

# **Internal Parcel Management System (IPMS)**

by

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the requirements for the  
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**CERTIFICATION OF APPROVAL**

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Approved by,

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June 2006

## CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgments, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.



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NORBAYA AIDA BINTI NORDIN

## **ABSTRACT**

The project is about integrating the SMS function with a website based system. The idea for the project started by identifying the problems that always faced by students in University Technology of PETRONAS when receiving parcels. Usually the parcels will be sent straight to UTP by the courier service provider like Pos Laju, DHL, FedEx and etc. the parcels then will be kept in the main office where every parcel information will be recorded. Parcels for students will be sent to Lembaran Residential Office for them to be collected by the recipients. The problem comes up when students need to check the list of recipient's names on the board in front of Lembaran Residential Office. The objective of this project is to provide an integrated system for admin and general users which are staffs and students. It makes the work of checking on their parcels arrival easier and faster. Furthermore, it will eliminate the need to re-type the parcels information, first in the main office and second in Lembaran Residential Office. One more major function is to include the SMS functionality in order to alert the recipients. It enable user to receive the news on their parcel arrival on time. The methodology used is waterfall model. The system has been developed based on the six step of system development life cycle those are planning, analysis, design, develop, integration and test, and lastly operation and maintenance. If one stage fails then it will be go back to previous stage. The end of the project it hope that the objective will be achieved whereas the system can view the record of general user online from their PC, while admin may use admin privileges on the information and also may use the SMS functionality.

## **ACKNOWLEDGEMENT**

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# **CHAPTER 1**

## **1 INTRODUCTION**

This chapter comprises the basic information of the project, which includes the background of the project, problem statement, the objectives and the scope of the study. This project will basically touch on how to combine two different technologies which are website application and Short Message Service (SMS) technology into one powerful system.

### **1.1 Background**

Short Message Services or also known by their acronym SMS is a very popular technology in the wireless world. About 20 billion SMS messages are sent worldwide every month. Started as a communication tool between people, its usage has been widening into many other application. With the emerging of internet and information technology era, SMS usage has emerge together with them. SMS has become a key service for mobile operators, generating tremendous usage, particularly among the youth market segment. Nowadays it has been used in marketing to advertise, bill payment, booking hotel or flight ticket, monitoring device, reminder application, entertainment industries where you may get news of your favorite's artist or horoscope, and lately as the voting tool. With the advent of technologies such as WAP and the introduction of GPRS and 3G, some question the future of SMS. It is clear, however, that SMS will have a long life as a low-bandwidth messaging service, available on all types of phones.

Short Message Service (SMS) is actually a mobile data service that allows alphanumeric messaging between mobile phones and other equipment such as voice mail systems and email. SMS is a store-and-forward system. Messages are sent to a Short Message Service Center (SMSC) from various devices such as another mobile phone or via email. The SMSC interacts with the mobile network to determine the

availability of a user and the user's location to receive a short message. One of the issues with SMS is interoperability between different technologies and application. The current technologies had showed that SMS no longer can be send and receive from mobile to mobile but also from web based system or any other few applications. This project is to study the effective ways to integrate SMS capabilities with applications using personal computer as platform. The capabilities of SMS technology working with web application via web programming language like eXtensible Markup Language (XML), PHP, and Wireless Markup Language is an interesting topic to do research on.

In order for two different technologies to work together it must has a medium to interact. The medium in this case is the SMS Gateway. As SMS Gateway is responsible for managing all SMS headers and communications with the GSM Modem/Handset, this header information needs to be stripped away so that just the actual message content remains. Additionally, SMS Gateway supports a powerful bi-directional HTTP based eXtensible Markup Language (XML) and PHP interface.

Basically, this project concentrates on a new system for UTP's parcel handling system to build a web based application, accessible by anyone and anytime and also to send out small notification messages to students and teachers, via SMS if they got parcel.

## **1.2 Problem Statement**

### **1.2.1 Problem Identification**

Among the difficulties faced in the current parcel management system is that it is not very effective because the information regarding the parcel arrival is hardly reaching the recipient. Usually, the info on the recipients name will be posted on the board which situated at the Lembaran Residential office. Problems arise when students have to go by themselves by walking or by vehicle to the Lembaran office to check on their parcel either it is arrived or not. If let's say the parcel still didn't arrive he/she has to come back day later to check again.

For the student who has no vehicle they need to walk and this is just a waste of energy and time. For the one who has car or motorcycle they may easily go and back from the office but still it a waste of fuel and money. The situation will be worse when the recipient has no knowledge that he/she had receive a parcel. There will no one to inform them that they got a parcel. Later on the parcel will be abandoned and according to the worker handling the parcels, they only got three days to take the parcel before it will be sent back to the sender. At last, the parcel did not arrive to the intended receiver.

This has been a big problem issue. For the recipient of the parcel, they may have important other things to do and have no time to check on parcel they got. Sometimes, it is important for the parcel to reach the receiver as soon as they can because the contents of the parcel maybe vulnerable, sensitive or important. There is no other way for students and staffs to reach the information. The other problems occur when student take their parcel, the info on the parcel had been taken will, not updated to database as the current system is using built in database. So the main office will not know the updated status of parcel acceptance by the recipients. The parcel might be lost somewhere and it cannot be traced down.

### **1.2.2 Significant of the project**

Basically, this project and the development of the application would be bringing some importance, which are listed as follows:

- First and foremost, the entire project aimed at demonstrating the abilities of SMS as a medium of real time notification. It also focusing on the abilities to integrate with web based system which will be handling the data recorded. This project could be contributed to the development of future application in order to use the most suitable technology for the right application being developed.
- This project will be regarded as significant by looking at the project objectives in combining two different technologies to provide a useful system.

### **1.3 Objectives**

This research has few objectives to be achieved so that there will be a guidelines and goal to aim while doing the project. These as the objectives of this project:

- To improve process of handling parcels.
  - To make use of SMS technology to minimize the problem.
  - Notify recipient at real-time about their parcel.
  - Recipient may trace their parcel at anytime and anywhere.
  - To provide real-time data record system.
- To integrate website application with SMS technology.
  - Web-based application to record data and send SMS used by post staff.

### **1.4 Scope of study**

Looking at the scope of the entire project, it would basically focus on how to incorporate SMS technology with web based application. The project will be on the process of connecting between these two technologies. The main concept of this project is to enable a web based system to send text message (SMS) to the intended receiver. A web based application will be develop as the medium where users may have access to latest news and information relating to parcel delivery via tracking feature and also SMS feature to inform them at real-time. A web system will be develop in order to enable postal staffs to record data on parcels which then will be updated and can be accessed by general user straight away. This project is considered as able to be completed throughout the given semester. It is based on the application used to develop the system such as Macromedia Dreamweaver, Apache, MySQL, PHP, and HTML. In completing this project the SMS Gateway also will be needed. SMS Gateway providers are available to purchase on the net.

## CHAPTER 2

### 2 LITERATURE REVIEW AND THEORY

This chapter features the previous study on SMS technology used with other applications for different purposes. It provides the background information on the method, tools, and software used. This chapter also contains related finding on this field, consisting of relevant theories, facts and data, which are relevant to the objectives and findings of the project.

#### 2.1 Positioning

SMS are being sent and received from the cell phones via the SMSC of the GSM carriers. For the SMS to reach their destination when triggered by software or a web interface SMS Gateway software will be used. In the case study related, they have been using OpenSMS Gateway Software.

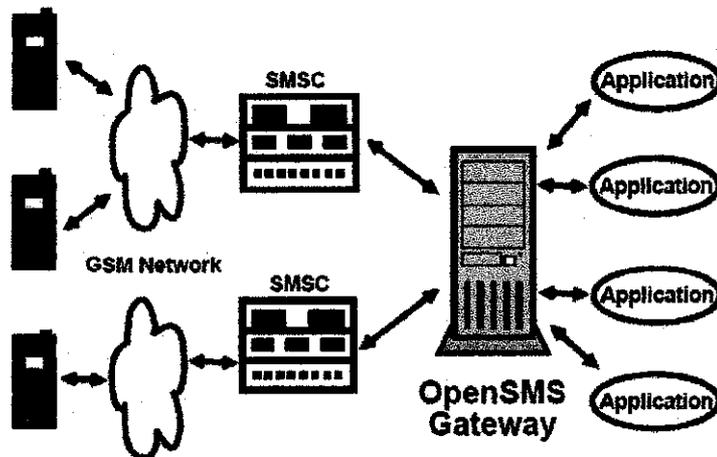


Figure 1.1

OpenSMS handles the communication between the application and the SMSC: SMS generated by applications are sent to the cell phones by OpenSMS via the SMSCs and cell phone generated SMS are collected by the SMSCs and forwarded to the application by OpenSMS.

## **2.2 Interface to applications**

### **2.2.1 HTTP Interface**

SMS can be sent by a HTTP request (GET or POST).

Example: HTTP request

Sending of an SMS originating from the number \123" to the GSM Destination 0049171999999 and the content \hello world" via HTTP/GET

```
http://sms.openit.de/cgi-bin/sms-put?  
orig=123&dest=0049171999999&data=hello+world
```

Such a request can be accomplished by a few lines of code in a Web application.

### **2.2.2 E-Mail Interface**

The sending of an SMS can also be triggered by an incoming E-Mail, which uses the same parameters and offers the same functionality.

Example: Sending via E-Mail

Sending of an SMS originating from \123" to the destination number 0049171999999 and the content \hello world" via the E-Mail Interface:

From: application

To: mail2sms@sms.OpenIT.de

orig = 123

dest = 0049171999999

data = hello world

An SMS received from the network can also be converted into an E-Mail and be forwarded to the application to be processed.

## **2.3 The Database**

Several databases are used to manage and archive the SMS, they are also used for accounting and billing.

### **2.3.1 Outgoing SMS database table**

All SMS generated by the HTTP and E-Mail interfaces are stored in this database table. It keeps information about the time of the request, the actual time of sending, the carrier to be used and the state of the SMS (eg. \new", \processed" or \error"). The sending \smsd" process fetches the SMS from this table and updates the state of the SMS to \processed" when the SMS has been sent successfully. If an error occurs during the sending, (eg. an invalid destination address) the state of the SMS is set to \error". A clear-text error message is generated and inserted into the outgoing SMS table. Users can log into the Web interface and check the state of their SMS, search for a single SMS or view statistical information. An extended Web interface is available for administrators

## **2.4 Sending processes "smsd"**

The sending software consists of so-called Unix system daemons. They make up the interface of the OpenSMS gateway to the SMSCs of the GSM network or other output channels, for example GSM modems. Every sending daemon process takes care of sending SMS over one specific output channel. Therefore a fault condition of one SMSC does not interfere with the sending of SMS to other carriers. A configuration file enables the administrator to determine which SMS are to be processed by this daemon process, to specify if any SMS should be received, what protocol the SMSC uses and by which protocol the SMSC can be reached via the physical link.

### **2.4.1 SMSC connections**

The physical links to the SMSCs typically have a bandwidth about one to several hundred SMS per second. The reception of SMS under a central short number is possible, if the carrier supports this feature.

The following protocols are provided to communicate with SMSCs:

- ERMES UCP (Universal Computer Protocol) incl. Large Account related extensions
- SMPP (Short Message Peer to Peer Protocol)
- OIS - SMS2000 Open Interface Specification

The following protocols are provided to address SMSCs over physical links:

- TCP/IP over Internet, Leased Lines, DialIn
- X.25
- X.31
- TCP/IP over X.25
- Frame Relay

All reasonable combinations of the above are possible.

#### **2.4.2 GSM Modems**

GSM modems offer another possibility to send or receive SMS. Although they have some disadvantages (e.g. bandwidth limitations), they often provide a useful addition because of their special functionality. GSM modems have a bandwidth of about 6 SMS per minute and they provide a low-cost possibility to connect to carriers when smaller amounts of SMS are expected. By installing several GSM modems in parallel, the possible throughput can be increased. The ability to receive SMS under a network wide, universally reachable telephone number is a particular advantage of GSM modems. This number can be reserved for a customer and/or an application to collect all the affiliated SMS. The receiving capacity is about 50 SMS per minute and per GSM modem.

## 2.5 Home Network Security

In addition SMS application also has been using in the monitoring system. Among the popular one is to remotely monitor and control the devices in the HNS via laptop computer or a GSM mobile terminal. In addition to responding to remote queries, the managed devices (e.g., home appliances or burglar alarm system) can actively send alerting messages to a mobile terminal when an abnormal state occurs. Through the HNS gateway, the monitoring and control information is diffused to the Internet/GSM network.

That is, the HNS gateway can actively use WAP push , HTTP push mechanisms or SMS to send messages to a mobile station or laptop computer. For example, in the home appliance subsystem, an appliance can actively send an alerting message to the HNS gateway (by posting information) when detecting an abnormal situation or a warning signal. The HNS gateway receives this alerting message and then pushes it to the home user in SMS (see Fig.1.2). Similarly, in the security subsystem, an alerting message can be sent when a burglar alarm rings or a surveillance system detects intruders. In the messaging subsystem, the HNS gateway notifies the home user when new e-mails arrive in the mail server, or new messages are recorded on the answering machine.

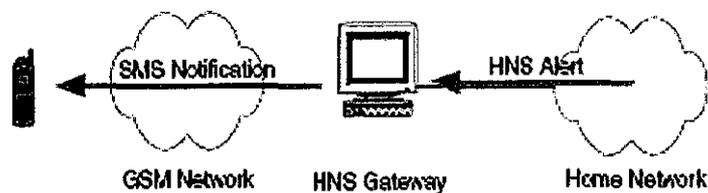


Figure 1.2

## 2.6 HNS management protocol

In HNS, we propose a management protocol that allows managers to configure, diagnose, and maintain home devices that are connected to HNS. The proposed management protocol employs the concept of a client-server model, which, in turn, forms the basis for a manager-agent model (Fig. 1.3). The network management model consists of an agent entity residing in each managed device, and the manager, residing in the HNS gateway, is used to control the devices. The manager issues commands to the agent for reading or modifying the data maintained by the agent. In normal situations, the agent entity only responds to the manager's queries. However, the agent entity is capable of reporting an event to the manager if an abnormal state occurs.

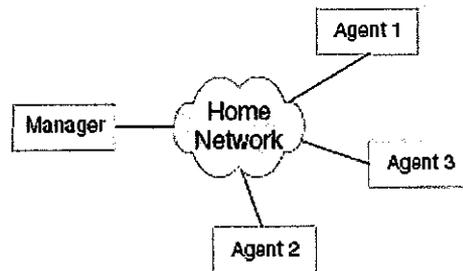


Figure 1.3

The management information transferred between the manager and the agents is handled by the management services. A set of management services that allowed the manager to control, monitor and reconfigure the agents was designed. Within the limitations of mobile handsets such as small screens, limited computing power and memory capacity, however, some services are not suitable for remote monitoring and control of HNS with mobile handsets. Home users are only concerned with the status of home appliances while they are in remote locations; for this reason, two management services (also known as two commands), "HS\_GET\_DATA" and "HS\_SET\_DATA", are employed in the proposed HNS management protocol. The HS\_GET\_DATA command is used to read a data parameter of a specific node, and the HS\_SET\_DATA command is to change a data parameter in a specific node. Conceptually, HNS management protocol contains only these two commands that allow

the manager to retrieve data from a managed agent, or to set data into an agent. All other operations may be defined by these two commands. For example, although we do not have an explicit reboot command in HNS management protocol, an equivalent operation can be defined by declaring a data parameter that gives the time until the next reboot. Thus, the manager can assign the parameter a value (including zero).

The format of the command is shown in Fig. 1.4; the “service” field specifies HS\_GET\_DATA or HS\_SET\_DATA. “Object” fields are atomic entities, and are uniquely identified in a system by an object identifier, with one or more services applicable to them. “Data” is the value of the object and, like object, is optional. The values of several objects can be retrieved or set in a command. Objects for a specific HNS standard are built through cooperation of industry partners who establish the HNS standard.



Figure 1.4

## 2.7 HNS gateway

The HNS gateway provides the interlinking of the controlled home network and the Internet/GSM network. Specifically, such a gateway performs the protocol translations between the controlled home network protocol and the HTTP/ WAP/SMS protocol, allowing for remote interaction and notification. As shown in Fig.1.5, the HNS gateway consists of four parts: (1) an HNS manager responsible for service provisioning, (2) a short message driver responsible for communication between the GSM network and the HNS manager, (3) a WAP gateway, and (4) a Web server responsible for communications between the GSM network/Internet and the HNS manager. The communication protocol between the mobile station modem and the short message driver (reference point A in Fig. 1.5) is implemented using the SMS AT command set [15]. The HNS manager also performs protocol conversions between the HNS

[15]. The HNS manager also performs protocol conversions between the HNS management protocol and HTTP/WAP/SMS protocol. For example, HNS manager employs the functions provided by the short message driver to send alerting messages received from the home network to the mobile station. In addition, the HNS gateway can connect to Internet Service Provider (ISP) mail server through cable, ADSL or dial up. Then HNS manager uses Post Office Protocol—Version 3 (POP3) or Interactive Mail Access Protocol—Version 4 (IMAP4) protocol to send/check mails.

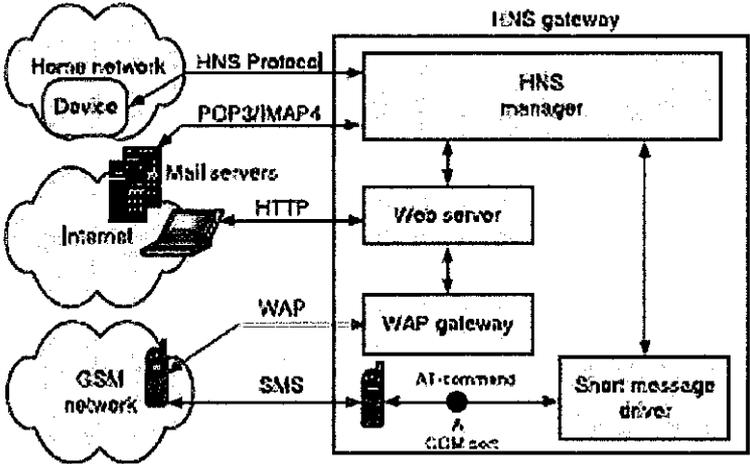


Figure 1.5

## **CHAPTER 3**

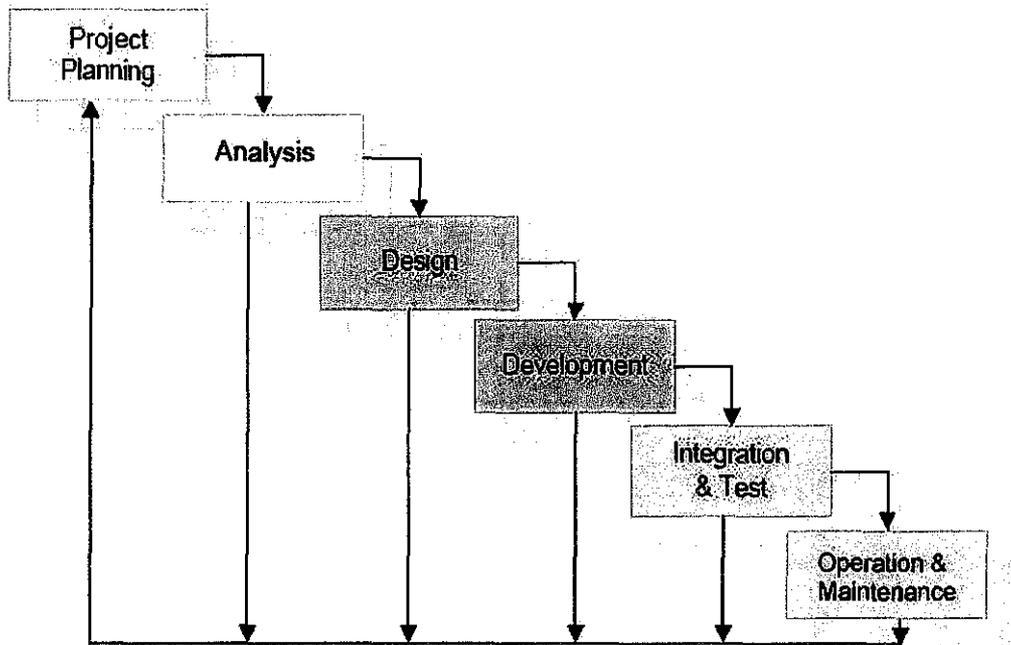
### **3 METHODOLOGY**

This chapter contains the details description of the methodologies and procedure used to complete and achieve the objectives of this project. This includes the development of Internal Parcel Management web based application system embedded with SMS functionality. In order to ensure this project will be managed properly, the objectives and the development process will be according to time period.

#### **3.1 Procedure Identification**

The methodology that has been chose throughout the development of this project is using SDLC approach. Definition System Development Life Cycle (SDLC) is the overall process of developing information systems through a multistep process from investigation of initial requirements through analysis, design, implementation and maintenance. There are many different models and methodologies, but each generally consists of a series of defined steps or stages.

For this project it will be using waterfall model. Waterfall model can be describes as a sequence of stages in which the output of each stage becomes the input for the next. Figure 3.1 below illustrate the Waterfall Model.



**Figure 2.1**

### **3.2 Web based application with SMS functionality development**

The waterfall model will be utilized in order to maximize efficiency in this project development. The model that had been chosen will manage all the phases of the project.

#### **3.2.1 Planning**

In this phase, the objectives of the project had been established. The project schedule has been prepared so that the tasks will be managed properly and complete in time. During the planning phase, all the information regarding the integration of website and SMS application had been gathered. Information gathering was done through the internet, journals and books. All this data will be input for the next step.

### **3.2.2 Analysis**

This project is chosen basically because of the problems faced by current UTP parcel management system. To start the project, all the problems need to be identified first. The best way is to interview the post staff that works and handles these parcels to find out all the weaknesses of the current system.

#### ***3.2.2.1 Interview***

The main post office situated at the chancellor hall. It is managed by two workers. The flow of the delivery process of the parcels started when courier services such as Pos Laju or DHL will deliver the parcels straight to UTP. Then, they will be stored in the UTP main postal office at chancellor hall. Here, all records that associated with the parcel will be recorded using the system that had been developed using Lotus Approach. These data only can be accessed locally. The worker will print out 2 copies of the list name of the parcel's recipient. Later on, parcels for staff and student will be separated. The one for the staff will remain there and for student they will be sending to Lembaran postal office together with one copy of the list name of parcel's receiver.

The copy then will be posted on the Lembaran postal office board. Students who stay in the student resident from any village need to come here and check their name. If their name on the list, they may take the parcel and if not they have to come back later to check again the list. The process is illustrated by Figure 2.2.

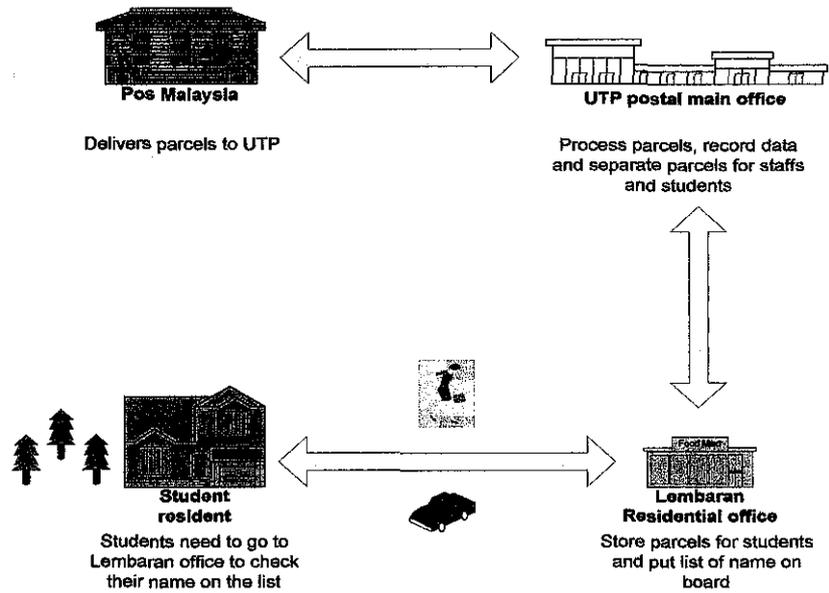


Figure 2.2

### 3.2.2.2 User Requirement

The current system which is developed using Lotus Approach contains a form that recorded certain information on the parcel such as date, sender, receiver, receiver department, delivery company, serial number and note. Below is the snapshot of the current system, Figure 2.3.

The screenshot shows a Lotus Approach form titled "MAIL IN". The form contains the following fields and values:

- TARIKH:** Tuesday, October 11, 2005
- NAMA / SYARIKAT PENGIRIM:** soow wal
- SYARIKAT PENGHANTAR:** Pos Laju
- DOKUMEN / BUNGGUSAN:** Bungkus
- NAMA PENERIMA:** muhammad shehrimen bin samsudin
- NO SUR:** ed 27615399 my
- JABATAN:** VS Student
- CATATAN:** ambil sendiri pada 11.10.2005

Figure 2.3

### ***3.2.2.3 Survey***

A survey regarding this issue had been done in order to gain feedback from students and also to get their response on the solutions that can be provided. A form containing questions on this matter is distributed. From the answers about 95 percent agreed that current system need to be improved. They agreed with the solution suggested. One of the solution is they may access to the latest information on the UTP postal service via the website. They also may track their parcels whether has arrive or not to UTP. Another feature is the SMS functionality that enabled the recipients to get SMS to alert them on the parcel arrival and the place that they may collect.

### ***3.2.2.4 Researches***

The main objective of the project is to provide a web based application that able to send SMS to the parcels recipients. Based on this goal, collection of information regarding the integration of these two technologies is crucial. The information is gathered from internet, books and journals regarding the previous study on these applications. Nowadays, SMS functionality has been embedded in other application such as website, monitoring system, and banking payment system.

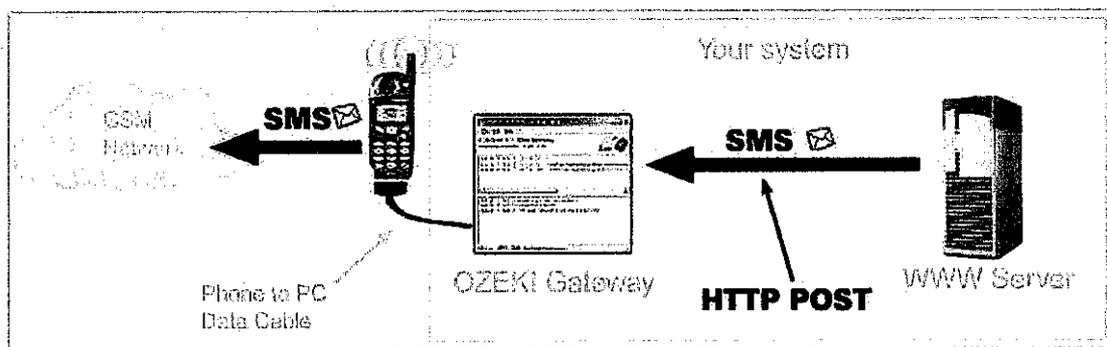
SMS Gateway provides many kinds of Application Programming Interface in connecting between two different technologies. Among them are HTTP/S, SMTP (E-Mail to SMS), SMPP API, XML API, FTP API, and COM Object API. The one that is going to use in this project is using HTTP because it can be used via PHP page.

One of the ways to combine these technologies is by using HTTP-SMS Gateway. To use it, the HTTP-SMS Gateway needs to be installed and configure in a PC that fulfill requirements. The PC must be connected to a mobile phone that support GSM network. This phone will act as the gateway or communication translator between website application and mobile phones. Via that phone web based application in the PC able to

send SMS message to the user. The internal process regarding the text that will be sending by SMS will be managed by HTTP-SMS Gateway.

### **Sending an SMS Message**

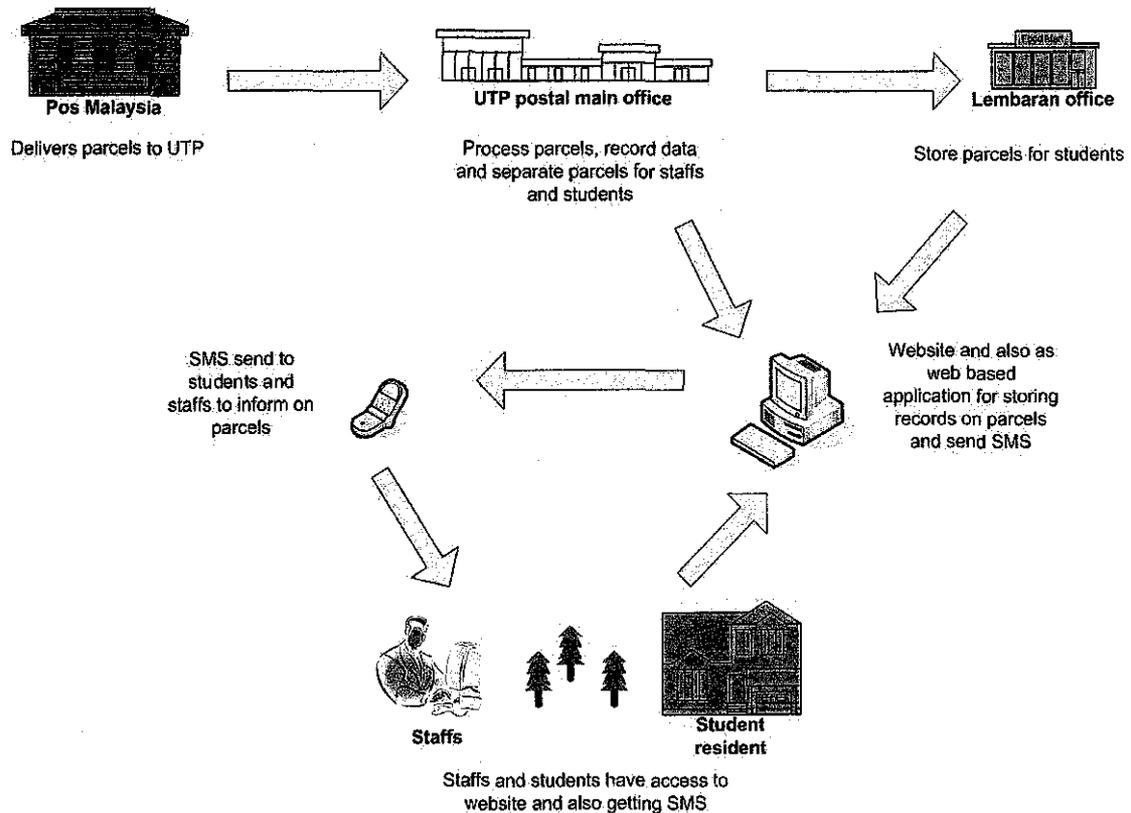
The HTTP - SMS Gateway can be used to send out SMS messages from any application. In order to send a message, the application must perform an HTTP request. The built in web server of the HTTP - SMS Gateway receives the request and adds the posted SMS message to the outgoing message queue. After some time the message will be sent. (The status of the outgoing message can be queried by subsequent HTTP requests)



**Figure 2.4**

### 3.2.3 Design

#### 3.2.3.1 Flow of Internal Parcel Management System



**Figure 2.5**

This new system has eliminating the problems faced by recipient. If they want to check whether their parcel has arrived, just check from the website. Moreover, instead of checking the website, they will get SMS in order to inform them. Students don't have to go to Lembaran office again and again just to check their parcel. Money, time and energy can be saved. The process is now more effective and efficient. There are benefits for postal staffs too as they may now able to update the table from any office, main postal office or Lembaran postal office.

### 3.2.3.2 Use case of Internal Parcel Management System

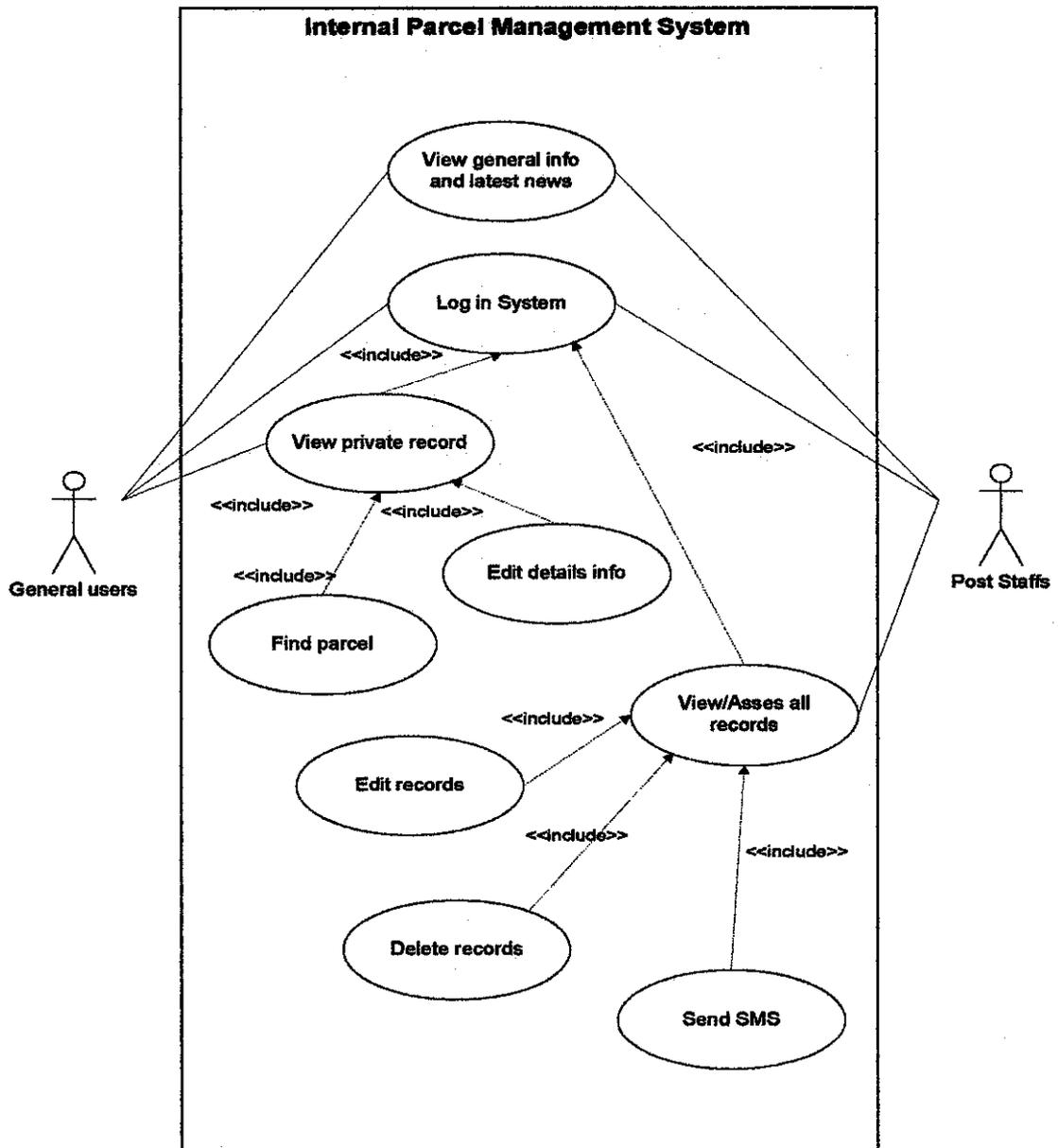


Figure 2.6

## **Description of Use case Diagram**

There are two actors in these use case. The general users represent the UTP staffs and students whereas post staffs refer to postal management office staffs whether in the main office at chancellor hall or Lembaran postal office. For the general users, they may access the UTP postal website to get the general info and latest news about the UTP postal service. Then to check for their parcel, they need to login to the system. The id and the password have been given in advance. If they forget the id, they need to submit their email then the password will be send to them. In case their id not in the system, they may register. Once they login, they will have access to their own list of parcel received. They can't view other record which not theirs. They may find parcel records by sender or arrive date. Using this functionality, they may get the info and track down their parcel to make sure that it has arrive in UTP or still in the delivery. Lastly they may edit their personal details information such as name, phone number and email in case it is wrong or updated.

For the post staff, they will be given username and password by the administrator to enable them to log in into the system. Using this system, the staffs can view all records. They may add new record to store data regarding new parcel came in, by adding the new record, they also capable of sending SMS to recipient in order to inform them that their parcel arrival. Instead adding records, they also can find the existing records in the database. After they get the record they may edit or delete the records. This function can be accessible by staffs in main office and the staffs in Lembaran Residential Office. Using the system, the need to record again the parcels received by Lembaran Residential Office is eliminated. Furthermore, users may get the latest list parcel arrived faster.

### 3.2.3.3 Class Diagram for Internal Parcel Management System

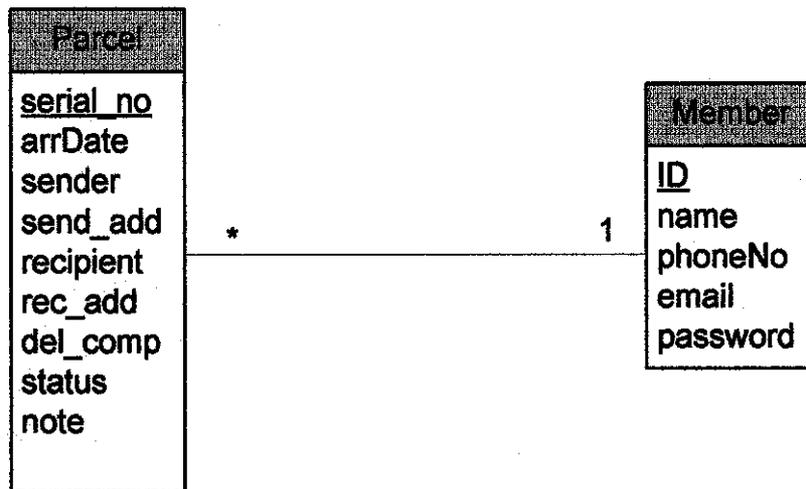


Figure 2.7

The database's name is IPMS. This database contains two tables which are Parcel table and Member table. Parcel table will contains record about the parcel arrive. According to the old system, the information they record contain serial number, arrive date, sender name, sender address, recipient name, recipient address, delivery company, status of the parcel, either it is already taken, not taken, or has been resend to the sender, and note. Primary key for Parcel is serial number. The other table which is Member, contains records on member of UTP either staffs or students. The data attributes are ID, name, phone number, email and password. Phone number data is used for sending SMS. The primary key for Member is ID. For the cardinality is many to one, a parcel is for one recipient, while one recipient may receive more than one parcel. The data in these tables can be added, edited and deleted later on.

## **Constraints**

- **Redundancy of recipients name in the Recipient table.**

The problem with the database is that the name of the recipient in the Recipient's table might be redundant .It is because the recipient cannot be identified through their ID number which every member of UTP had because usually the information stated on the parcel only name and address, and one receiver might get more than one parcel.

- **Inaccuracy in data entered**

The name attribute of the recipient will be used as the key to link between the two tables because it is the only data that similar in both tables. If one of the table record using misspelling name, there might be inaccuracy problem.

## **Assumptions**

Recipients of the parcel are UTP members and their contact data such as id, name, phone number, and email already in the database.

### 3.2.3.4 Flowchart

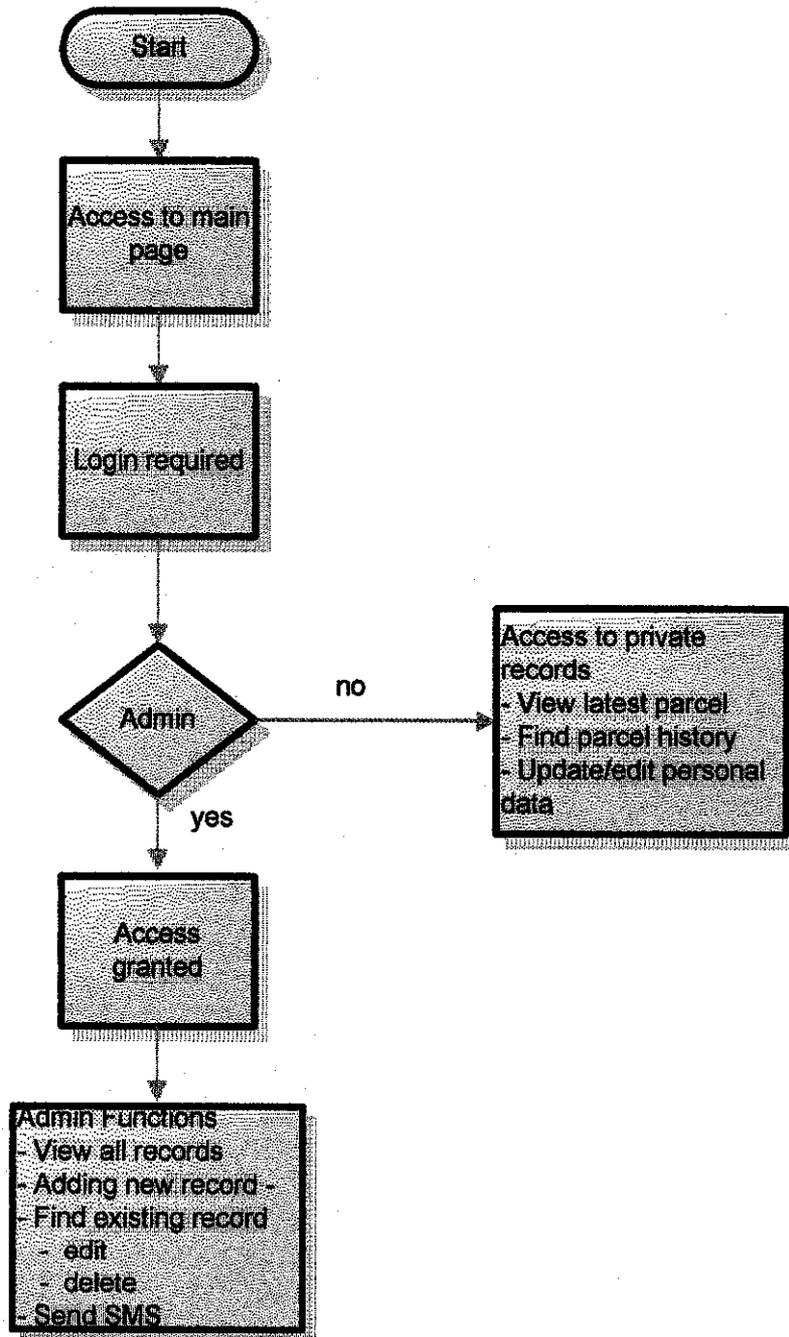
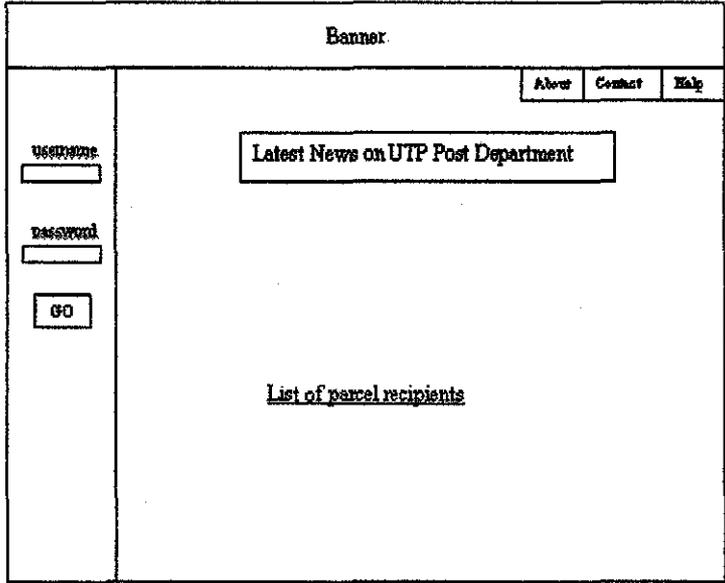


Figure 2.8

Above is the flowchart for the website for Internal Parcel Management System for better understanding. On the main page, the user can see and use the general information such as information and history of parcel department and when the system generated, UTP map, links to website of courier provider, location finder and postcode finder, and contact information which enable user to contact the parcel officer directly regarding the problems or question they want to ask. The latest event and information also will be provided. For general user to check their parcel and for the postal staffs to use the internal system based on access and function granted, they need to login and use the system.

**3.2.3.5 User Interface**

Based on the use case design which list all the functionalities involve in the system, together with the database design which list all the information that need to be collected, and the flowchart, the initial user interface is design. Below are the sketches of the interfaces.



**Figure 2.9**

Search:

<u>Date</u>	<u>SerialNo</u>	<u>Sender</u>	<u>Status</u>
1/2/2006	105542	Ali	Not Taken
6/1/2005	154346	Ahmad	Taken

[Member Details](#)

**Figure 2.10**

Search

<u>Date</u>	<u>Receiver</u>	<u>Depart</u>	<u>Sender</u>	<u>From</u>	<u>Member</u>
2/2/2005	Ahmad	V3	Ali	JB	<a href="#">Member Details</a>
5/5/2004	Lisa	V5	Leong	KB	<a href="#">Member Details</a>
7/4/2003	Raju	V1	Husin	S'ngor	<a href="#">Member Details</a>

**Figure 2.11**

### 3.2.4 Development

The processes start with creating the main page using Dreamweaver software. For the main page, it use html as the page type. The main page has been divided to three frames, top, left and right. On the top frame, there is banner for introducing the user to Internal Parcel Management System of University Technology PETRONAS. On the left side will be the main menu for general user of the website. There are buttons home,

UTP map, links and contact information. Whenever user click on one of this button, the linked page will be appear at the right frame. One more button that is the major function for user is login button that will direct to login page. The login page is the gateway into the internal system.

Before developing the internal system, the database has been created according to database designed before. The database name is IPMS which contains two tables Parcel and Member. They are MySQL database, which created using NetServer application. Using this software, it makes the work of creating and configuring the database is a lot easier and faster.

The internal system has been developed using PHP. PHP has been used in order to link the page with the database. The internal system provides different user access for general members and admin. For general member they only can access their own data. This is to protect data privacy. Regarding the data, they may view and find the records. They also can edit their personal details record. For administrator which is the staffs in control, they will be given access view to all member records, edit, delete and add new one. For additional function they also in charge in sending SMS to recipient in order to alert parcel's receiver.

There had been a little difficulty to link between the two tables. This is because the primary key between two tables cannot be used. The common data that both tables can have is the name of recipient in Parcel table and name of Member table. The problem arises if the data for recipient name in Parcel table has misspelling then it would not match record in Member table. Because of this, it may cause the exact record cannot be find by users. In creating this system, PHPMaker has been used in order to create PHP page. Although it used this software, a lot of customization need to been done to suit the system with the requirement provided before.

While for the SMS function, it will use a data cable which will connect the handphone to the computer. They will interact with the system through a specialized application used for the purpose. The SMS features works when the admin staff key in a new record for a parcel, the parcel will be connected to Member table which contain the recipient information to get phone number. Using the number, a message to inform the recipient will be sent.

Another option will be using the online SMS Gateway provider. Via this, there is no need to using the data cable to connect the phone with the computer. For change, it need internet connection while doing the operation of sending SMS to enable the text messaging application to interact with SMS Gateway provider.

### **3.2.5 Integration and Testing**

There are three major parts of the system which build separately are the main page, internal system and SMS features. The main page of the website is easily developed because it is simple compared to internal system which needs to be linked to the database. The main page has been integrated to the major system through the login features. By using the approved username and password then they are allowed to access their information. For the administrator, they will have the privileges to view, edit, delete, add and send SMS.

For the testing purpose, a few users have been asked to use the system. They are two user which general user and admin staff. For the one who is general user, they find that it is easy to use the system and quite comfortable with the data privacy policy which protect others to see their parcels information. As for the admin, they have no problem in using the functions to view, edit, delete, and add record. As for SMS part, a standard message will be sent as the admin click the 'SendSMS' button which avoid them from having to type the message.

### **3.2.6 Operation and Maintenance**

The system can work well as it is easily used and understood by user. From time to time, the system needs maintenance to make sure that the database will be fully organized and maintain the data integrity and data accuracy. It is important to monitor the performance of the system to recognize the problems that will arise in future. If the problem coming can be seen earlier the solutions can be prepared to prevent the setback from happening. Through this, the system will be more reliable. The monitoring and maintenance part will be handled by the admin who manage the site and the system.

### **3.3 Tools Required**

Basically, in developing a system there will require the involvement of software and hardware in order to produce the products. Below are the software and hardware that will be used:

#### **3.3.1 Software**

- **Macromedia Dreamweaver:** This software will be used to create the interface of the web based system. It is a visual HTML editor. Using Dreamweaver, it not only can create HTML document, but also working well with PHP page.
- **NetServer:** It is an integrated application which combines MySQL with Apache Web Server. Using this software, it is easier to configure the setting and a lot easier to manage the server.
- **MySQL:** This is the relational database management system which also an open-source software product. It will be used as the place to store all data and record from the transaction done by the user of this application. It uses SQL to interact and manipulate data.
- **Apache Web Server:** It acts as the web server that will respond to user requests (from web browser) by providing resources such as PHP. It work parallel with MySQL.

- **PHPMaker:** A software which helping in creating PHP page.
- **HTTP-SMS Gateway:** SMS Gateway is software utility that enables you to easily send and receive text and binary "Short Messages" over GSM/PCS digital cellular telephone networks from your local PC or network.

HTTP - SMS runs as a service on the Windows NT, 2000, XP server. It communicates with the phone attached to the server with a phone-to-PC data cable or via SMS Gateway provider. It collects the short text messages that arrive to the phone and passes them to web application. The web application can send out text messages by passing them to the HTTP-SMS gateway.

### 3.3.2 Hardware

<b>Computer Hardware</b>	Intel compatible PC Intel 266Mhz CPU or better 64 MB RAM 20 Mb hard disk space
<b>Operating system</b>	Windows 95,98,Me, 2000,Xp
<b>Suitable mobile phone</b>	Mobile phone that support Global System for Mobile communication.
<b>Phone-to-PC data cable</b>	A phone-to-pc data cable or an Infra Red port (IR) or a Bluetooth connection is needed

## **CHAPTER 4**

### **4 RESULTS AND DISCUSSION**

The expected result will be a website which has access to a dual purpose system. It is as a interaction medium between admin and general user and also as an internal system in recording parcel's information. The system is for general user and admin user. The general user will have access to their private data and admin will have access to several other functions. The normal functions for admin such as adding records, view, edit and delete. The other function is to send SMS to general users. This is where the SMS capability has been integrated with the website based system. The major focus is on the process of integrating the website with SMS functionality. There are a few ways to use this function. Below are examples of the methods available.

#### **4.1 SMS Gateway Service Provider**

Connect the website or software application to the carrier-grade SMS Gateway, allowing user to send global SMS messages in minutes. The SMS gateway service provider offers simple connectivity to their SMS servers through a range of API (Application Programming Interface) interfaces including protocols HTTP, SMPP, SMTP, FTP, XML, Com Object.

By using HTTP, which needs to be online, the user which in this case the admin need to register with the provider and buy the credits. It can be used either in the form of a HTTP POST or GET, and supports Text, Flash, Unicode and 8-bit SMS messaging. In the registration, the username, password and api\_id. One of this SMS gateway services provider is Clickatell. Different from method discussed before, by using this HTTP, the user will only need to register to the service provider and only pay for the credits used in sending message.

Using the Messenger-PRO bulk SMS software, it enables the bulk messaging, the simplest and easiest way to send individualized, bulk text messages (SMSs) globally. It is an effective way to send group messages such as event notifications, promotions or bulk SMS alerts. It will allow user to import their contacts database (e.g. exported from Excel or Outlook) into an online address book that can be easily managed through an intuitive web-based interface. In order to use these methods user need to be connected to internet.

#### **4.1 SMS Server**

SMS Server is an efficient tool that makes sending and receiving SMS messages from a computer easy. It uses a GSM phone connected to the PC with a phone-to-pc data cable. The software can be used as a standalone SMS communicator or can be attached to other systems to accomplish automatic messaging as an SMS gateway.

Message Server can be used to send out SMS messages from any application. In order to send a message, the application must perform an HTTP request. The built in webserver of the Message Server receives the request and adds the posted SMS message to the outgoing message queue. After some time the message will be sent. The developers can integrate SMS messaging functionality into their applications very easily. For example if an SMS message needs to be send, it can be inserted into a database table used for outgoing messages. The Message Server monitors this table and delivers the message. The Message Server puts all received SMS in another database table used for incoming messages.

Throughout the study there are a few drawbacks in using this approach. One of the reasons is it need more hardware to work with. A data cable, Bluetooth, and compatible mobile phone that support GSM network are needed. In some cases, a driver needs to be installed according to mobile phone model. furthermore, the mobile phone connected to PC need to be recharge. For one computer which contain SMS server, a license need to be purchased and later on any update on the software used will be charge. This method involve more cost and a little tedious.

## **CHAPTER 5**

### **5 CONCLUSION AND RECOMMENDATION**

This system managed to achieve the objectives of the project. It is an online system which provides the communication between general and admin which has given facility to both parties. There were some limitation that been faced in developing this system such as having not enough budget and limited knowledge which affect the flow of the system being built.

There are many rooms for improvement throughout this project. There are a few recommendations that can be suggested in order for the system to provide better services to the users. One of the ideas is to make the website more interactive by including dynamic pages which allow the use of flash and dynamic menu. The functions also can be added so that the user will have access to many kind of information.

Instead of sending message to recipient, in future the capability of the system may be can be widen by also enable the application to receive message from user. This will make two way communications instead of one way communication. It will be more interactive and efficient. The general user will be informed by the system that their parcel has arrived and they may reply to the message saying that the message has been received or inform them if they want to take the parcel on what day.

In developing the system, instead of using HTML and PHP the system may use XML/XHTML or WML. It could be carried out on non-PC platforms such as palm computers, televisions, automobiles, telephones, etc. In most cases these devices will not have the computing power of a desktop computer, and will not be designed to accommodate ill-formed HTML as do current browsers (bloated with code to handle

sloppy or proprietary HTML). So in future may access the website not just through their PC but also via their phone anywhere anytime, it increases the portability of the system.

Additional function such record all the message send can be add on future enhancement. By this, the admin will know whether the message has been send, successfully send or not. Bulk messaging which allow sending message to many persons in one click can be used instead of sending one by one to make the process more efficient.

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# APPENDICES

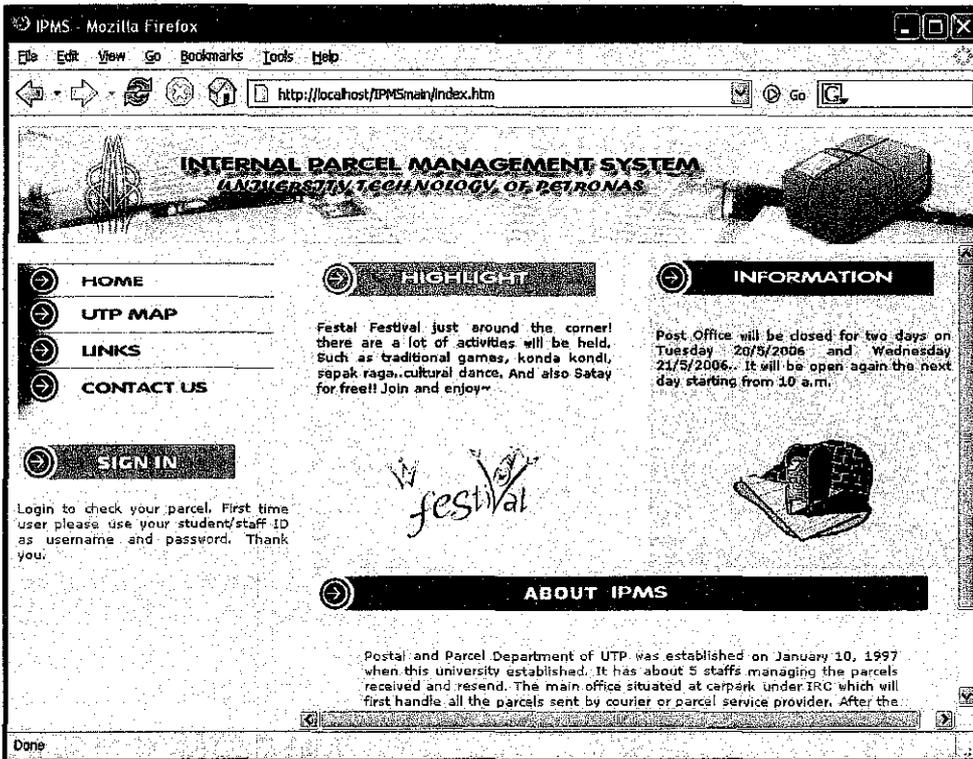


Figure 3.1

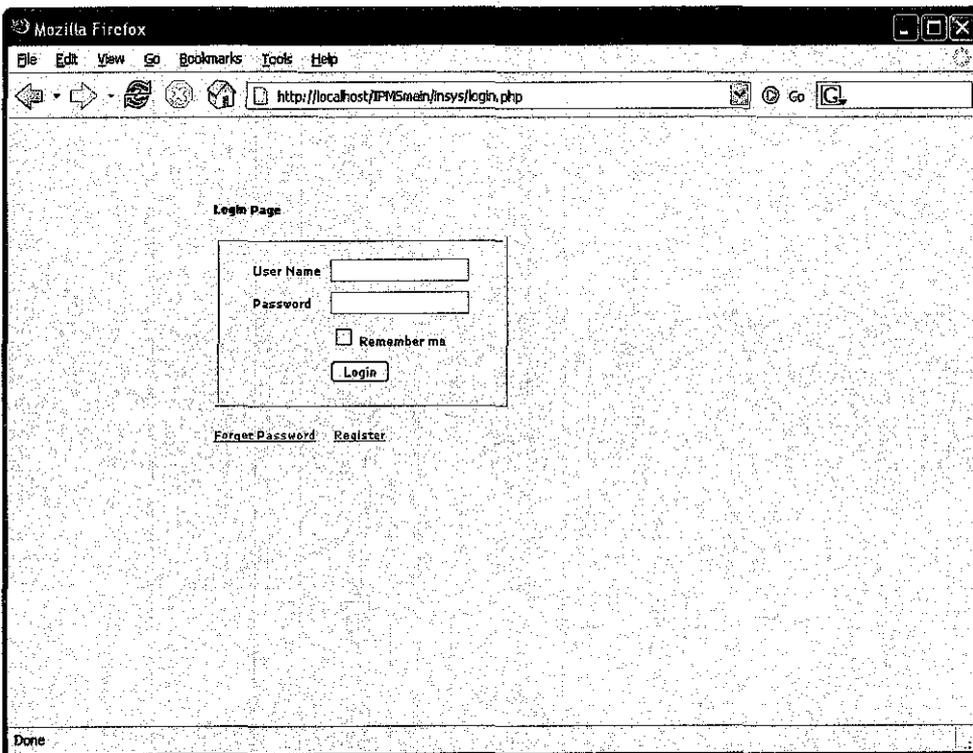


Figure 3.2

