service layer [8].

A WAP gateway in the service layer is operated by the mobile network operator. Other WAP gateways on the public Internet can be used as gateways for web servers or by application developers for testing purposes. For intranet and Enterprise WAP applications, the WAP gateway can be located in an intranet to be used as a proxy for the both Enterprise WAP applications and WAP pages located on the public Internet.

The following figure shows a simplified overview of how a WAP request goes from a WAP phone, through a mobile infrastructure with WAP gateway, and how it terminates on a WAP application on the Internet. The picture also shows some examples of WAP application that can use other types of services from the service layer for support.
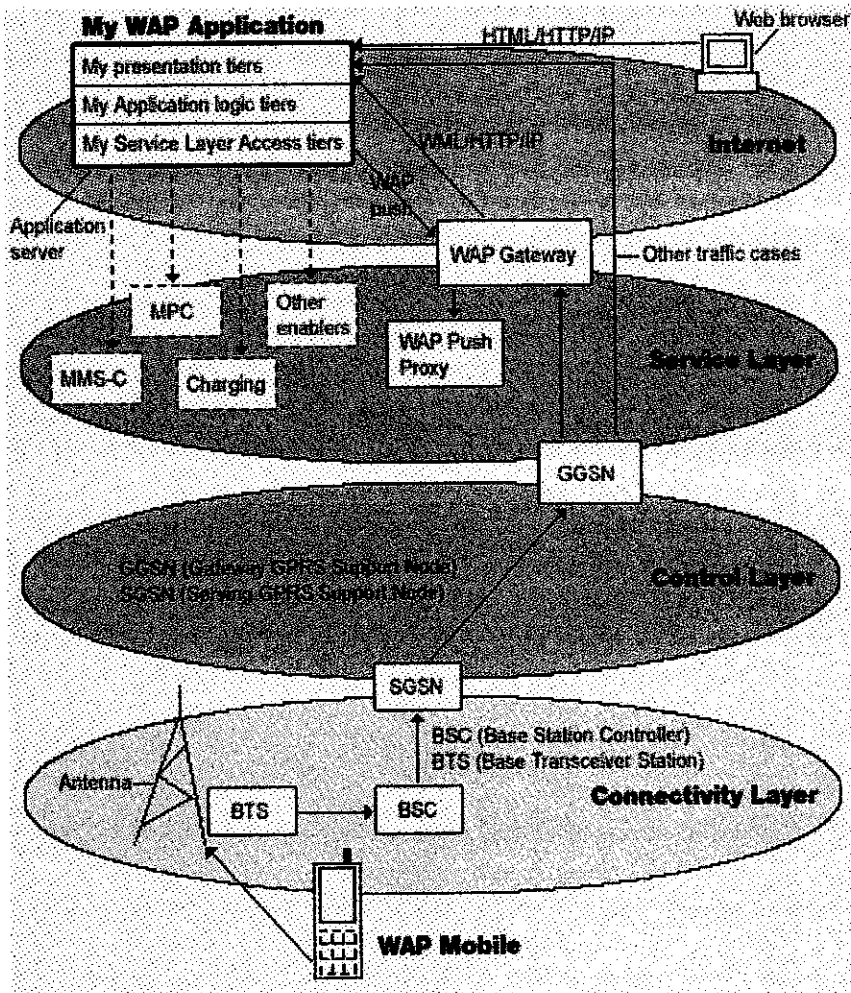
Figure 2.3: WAP Application Architecture

2.5 Development Tools

The author has chosen several development tools in developing the system. There are available in internet used for free such as Apache Web Server, PHP4, WAP Proof (Mobile Emulator), Dreamweaver MX 2004, WML Script and WinMySQLadmin Version 1.4 for Win95/Win98/NT/Win2000.

2.5.1 Wireless Markup Language

Wireless Markup Language (WML) 1.x is the markup language defined in the WAP 1.x specification. WAP is the standard created by the WAP Forum (which now the Open Mobile Alliance [OMA]) that brings the World Wide Web to wireless devices [9]. It specifies the protocol stack and application environment of mobile Internet browsing applications. The role of WML in mobile Internet applications is the same as that of HTML in web applications. WAP sites are written in WML, while web sites are written in HTML. WML 1.x is very similar to HTML. Both of them use tags and are written in plain text format. Some tags in WML 1.x are directly borrowed from HTML. If you have experience in using the HTML markup language, you should be able to learn WML 1.x quickly.

Some features of WML 1.x are specific to wireless devices. For example, WML 1.x provides a way for developers to program the softkeys of mobile phones. This feature is not supported in HTML since computers do not have any softkey. WML files have the extension ".wml". The MIME type of WML is "text/vnd.wap.wml".

2.5.2 Hypertext Preprocessor (PHP)

PHP is a widely-used general-purpose server-side scripting language that is especially suited for Web and WAP application development and can be embedded into HTML, XHTML and WML [10].

PHP can be used on all major operating systems, including Linux, many Unix variants (including HP-UX, Solaris and OpenBSD), Microsoft Windows, Mac OS X, RISC OS, and probably others. PHP has also support for most of the web servers today. This includes Apache, Microsoft Internet Information Server, Personal Web Server,

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Netscape and iPlanet servers, Oreilly Website Pro server, Caudium, Xitami, OmniHTTPd, and many others. For the majority of the servers PHP has a module, for the others supporting the CGI standard, PHP can work as a CGI processor. So with PHP, you have the freedom of choosing an operating system and a web server.

2.5.3 Apache HTTP Server

Although PHP enhanced WML application can be develop and serve on any web server, the Apache web server will be featured in this project. The Apache HTTP Server Project is an effort to develop and maintain an open-source HTTP server for modern operating systems including UNIX and Windows NT. The goal of this project is to provide a secure, efficient and extensible server that provides HTTP services. Apache has been the most popular web server on the Internet since April of 1996. The February 2005 Netcraft Web Server Survey found that more than 68% of the web sites on the Internet are using Apache, thus making it more widely used than all other web servers combined [11].

2.5.4 MySQLAdmin

MySQLAdmin is a client for performing administrative operations. It can be used to check the server's configuration and current status, to create and drop databases, and more. Meanwhile, all information and data can be stored and retrieve from a database that enhances the functionality of an application. Not only is MySQL the world's most popular open source database, it's also become the database of choice for a new generation of applications built on the LAMP stack (Linux, Apache, MySQL, PHP /

Perl / Python.) MySQL runs on more than 20 platforms including Linux, Windows, OS/X, HP-UX, AIX, Netware, giving the kind of flexibility control.

2.6 Conclusion

The details written above stated the technical view of the implementation of a WAP application. It serves mobile user similarly as the common web application available on internet. The differences arise as the limited physical features of a certain mobile itself. Options of development tools freely available on internet and online forum have assist much on the development progress.

CHAPTER 3

METHODOLOGY AND PROJECT WORK

Overview

Every system design adheres to a specific adheres to a specific software process. In developing the "Mobile Staff Instant Interaction System" the Waterfall Process Model has been chosen. The model consists of preliminary investigation, design, implementation, and testing stage which are depicted in figure 3.1.
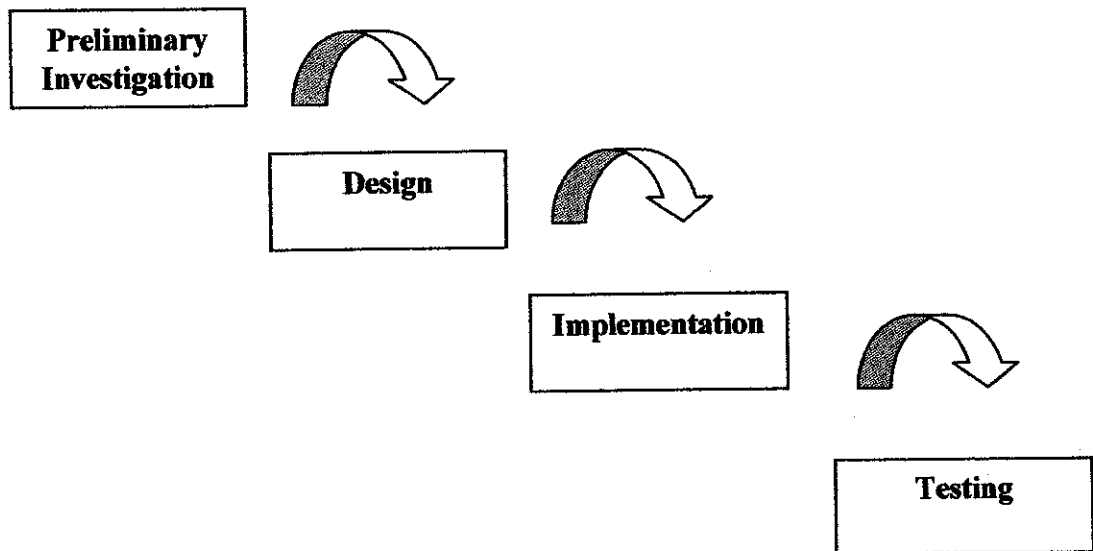

Figure 3.1: Waterfall Development Model

3.1 Preliminary Investigation

This is the stage of identifying problem and studies on current issues arise. The activities included in this stage would be identifying the problem statement. A research was done regarding on the current system of developing an Instant Messaging for a wireless LAN. The author needs to identify the problems statement in order to prepare the direction of the project.

As been mentioned in the first paragraph of this section, in the earlier phase of this project the author have focus on the fundamental of this project and the principal of this project in order to bring this project to the proper direction. Considering the project background for this project, the problem background that lead to the initiation of this project, and the project objectives and the scope of study has to be done in first. These are elements that need to be clarified and need for data gathering for a better development of this project.

For this stage, the author has primarily use internet as the main source in the data collection process such as journal, online discussion boards and reference books. In the same time, the author has using the opportunity to collect information regarding the wireless technology from colleagues, articles and supervisor.

In the other hand, the planning category requires identification of tasks and procedures that are necessary to complete the system. The tasks and procedures are apart of scope definition that defines the scale of the project. A Gantt chart (Please refer to the appendices) is produced as part of the scheduling plan to ensure it the feasibility of the project within the given time frame and within the scope of the project as well.

3.2 Design

In this stage, the author designs the basic architecture of a mobile system. As for designing the architecture, the author analyzes the currently available techniques to implement the system best. Analyzing examples of architecture included in journals and research papers gives a big impact in the designing stage.

The design stage is purposely to transform the requirements statement into design specifications for system development. The designing category also addresses how technology will be used in the project. As for the purpose of this project several elements need to be design in order to have a good view of this system before the development phase take part. The resulting elements of this stage would be system architecture and system design itself. These design requirements are a representation of system flow in terms of entities, attributes, relationships and rules.

3.2.1 System Architecture

The framework of the Instant Mobile Staff Interaction is depicted as in *figure* x. It consists of a content server, database, WAP gateway, and access point and a mobile device.

The content server would serve the actual interface that will be displayed to a mobile user. An interaction and exchange of data would incur the retrieval of data stored in a database. The WAP gateway provides wireless networks with internet access and optional content translation and filtering. It is an intermediary between the Internet and the mobile network. It converts our WAP request into a Web request when we send information from a mobile device to the Internet. On the flip side, a WAP Gateway also converts a Web to a WAP request when sending information from the Internet back to a mobile device.
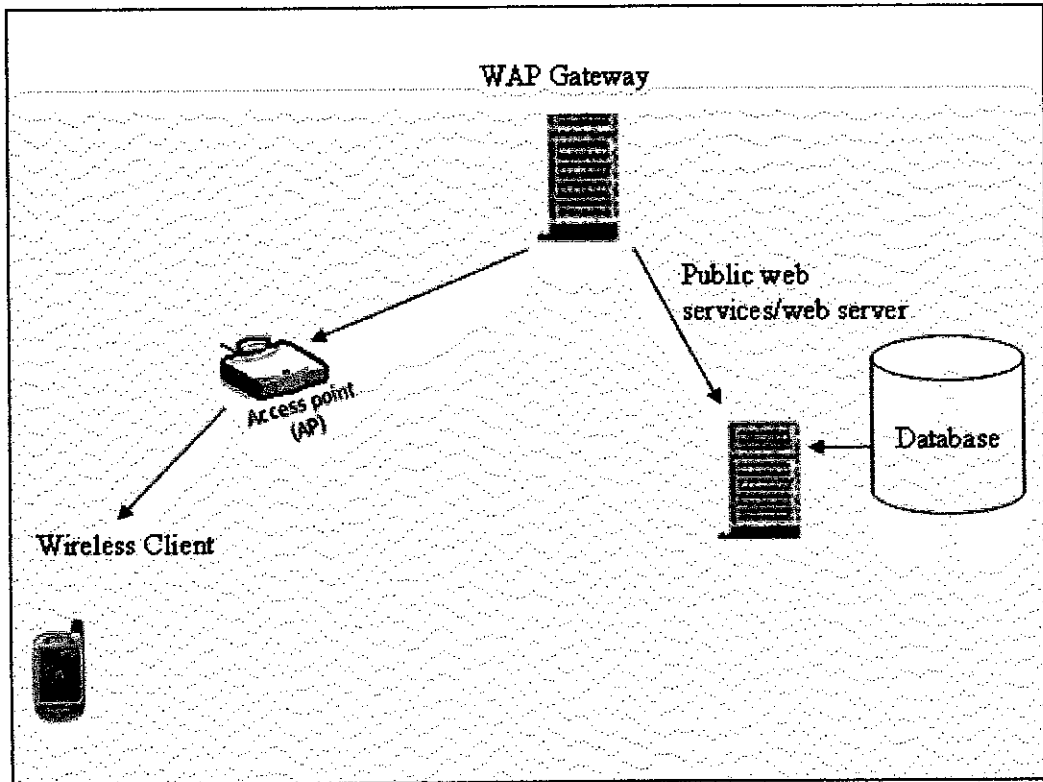
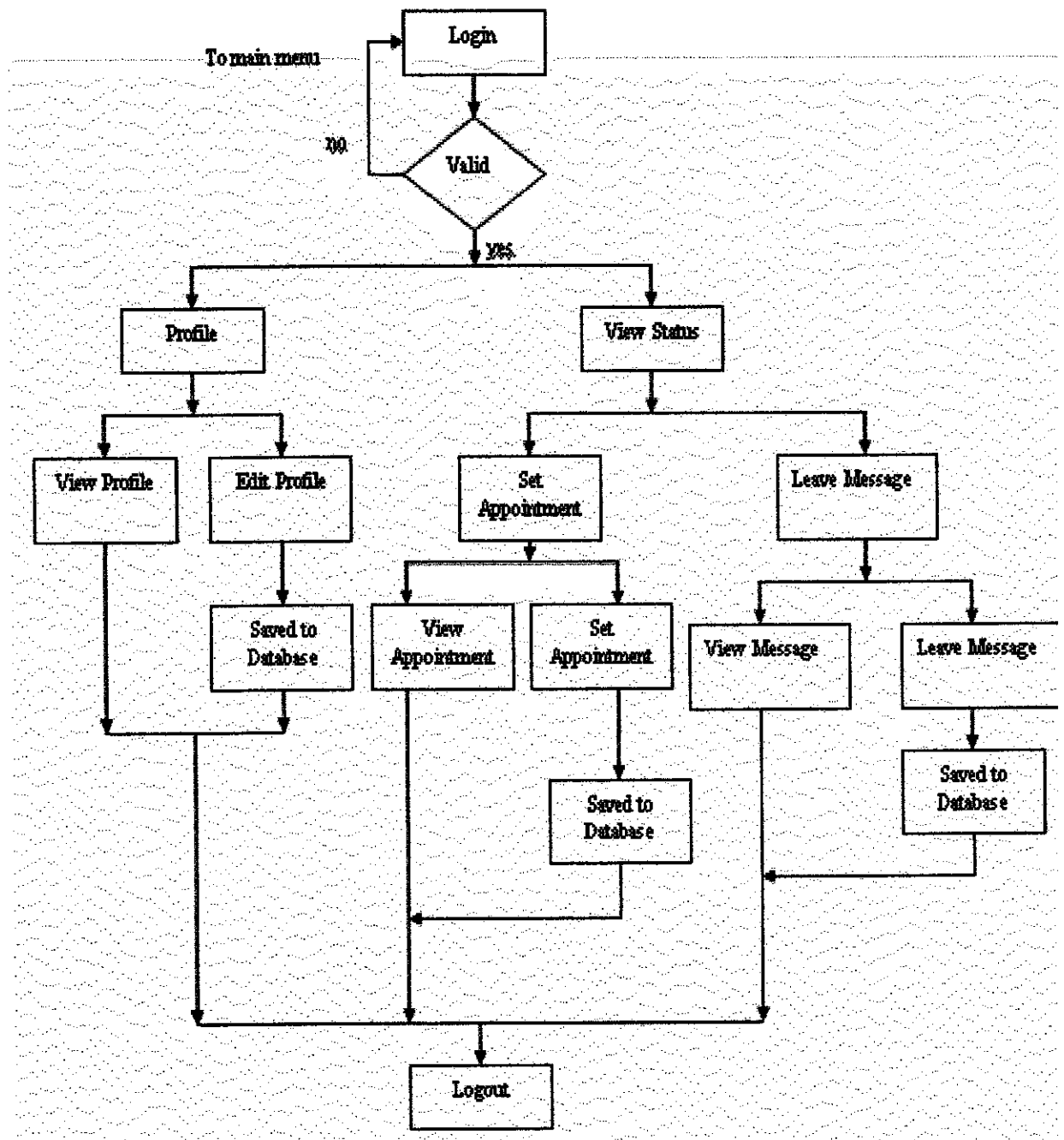Figure 3.2: Mobile System Architecture

3.2.2 System Flow Diagram

Figure 3.3: Mobile Staff Instant Interaction System Flow Diagram

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Figure 3.3 shows the flows of the Mobile Staff Instant Interaction Diagram diagrammatically. The details are illustrated as the following:

i.   A client/user will navigate to the welcome page of the system which then directing user to verify their account. Each user has to create an account to enable the accessibility to the functions or modules provided from the system.

ii. Once logged in, the user will be directed to the main page that displays the available modules. The modules are personal profile, user list personal message and setting up an appointment.

iii. Navigating through the personal profile enables the user to edit or modify their personal details that has been created earlier.

iv. User list would provide user with the current user who have been added to their respective user account. It also allows user to search for new user to be added in the list and delete in list user as well.

v.   Message module is however enables the user to send a personal message to any users listed in their user list. The module serves the function of composing, sending and deleting message.

vi. Under the appointment module, the user can set up an appointment to certain user prior to a meeting or discussion. The user also ca view their appointment schedule and edit or delete the schedule as well.

3.2.3 Database Design

Table 3.1: userAccount – Information related to a registered user.

userAccount	
ID (PK)	integer
username	String
password	String
name	Integer
year	integer
program	String
status	integer

Table 3.2 : friendList – List of friends of a user.

friendList	
ID (PK)	integer
userId	integer
friendId	Integer

Table 3.3: message – Data related to message.

message	
ID (PK)	integer
receiver	integer
sender	integer
date	string
subject	string
detail	string
status	integer

Table 3.4: Appointment – Data related to appointment

appointment	
ID (PK)	integer
owner	integer
sender	integer
date	string
subject	string
detail	string
status	integer

The above tables are used by the author to store related information of the system. The database named "*appointment*". It used to store all information regarding appointment setting. Each table has an identical name used for modules or functions included in the system.

3.3 System Development and Implementation

The development information is the stage that to translate all the designed elements into a system. With the designed specifications, system development phase is a stage where the modules can be constructed. Translation of information into a system is assist by the development tools available on internet such as WAP emulator, MySQLAdmin, and Apache content server. Among the tasks to be implemented includes the databases, web application programs, and user interface. In addition of development, the using of additional tools such as SQLYog assists the manipulation of database and management.

3.3.1 Development tools

Basically there are two main categories of tools that are applied for this project development process, which are software and hardware. There are necessary to simulate a real working environment of a running production system. However, some items are not available due to resource constraints, thus they are replaced by either emulated devices and assumed to work the same in real world.

3.3.1.1 Hardware

Hardware is representing the important development machine that enables developer to develop and view the result at the same time. By the time of the development stage, the developer has set up his personal computer as the content server, database, mini browser or emulator and development tools as well. Developing and managing information regarding the project in a specific machine facilitate and accelerate the process itself instead fulfilling the system requirements virtually.

3.3.1.2 Software

Microsoft Windows XP Professional Edition has been chosen as the platform of the project as it offers more stability and reliability over other Windows platforms.

WinSQLadmin Ver 1.4 for Win95/Win98/NT/Win2000 is used in as the storage element because a freeware and compatible with various platforms and available on internet for download. Installing an Apache HTTP Server 2.0.50 allows developers to deploy the content inside the server and serve it back for retrieval in browser. Contents consist of files that interface user navigation through the system. In the same time, the author has to use the WAP Proof instead of an actual mobile device that could display the real world working system display. The choice of WAP Proof is because of it availability on internet and reliability of browsing. There are some other mini browser's emulators available but the WAP Proof fits the author's preference.

Development tools that the author has used are listed as follow:

- Microsoft Windows XP Professional Edition
- Macromedia Dreamweaver MX2004
- Apache HTTP Server 2.0.50
- WinMySQLadmin Ver 1.4 for Win95/Win98/NT/Win2000
- SQLYog
- Adobe Photoshop CS
- Microsoft Internet Explorer 6.0
- WAP Prof (Mobile browser: emulator)

3.4 Testing

Although the author has been choosing the waterfall development style, integrating the testing process in the development and development stage is quite important in order to identify the bugs incur during coding. Several data also used to test the reliability and integrity of the system.

3.4.1 - Try and Error

In doing the testing, the author has implementing method such as a try and error. It is very helpful to the author. It allows the author to test, detect and correct errors while developing the system. Besides that, the method also enables the author to maintain the developing style and keep track on events related to the modules in which the author is developing.

3.4.2 – Prototype Based

In the other hand, the author also applies prototype based development cycle within the testing stage. It is because the will continue to make detect and correct unnecessary function included in the system which is required by the system requirement. This process takes place when the author has completed a module and revises for any improvement.

CHAPTER 4

RESULT AND DISCUSSION

4.1 Overview

As has been mentioned earlier, the objectives of the project are to develop a mobile application that is used to facilitate staff interaction and utilize the availability of the LAN structure in an organization. Developing the Mobile Staff Instant Interaction system also manipulates the availability and functionality of the current trend of using mobile device. In the same time, the mobility of the device itself allows the user to access the system as long there are roaming within the wireless area.

4.1.1 Welcome Page

A user who is navigating through the system will initially navigated to a welcome page for a time interval; for this system the time is 20 seconds. It will then automatically navigate the user to the login page for authentication purpose.
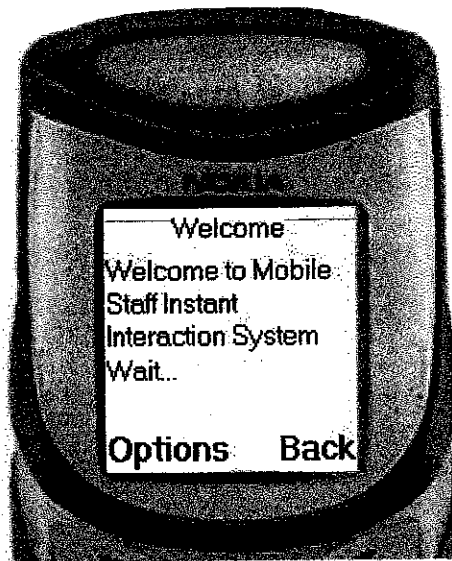
Figure 4.1: Welcome Page

4.1.2 Login Page for Mobile Staff Instant Interaction System

Each time a user navigates to the system, they will be prompted to verify their account through login page. The verification process validates the entered information with the information stored in database. Besides that, the module also allows a new user to create an account in order to access the other system's functionality.
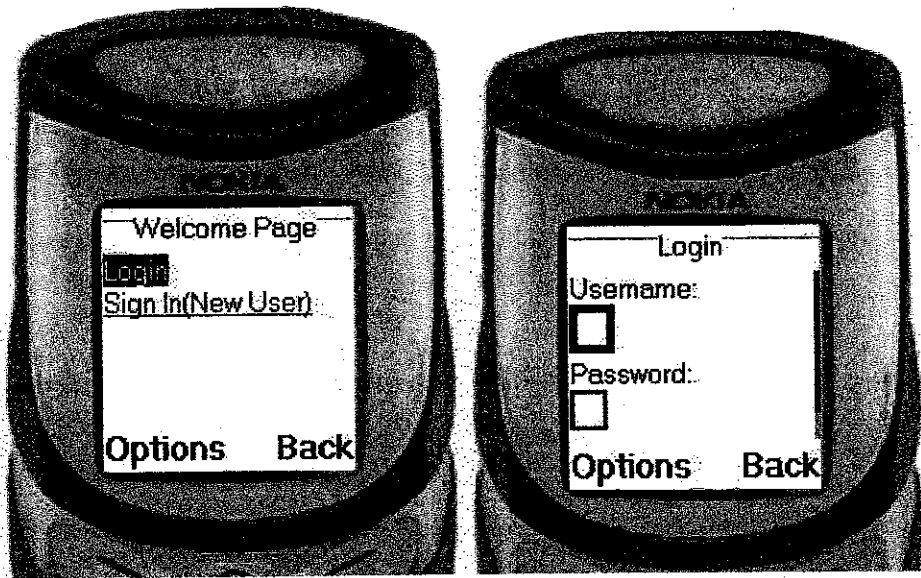
Figure 4.2: Login Page

4.1.3 Main Page for Mobile Staff Instant Interaction System

Once verified, the user will then automatically be navigated to main page which displays links to all available modules in the system. The links are profile editing, user list, inbox message and appointment.
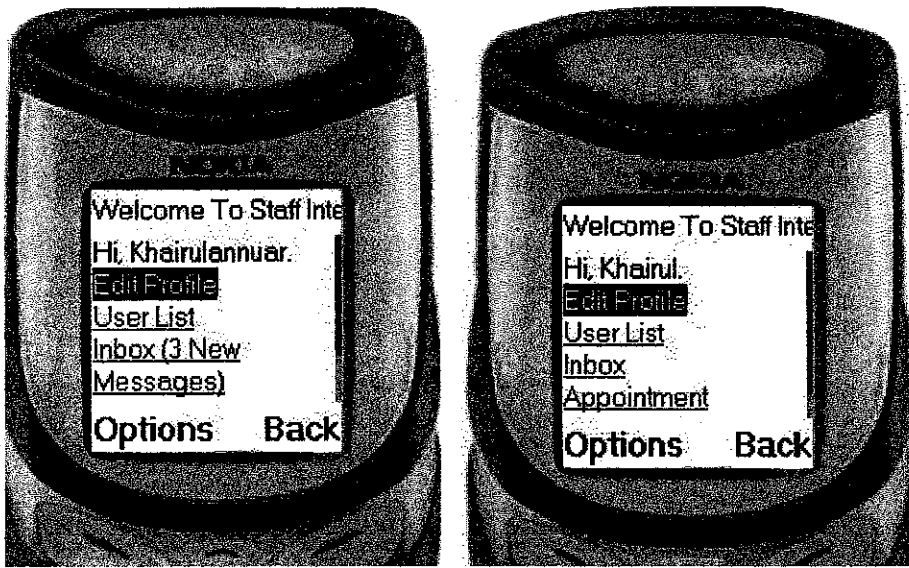
Figure 4.3: Main Page

4.1.4 User List for Mobile Staff Instant Interaction System

Using the user list link stated in previously, it will then navigate a list of user related to the current user. If the list is empty or intend to add new user into the list, the user can use the user sub module which is search user module. Onne a username found, the user is prompted either to add the searched user to the list or ignore the search.
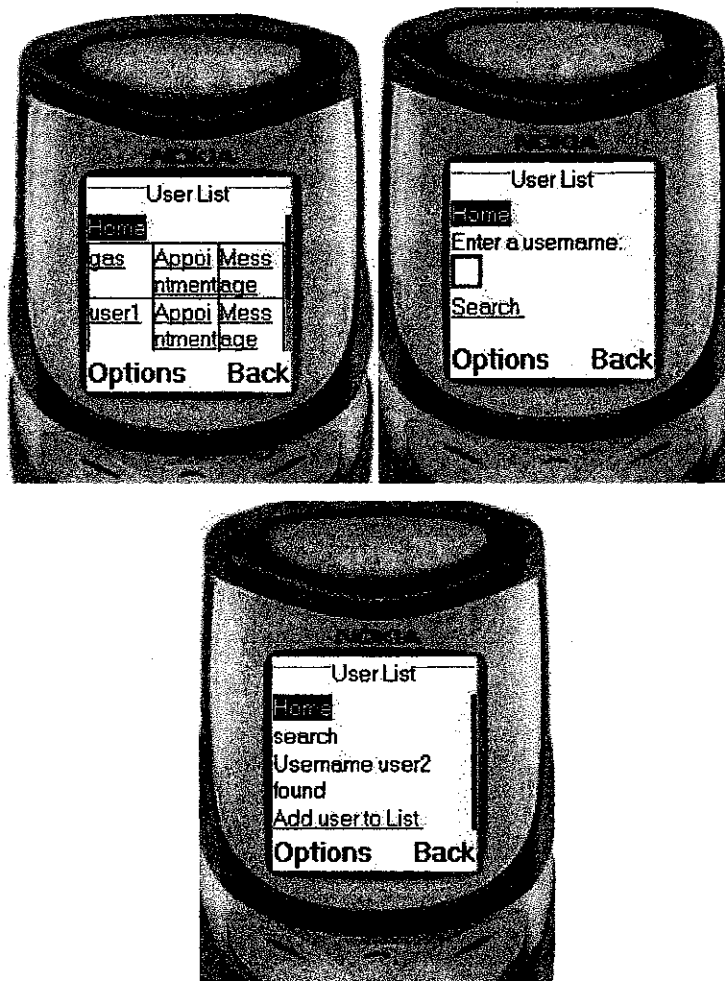
Figure 4.4: User List and Search User Page

4.1.5 Personal Message for Mobile Staff Instant Interaction System

A personal Message module is one of the main modules provided in the system. Form figure 4.3, the third link; inbox link indicates the user has 3 new unread messages. Using the link, the user will be navigated to the inbox list that display message titles and senders. The personal message module also allows the user to select user from user list to send a message.
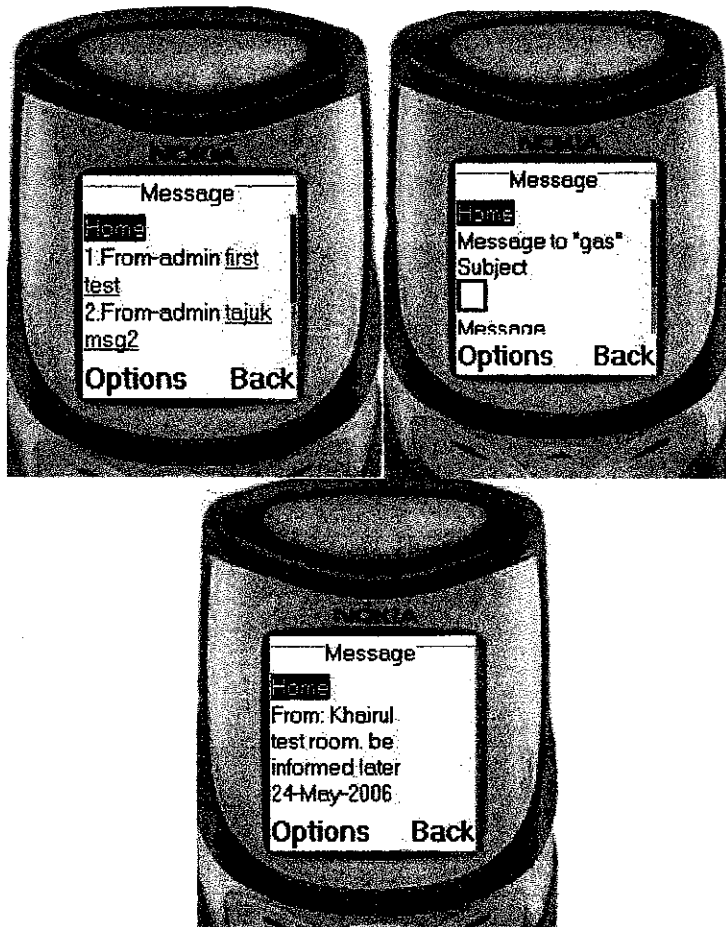
32

Figure 4.5: Personal Message Page

4.1.6 Appointment Module

The last module provided is appointment module. This function is mainly targeted for interaction between staffs. It allows user to set up an appointment with staff. The module is actually similar with the personal message module; however, the idea is to isolate appointment matter with the others. The appointment module is able a user to set view the target user's availability schedule as to make an appointment.

In the other side, the appointment module enables a user to view his or her appointment list for a particular day. A reminder will be received by the user if there is any appointment as the user first enters the system for a particular day.
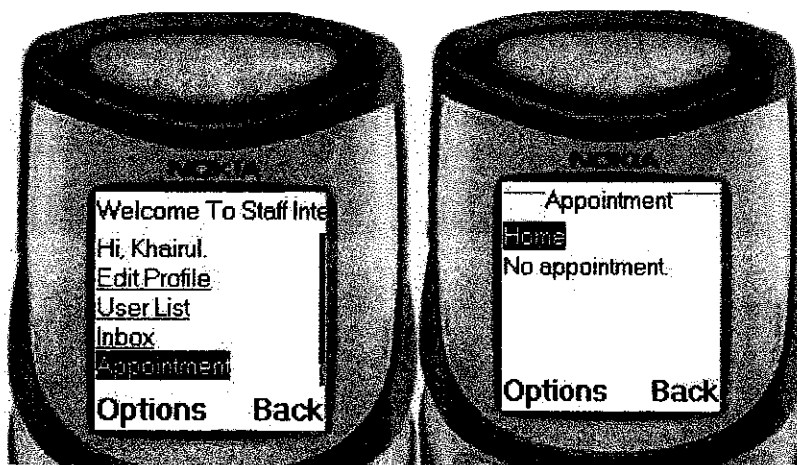

Figure 4.6: Appointment Page

4.2 Discussion

As the development stage in progress, there are certain challenges and constraints occur or involve. There are also several things that needed detailed discussion for clarification. Below is the discussion of the challenges and constraints with solution that can solve them.

4.2.1 WAP Application

The decision of developing the system is to enable mobile user to utilize and maximize the used of LAN connectivity in an organization. It is applied using publicly wireless

connection area in a LAN instead a license band as provided by telecommunication service provider.

4.2.2 User List

The user list module is actually listing the related users to the current user. The user have to add a user in their respective user list in order to enable the used of personal message and appointment module. Before adding a new user, the current user has to know the intended username to be added. The module will then search for the targeted user for confirmation. Once found, the system will be prompted the current user to confirm the addition of user into the current list.

4.2.3 Wireless Bitmap (BMP)

Due to the consideration of limited bandwidth that is available in WLAN 802.11b network which only offer max throughput of 11 MBPS at best effort, it is decided that WBMP is one and only image type to be included in the system. Furthermore, the wireless network is not necessary able to perform well at all the time and most likely will achieve only between 7 MBPS to 8 MBPS that has to be shared between all the mobile device. Apart from that, the small screen size of mobile device will limit the viewable size of images and displayed information at one time in one page.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

A wireless application or specifically WAP application makes it possibly to communicate with the mobile user and to exchange information. This project details the relevant studies, background, constraints and currently used system.

Mobile Staff Instant Interaction System will basically assist interaction among staffs and student as well. The functionality of the system is mainly to facilitate the appointment setting with lecturers. There is no available system that offers such function which utilizes the LAN structure in the organization. With the addition of wireless characteristic and the system in the available structure, student can improve the progress of communication and discussion with lecturer even when the internet connectivity and availability of both party is absent.

Development and implementation stage involve a little experience on using Apache HTTP Server, PHP and HTML is needed. So far, the Apache HTTP server, MySQL 4, and PHP3 or PHP4 is running well on a windows machine. Developing a WAP based application requires the use of mobile device emulator instead of the real working mobile device, WAP Proof. Any WAP phone that compliant with WAP 1.1 is possible to view the contents of the WAP application.

In this project, several critical issues are investigated for wireless technology. Throughout the process, it has been proven that design factor plays a big role in achieving the objectives and scope of the system. With the reference of the existing

WEB based system adaptation of modules has given a broad view of implementing the new featured mobile system.

5.2 Recommendation

Up to the current stage project development, the suggested next task is to further develop the system prototype for operational testing using real hardware devices rather than using emulator. The purpose of operational testing is to verify the usability and functionality of the system in a real world environment. Due to the constraints of getting the necessary hardware devices such as Wireless Access Point router and mobile device with Wi-Fi capability, it is recommended to perform an operational testing to specifically verify the conformance of the system performance against the network requirements.

A part from that, the system development should proceed in order to measure the effectiveness of this system and to see how it can really improve the interaction between students and lecturers. In order to have the accurate result the complete system that can be implemented in the real business environment should be observed by the system provider on any weakness of the system. The feedback from the business operation manager is also very important. The assessments from users are very important for the system provider in order to increase the usability of the system and enhance the user friendliness of the system as well.

A part from that, the author has several recommendations that need to taken into consideration by the system provider.

5.2.1 Complete Personal Profile

In order to increase the system functionality, the system provider could expand the user profile module by allowing a user to create an account with a complete personal profile and contact. This could assist in communication by the time the network service is down. Information such as email, telephone number and address can be added to the personal information and contact.

5.2.2 User Daily Schedule

Although the current system enable a user to set an appointment to the other user, it is relevant a user daily schedule module to be added. It is because; the module can be used as a personal organizer of the user. Integrating the personal schedule with appointment module will enable the target user show they available slot for any appointment or consultation by the current user.

5.2.3 Request Confirmation

Request confirmation is specifically recommended is the user list module. Although a user could any target user registered in the system, the features of request for confirmation should play a role. Meanwhile, when searching a particular username is succeed; the current system status should be pending request while the target user approves the request for addition in their user list. This feature could avoid anonymous user in user list.

5.2.4 – Po-up Reminder for Incoming Appointment

As a user enter the system, a pop-up reminder can effectively remind the user with his or her daily events. This functionality could trigger action from user and reduce the possibility to miss a certain function or event.

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APPENDIX: