

**Online Help Desk Development for the Residential Villages Facilities in the
Campus**

By

Yugentharan a/l Shanmugam

10051

Dissertation submitted in partial fulfillment of
the requirements for the
Bachelor of Technology (Hons)
(Business Information Systems)

January 2011

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CERTIFICATION OF APPROVAL

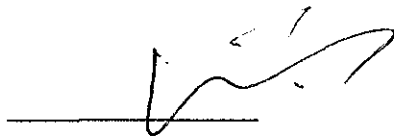
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A project dissertation submitted to the
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JULY 2010

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 acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources of person.



YUGENTHARAN A/L SHANMUGAM

ABSTRACT

This report basically focuses on the University Technology PETRONAS (UTP) Online Residential College Maintenance System. This project is aimed at developing an online portal for the residential villages in the campus. This is an Internet based application that can be accessed anywhere that has an active internet connection. Registered users (students, village supervisors and maintenance staff) will be able to log in a request for service for any of the supported facilities. These requests will be sent to the concerned people, who are also valid users of the system, to get them resolved. It is hoped that this project can be a projectile to make it easier for the logging in of complaints and request regarding the facilities in the residential villages as well as making it easier for the maintenance of the residential villages in University Technology PETRONAS. As for the research elements of the project, it will incorporate the study on of how this online system can help to support the workflow and maintenance of the residential villages and also to check the successfulness of this portal to make the maintenance process to be more organized and faster. This system includes the functionality such as user login, information storage and retrieval, report conformation and etc. Detailed research and information gathering has been done throughout the semester to learn about the basis to execute this project with certain software's and databases. The research that has been done is also included in this report for better understanding of the purpose and requirements that are needed to undertake this project successfully. Most of the resources that have been used are from the internet and also from further reading in hardcopy books as well as online journals and articles. The software prototyping methodology has been selected to better manage the task throughout the project development given its flexibility when it comes to dealing with changing system requirements and time management. This report presents the background of the project which includes problem statement, objective of the project, literature review and methodology to carry out the project. Besides that, some related works are also provided in order to show similar works that have been carried out and some of the technologies that can be implemented.

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

The implementation of online portals and help desks has been emerging at a rapid pace in the internet era. A portal aggregates information from multiple sources and makes that information available to various users. In other words, a portal is an all in one website used to find and gain access to information and also one that provides the services of a guide to the users. As the online system has become a major part in the education industry, business industry and services industry, people nowadays demand a more easier and simple way to proceed with their daily tasks and activities. People prefer to do their work online instead of manually using a pen and paper because of the technology era that plays a major role in our daily lives. Using online systems and web portals are much faster compared to doing it manually.

Specifically focusing on University Technology PETRONAS, the online help desk for residential villages will support the workflow and maintenance of the residential villages and also to make the maintenance process to be more organized and faster. The facilities in the residential villages are very comfortable and adequate but currently the lodging of complaints for the facilities has to be done manually and is not efficient. So, after some research and surveys have been done, the idea is to develop the online portal help desk systems for lodging of complaints regarding the facilities in the residential villages which will enable the user to lodge their complaints online using the internet.

1.2 Problem Statement

University students always have difficulties when the certain facilities in the residential villages such as maintenance in student rooms, cafeterias, and common rooms facilities are malfunctioning or not working. Students have to personally go to the residential college support unit to file their complaints. After filing their complaints manually, then the complaint will be processed and then the support staff will provide the appropriate service to the students. The problem is how to create a more organized and convenient way for the students to register a complaint regarding the facilities. Here are some of the problems that are encountered when reports are lodged manually:

- Residential College Support Services (RCSU) staff are not available at the time the student goes to file a complaint. The staff might be away for meetings or other agenda's to be attended.
- After a report is lodged, it takes time for the administrative staff to notify the maintenance and service staff about the problem. This results in the maintenance to the facilities to be done usually after 2 or 3 days. Inconvenience is caused to the students who are affected by the malfunctioning facilities such as broken doorknobs, lights or even kitchen appliances.
- Lodging complaints during weekends or short holidays such as mid semester breaks where most local students tend to go home but the foreign students stay back in UTP. Any complaints have to be done in the Residential College Support Services (RCSU) office where the staff might not be available. This will cause inconvenience to the students as they will not be able to lodge their complaints and the maintenance will be done slowly.

1.3 Objective

To develop an online help desk portal for the residential villages in the campus which can be accessed from anywhere that has an internet connection and a working internet browser.

1.4 Scope of Study

Due to time limitation of this project, the to-be-developed system will cater for the following functions only:

- **Security** - The system provides the login function in order to ensure there is no pranks, cheating or fake complaints lodging from the users which will most probably students. This login function can be done because the University Technology PETRONAS has a lot of students and staff with their own ID number, so I am planning to use the ID number as the variable in the online help desk portal login process.
- **Informative** - The system will provide and display all the required information that needs to be filled in by the user regarding the complaint to be stored such as facilities and comments. After this, by using this function, the user can view back the complaint that has been lodged as well as post comments in the main page after the login. These comments can be read by other users of the system. The complaints will be stored in MySQL Database.
- **Integrity and Reliability** - The system will record all the complaints that have been submitted to the online help desk portal to a database which can be accessed by the administrator of the system. The user will feel safe and confident about their complaint that has been lodged and the administrative staff will be notified about the complaint and then proceed to notify the maintenance staff to do the maintenance.

CHAPTER 2

LITERATURE REVIEW

2.1 Online Help Desk System

Online Help Desk systems are being introduced into the digital world nowadays to provide the easiest and fastest way to help and guide people regarding processes and work as well as enquiries. As the internet becomes the norm of life nowadays, the business people realize that they need to do something to change their way of doing business and realize the importance of having online help desks to support their business operations. An Online Help Desk is defined as a service that provides information and assistance to the users of a computer network [1]. Online Help Desks help to provide supplemental support for your internal help desk [2]. Help Desks also provide extra resources to cover and support unplanned emergencies, and also coordinates interactions across all channels in real time [3]. The most important advantage that a web based online help desk system can provide is that all of the users can take advantage of it with only a simple web or internet browser [4]. There are no installations necessary to individual systems. Which means the system is accessible from any computer with an Internet connection and a web browser [5]. The World Wide Web (www) offers the possibility of a new, relatively inexpensive, and effectively standard user interface to help desks and appears to be encouraging more automation in help desk service. This will provide a more organized idea of how to handle the problems that come in [6]. Educational Institutions have also actively started to use online campus support to provide convenience, 24-hour support operations and easy service request management by using the campus portal. Example of University that is

using this online campus support portal is Nanyang University in Singapore [7]. Our very own University Technology of PETRONAS also has an online portal which is called Portal for Integrated Student Management System (PRISM) [8]. There are also companies that provide development of Customer Service Software that can be used by educational institutions as online campus support. One example of a company that provides such services is PARATURE [9].

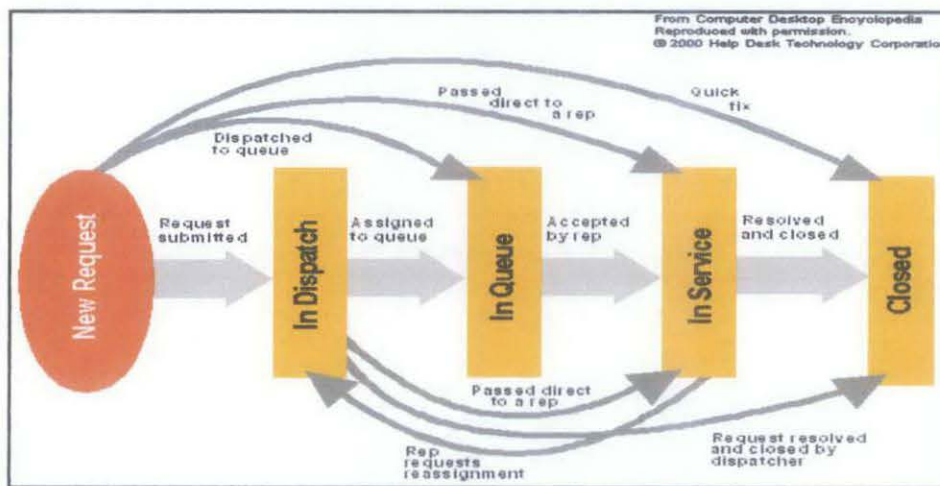


Figure 1: Online Help Desk Sequence/Flow

2.2 Server Side Scripting

Server side scripting is a tool in creating dynamic web pages (two way communication between server and user) by running script on the web server. The biggest benefits of using server side scripting is the ability for webmaster to highly customize the response based on the user's requirement, access rights or queries into the data stores [10]. There are several type of server side scripting such as JSP, PHP, ColdFusion and LSP. PHP and ASP are among the mostly used for the software application. The example of the server side scripting system is Facebook, Formspring, MySpace, Ebay and other

dynamic websites. It is widely used for creating programmed features for Web sites because its syntax is drawn from other widely used language [11].

2.3 HyperText Markup Language (HTML)

HTML, which stands for HyperText Markup Language, is the predominant markup language for web pages. HTML can be considered as the basic building-blocks of webpages. HTML is written in the form of HTML elements consisting of tags, enclosed in angle brackets (like <html>), within the web page content. HTML tags normally come in pairs like <h1> and </h1> [12]. The first tag in a pair is the start tag, the second tag is the end tag. In between these tags programmers can add text, tables, and also images.

The purpose of a web browser such as Mozilla Firefox and Internet Explorer is to read HTML documents and compose them into visual or audible web pages. The web browser does not display the HTML tags, but uses the tags to interpret the content of the page. HTML elements usually form the building blocks of all websites in the internet [13]. HTML allows images and objects to be embedded and can be used to create interactive forms and pages. It provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes and other items [14]. It can embed scripts in languages such as JavaScript which affect the behavior of HTML web pages. Web browsers can also refer to Cascading Style Sheets (CSS) to define the appearance and layout of text and other material.

2.4 Cascading Style Sheets (CSS)

Cascading Style Sheets (CSS) is a simple mechanism for adding style such as fonts, colors and spacing to web pages and documents. External Style Sheets can save a lot of work because it is stored in CSS files. CSS is designed primarily to enable the

separation of document content written in HTML or a similar markup language from the actual document presentation which includes elements such as layouts, colors, and fonts [15]. This separation can improve the content accessibility which will provide more flexibility and control in the specification of presentation characteristics. It also enables multiple pages to share the same formatting, and reduce the overall complexity and repetition in the structural content. CSS also allows the same markup page to be presented in different styles for different rendering methods, such as on-screen, in print and also by voice[16]. While the author of a document typically links that document to a his/her own CSS style sheet, general readers who are browsing through the document can use a different style sheet, perhaps one on their own computer, to override the one the author has specified in the source formatting. CSS specifies a priority scheme to determine which style rules apply if more than one rule matches against a particular element. In this so-called cascade, priorities or weights are calculated and assigned to rules, so that the results are predictable [17]. The CSS specifications are maintained by the World Wide Web Consortium (W3C).

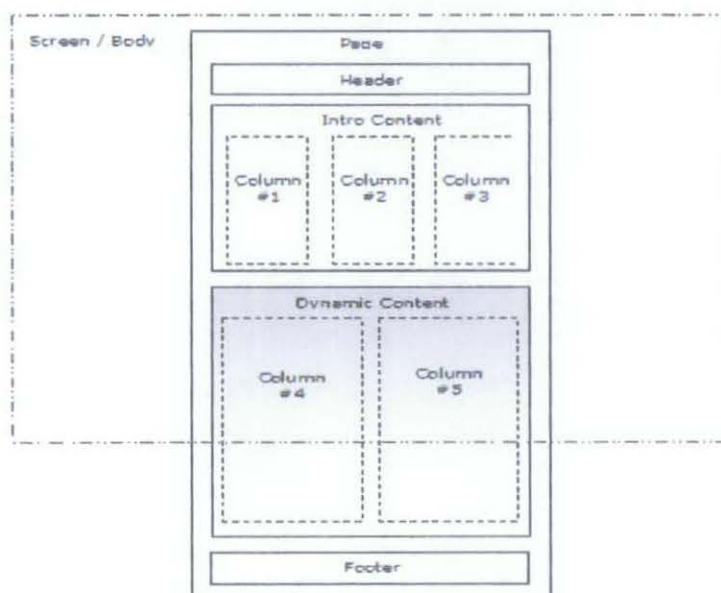


Figure 2: Cascading Style Sheet page structure formatting

2.5 PHP: Hypertext Processor

The usage of PHP is possible as it designed for web development to produce dynamic web pages. When putting together the system, there are certain chunks of programming that are needed again and again, such as database and user authentication [18]. To ensure the codes organize and tidy, PHP files as known as classes can be wrapping together. Objects of these classes can be then created whenever they are needed. Thus, the class can be thought of as a blueprint for one or more objects [19]. This programming approach will ease the user to manage, modify and error checking. Some examples of the PHP usage include:

- Presenting data from a variety of sources such as databases and files
- Incorporating interactive elements such as search function.
- Performing actions such as sending request.

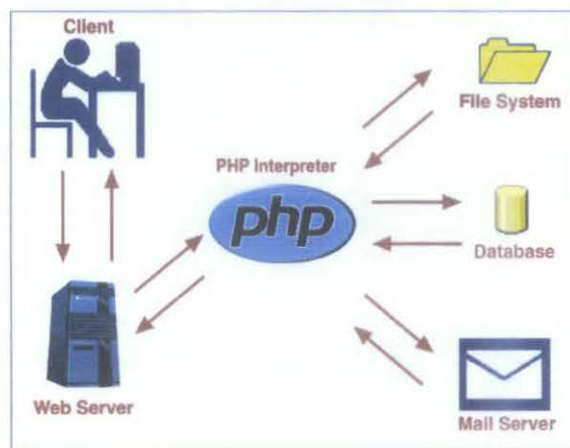


Figure 3: How PHP works

2.6 Database Management System

A DBMS (Database Management System) as known as database manager is a program that lets one or more computer users create and access data in the database. From

technical perspective, there are 4 DBMS version such as relational, network, flat and hierarchical; they all refer to the way the information is internally organized [20]. This internal organization involves about how quickly and flexibly the information can be extracted.

The following are some of the most widely used DBMS as mention in [21]:

- a) Oracle
- b) MySQL
- c) Informix
- d) MSSQL
- e) Firebird
- f) PostgreSQL

2.6.1 MySQL

MySQL is one of the most popular open source databases that use SQL, the language for adding, accessing and processing data in a database. The MySQL has become the most popular open source database because of its consistent performance, high reliability and ease of use. One advantage about MySQL is that can be scaled down to support embedded database applications [22]. Perhaps it is because of this reputation that many people tend to believe that MySQL can only handle small to medium-sized systems.

2.7 Web Servers

A web server can be referred to as either the hardware or the software that helps to deliver content that can be accessed through the Internet. The primary function of a web server is to deliver web pages on the request to clients. This means delivery of HTML documents and any additional content that may be included by a document, such as images and style sheets .A client, commonly a web browser will initiate communication by making a request for a specific resource using HTTP and the server responds with

the content of that resource or an error message if it is unable to do so[23]. While the primary function is to serve content, a full implementation of HTTP also includes ways of receiving content from clients. This feature is used for submitting web forms, including uploading of files. Many generic web servers also support server-side scripting such as Apache HTTP Server and PHP [24]. This means that the behaviour of the web server can be scripted in separate files, while the actual server software remains unchanged. Usually, this function is used to create HTML documents which are considered to be dynamic.

2.7.1 XAMPP

XAMPP is an integrated server package of Apache server, MySQL and PHP. The usage of such a combination of technologies defines a programming paradigm of developing software, and establishes a software distribution package [25]. The XAMPP architecture has become popular in the Web industry as a way of deploying inexpensive, reliable and secure web application. The XAMPP bundles the following applications:

- Apache Web Server
- PHP 5, server side scripting
- MySQL data server

CHAPTER 3

METHODOLOGY

3.1 Main Tasks

This project will be developed in 2 phases which are:

Phase 1: Collecting the requirement and analysis of the critical or important data that will be included in the system.

Phase 2: After the requirements are clear, we will start developing the system in this phase using the prototype methodology.

The Software Prototyping and Spiral Development have been identified to employ techniques that could lead to a successful implementation of this project.

3.1.1 Software Prototyping

The software prototyping employs prototypes to demonstrate system's capabilities, try out design options and get a clear understanding of the problems and its possible solutions. A channel of communication is created between the end-users and the developer through the prototypes early in the software process. Areas of strength and weakness are identified through this approach.

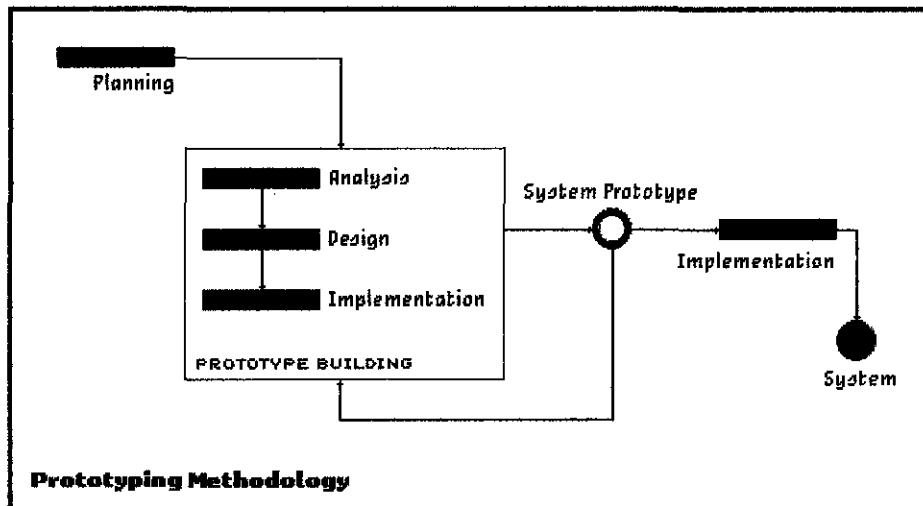


Figure 4: Prototyping Methodology

The prototyping methodology involves the 4 following steps:

1. Identify the basic requirements of the system including the input and output information that is desired.
2. Develop the initial prototype that includes simple user interfaces.
3. Review the prototype with targeted end users to gather feedback on any additions or changes that can be made.
4. Revise and enhance the prototype using the feedback that has been gathered. Specifications can be improved, but it is important to remember that a negotiation may be necessary to redefine what is within the scope of the project. If changes are introduced to the project, step 3 and 4 shall be repeated.

The main objective when using this approach is to develop a very robust prototype in a predefined structured manner and constantly refine it accordingly. By doing this, the initial prototype will form the core of the new system and any improvements are built upon it. The time frame allocated to build this project is limited. The software prototyping methodology is known to be the best in managing system development where there is not much time allocation. Benefits of this software development methodology includes user engagement with the system as not only is the system more

likely to meet user requirements, user are more likely to commit to use the system.

3.1.2 Spiral Model

The spiral model combines elements of both design and prototyping in an attempt to exploit advantages of top-down and bottom-up approach.

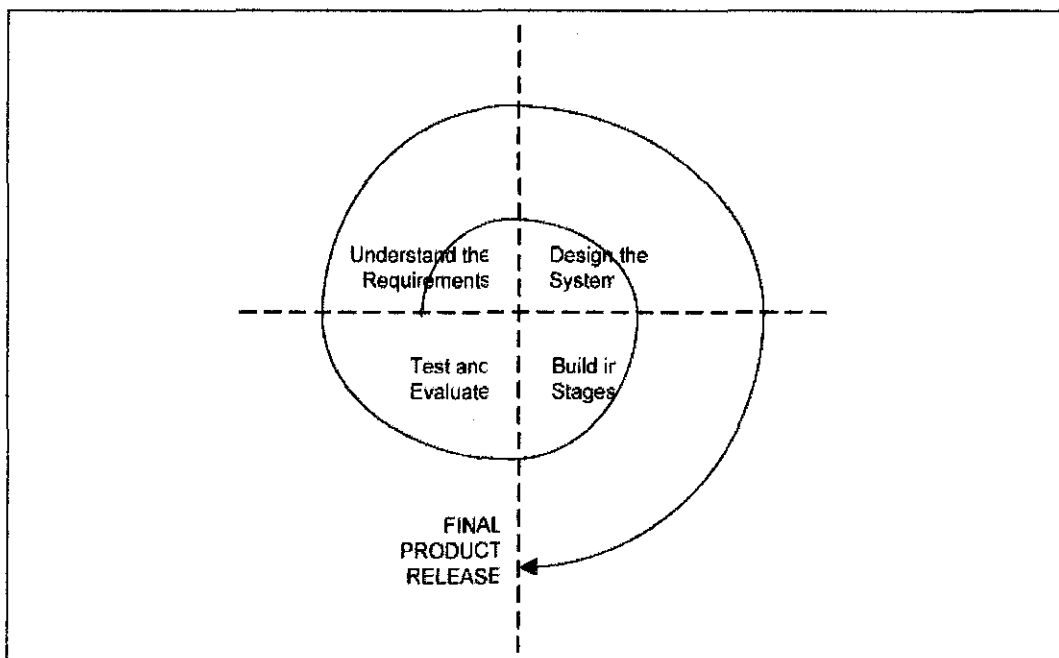


Figure 5: The Spiral Model

By using this approach, the new system requirements are defined as detailed as possible. This usually involves interviewing a number of users representing all the external or internal users and other aspects of the existing and current system. A preliminary design is created for the new system. Then, a first prototype of the new system is developed from the preliminary design and is a scaled down version of the final report. The spiral model is favored for large, expensive and complicated projects

as estimates of the budget and schedule become more realistic as the development work progresses because of the question that are eventually raised throughout the iteration. It is easier to cope with the changes to the software development and software engineers can start working on the project earlier rather than wading through a lengthy early design process.

3.1.3 Tools and Techniques

A number of tools and techniques have been identified to accomplish the development of the project. PHP has been selected as the server side scripting language over ASP for being cross platform and open source. ASP natively supports only Access and MYSQL. XAMPP solution track has been selected to provide the following installation:

- Apache Web Server
- PHP 5, server side scripting
- MySQL data server
- Mozilla Web Browser

The above installations will allow back end compatibility with the Computer and server during the development and testing phase.

3.2 Project Gantt Chart

Please refer to Appendix A.

CHAPTER 4

RESULTS AND DISCUSSIONS

4.1 Naming of System

Based on the project planning during Final Year Project 1, the proposed name of the system was to be “Online Help Desk Portal for Residential villages in UTP”. After due consideration, it was decided that this name is not suitable for the system as it is too long. I have done some research in the internet regarding E-facilities that is being provided by various companies and organizations. From this finding, it was decided that the system’s name would then be changed to “Room4U”. The idea of coming up with such a name was based on real life examples being used by outside companies such as “Maybank2U”, “CIMBClicks”, and “MyEG”. All the stated examples used short and catchy, yet meaningful names for their E-Services so it was decided that this system would adopt a similar approach. The name “Room4U” is short and simple as it also means room services for you.

4.2 System Architecture

For the system architecture of the project, it will be divided into 2 categories which are:

- Real System Architecture
- Prototype Architecture

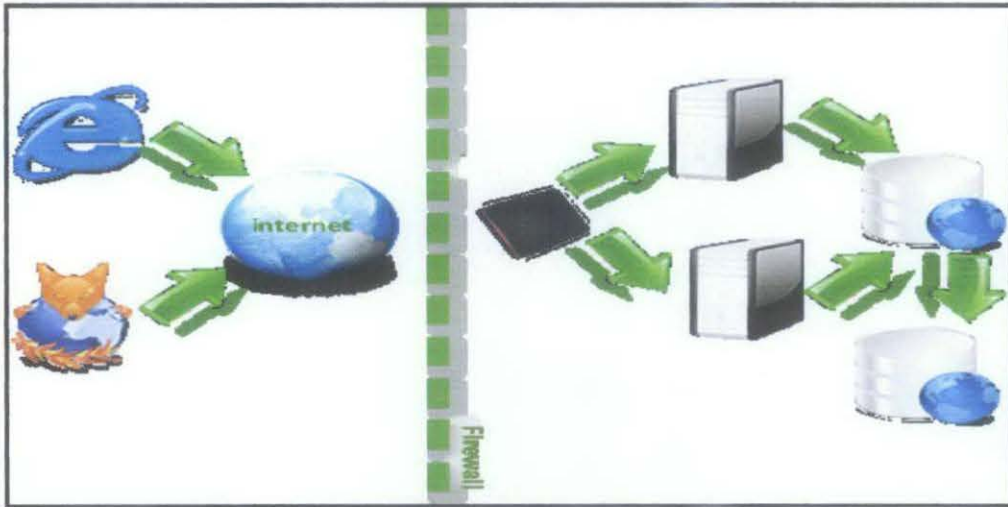


Figure 6: Real System Architecture

The Figure 6 describes the real system architecture which is intended to be used by the Online Help Desk Portal. As portrayed in the figure above, internet browsers such as Mozilla Firefox and Internet Explorer can be used by the users in order to load and view the online portal page. To access the portal, browser is used and connected through the internet (by entering the URL address of the online portal). The server will then load the entire online portal page to the user browser which will enable the user to view and access the portal.

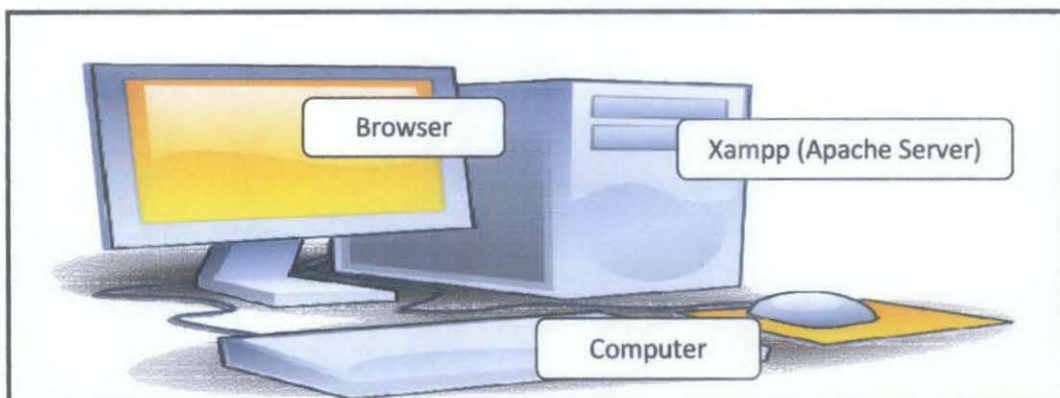


Figure 7: Prototype System Architecture

For this online help desk portal development, I intend to be using the prototype system architecture as shown in Figure 7. For the prototype architecture, a computer is used as the Server (Local host) and the portal page can be viewed by using the computer browser. No internet connectivity is needed during the prototype system architecture. Only after the system is completed, reviewed and ready to be released for actual use and implemented, I intend to implement it as Real System Architecture shown in Figure 5.

4.3 System Functionality

The proposed system functionality can be depicted by the activity and use case diagram in the following figures:

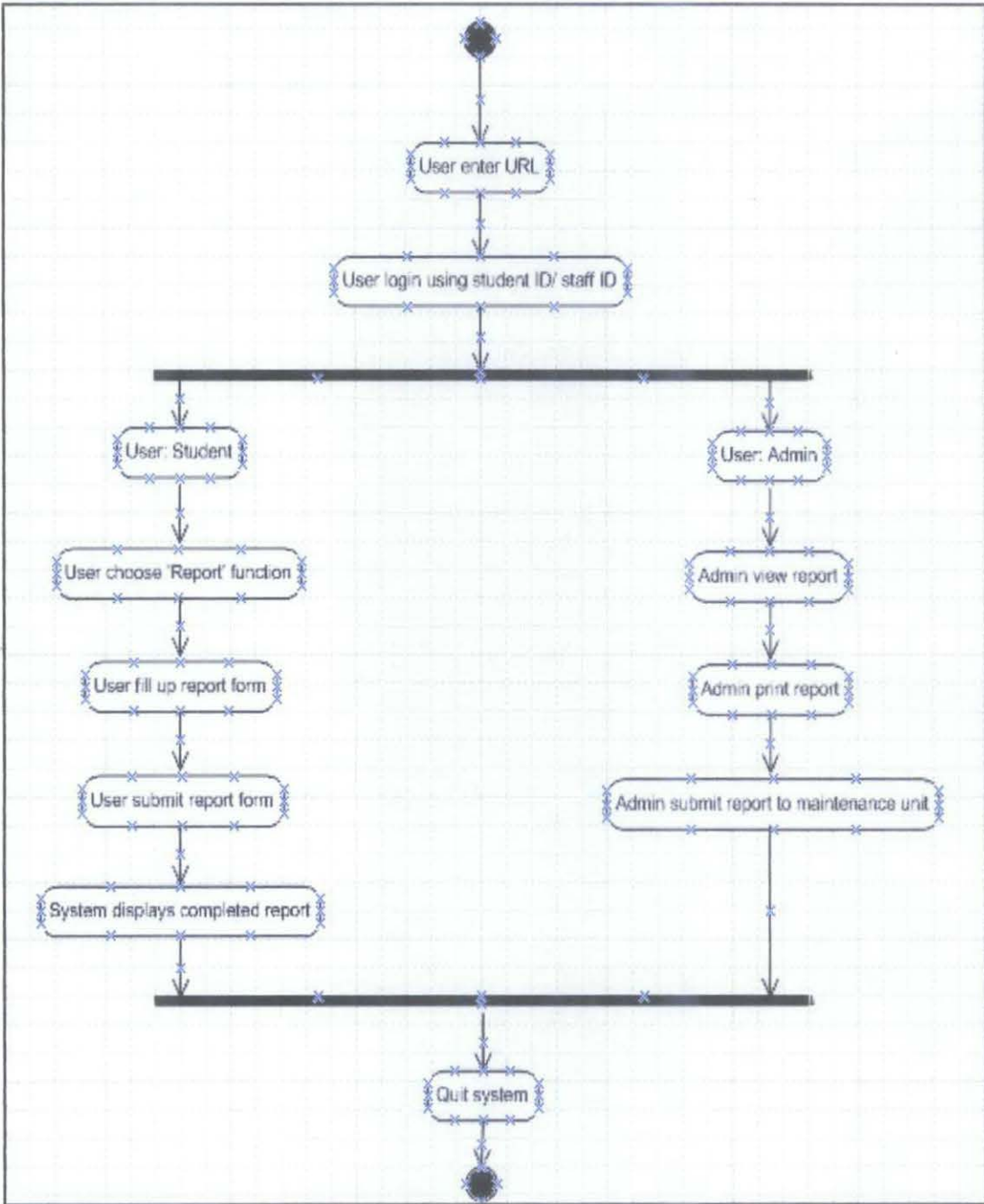


Figure 8: Activity diagram

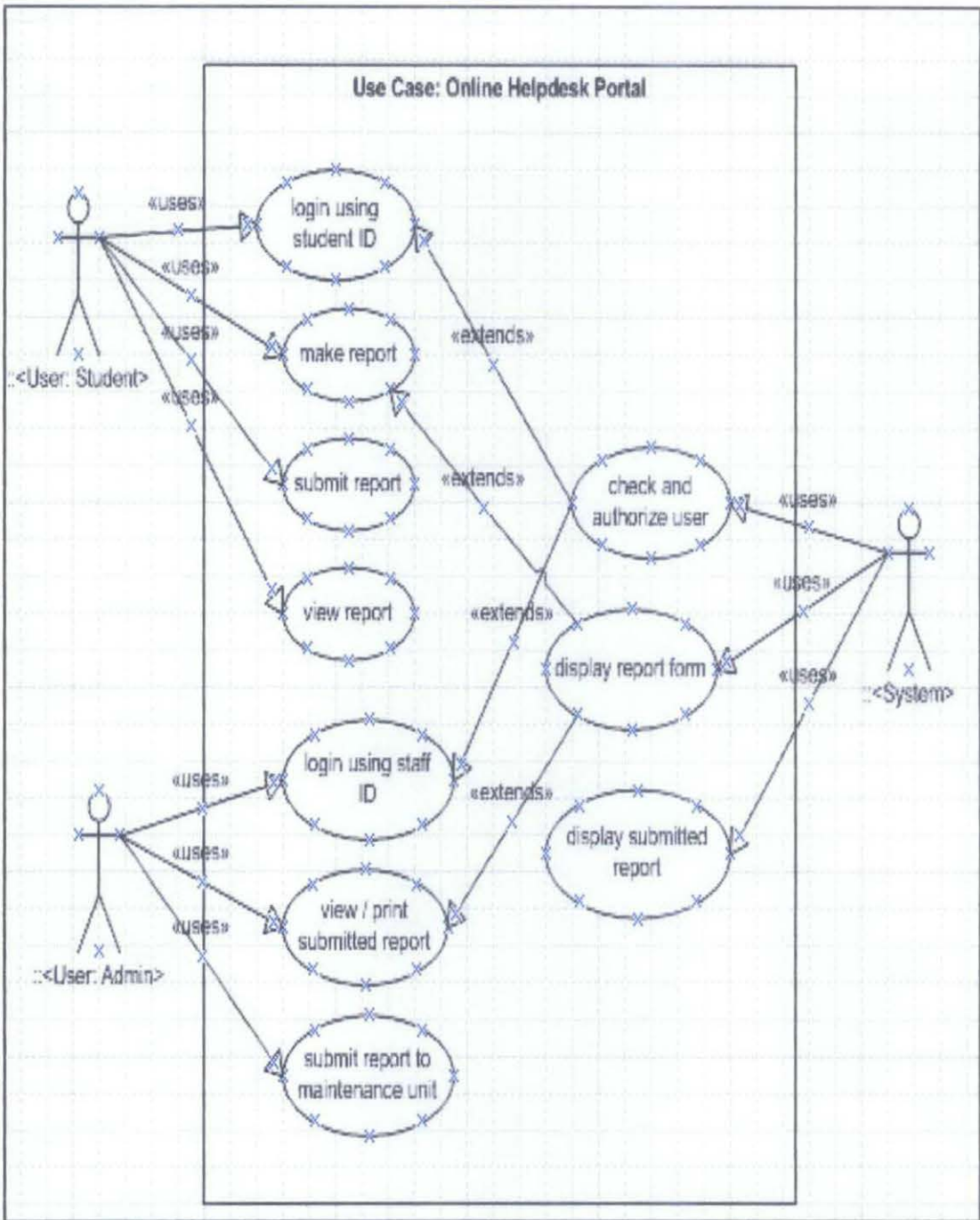


Figure 9: Use Case Diagram

4.4 System Behavior

The proposed system behavior can be depicted by the sequence diagram which is use to depict the internal view of processes that use case describes or dynamic view of the system.

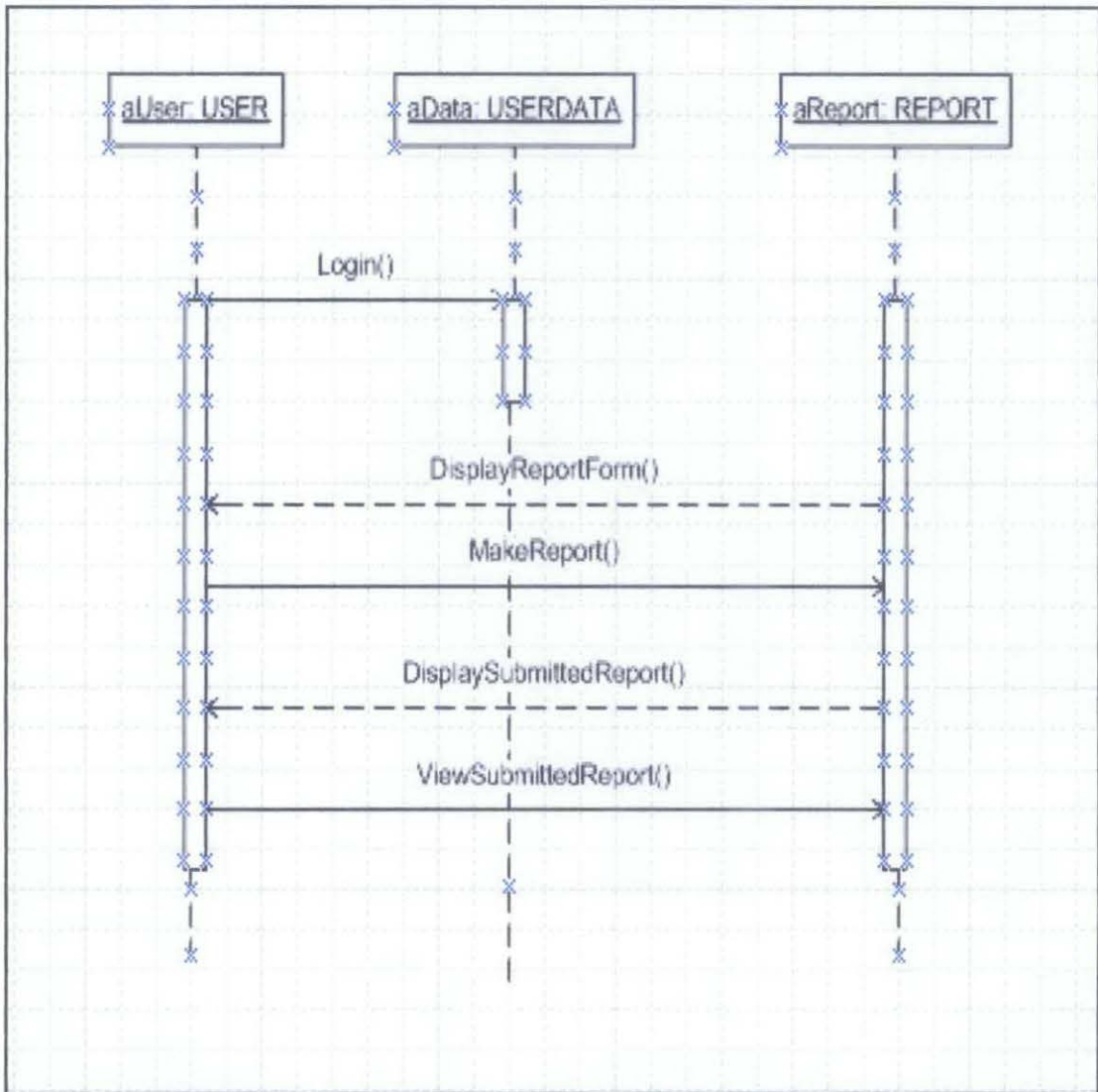


Figure 10: Sequence Diagram

4.5 System Structural

The proposed system structural can be depicted by the class diagram which represents the responsibilities of each class and the collaboration between the classes.

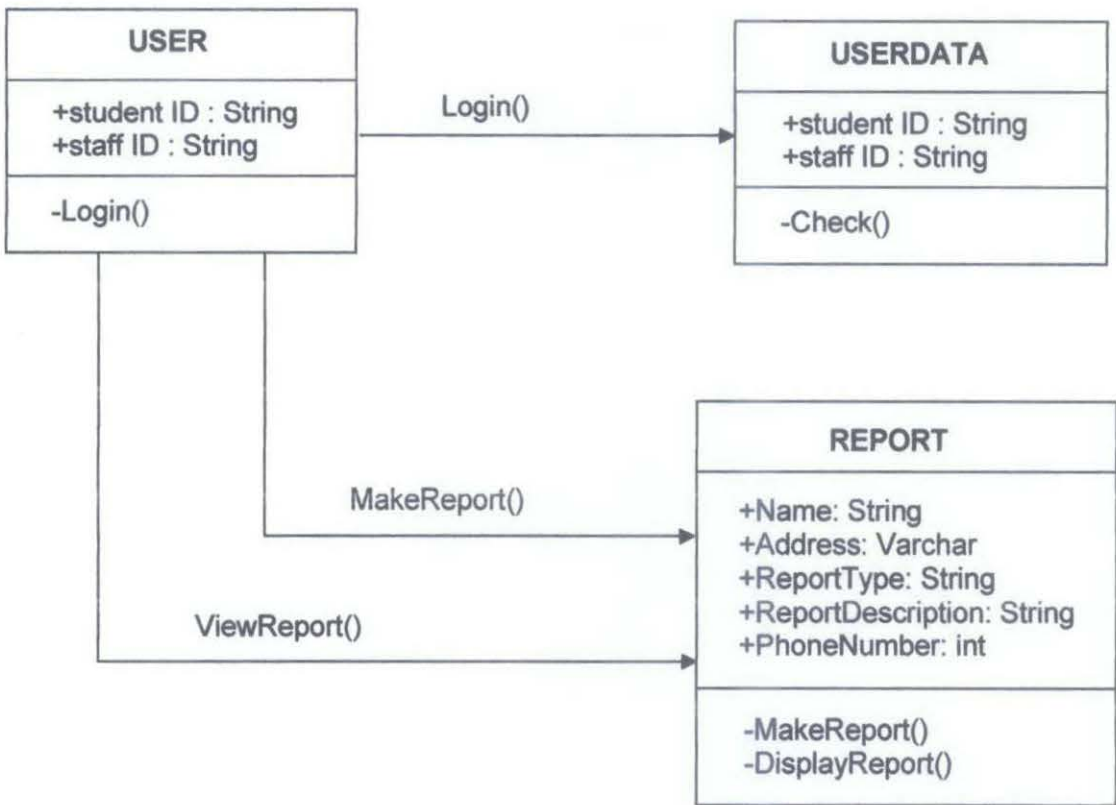


Figure 11: Class Diagram

4.6 Survey Results

A short survey regarding this project was launched to gather feedback from the potential users of the system. The survey was launched online at,

(http://www.kwiksurveys.com?s=HHHJHN_b023eb74). Until 17/10/2010, around 30 people had answered the survey. The results of the survey are as follow:

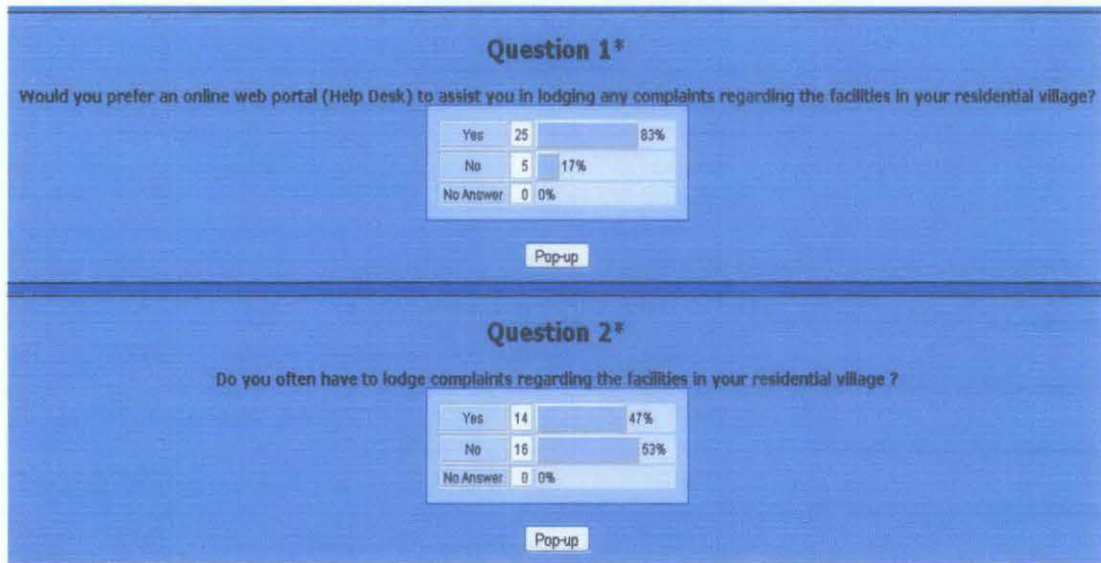


Figure 12: Survey Results

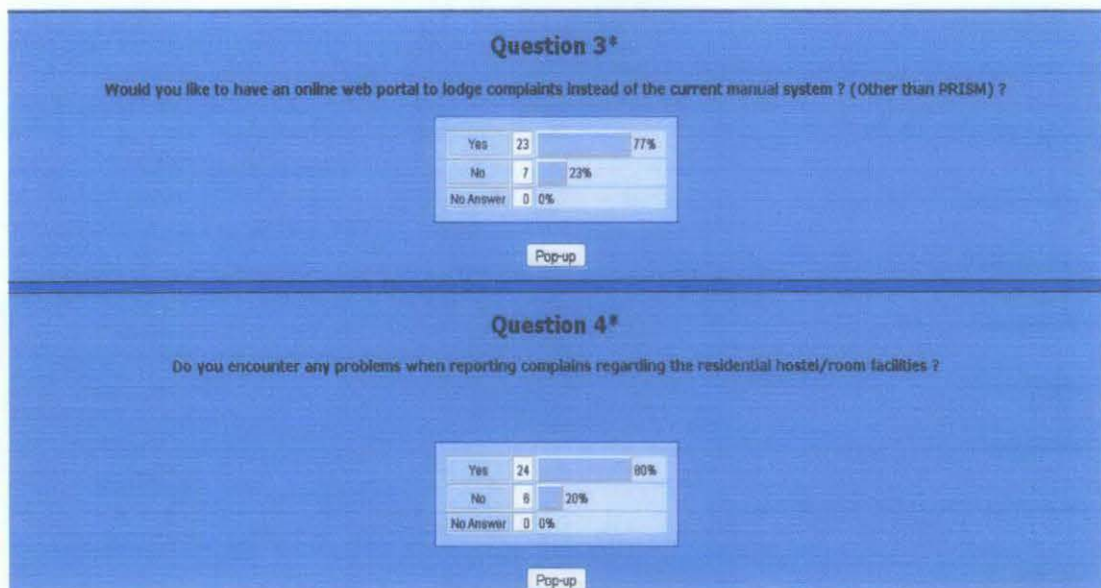


Figure 13: Survey Results

Based on the results above, from the 30 respondents who took the online survey, 83% of them would prefer an online web portal to assist them in lodging complaints regarding facilities in residential villages, while 80% have encountered problems when reporting complains manually. 77% of the respondents would prefer an online help desk portal compared to the current manual system to lodge complaints regarding the facilities in the residential villages.

4.7 System Prototype

Currently, for online help desk portal for the residential villages in the campus, I have completed the design and implementation of the prototype system for the XHTML part, PHP, and also the mySQL database. The tools, techniques and methodology that have been identified in this report has been used in developing the system, I am also currently executing phase by phase testing on my system from time to time as it is being developed to check on any defects. The system interface and functions will be described in detail with screenshots below.

4.7.1 Interface



Figure 14: User/Admin Login Page

The user or admin login page is being described as Figure 14. This is the interface where the user will enter his/her ID, followed by a password to be logged into the system and proceed accordingly.



Figure 15: The user homepage of the System

Once the user has logged into the system, they will be directed to a homepage as depicted in Figure 15. This will be the homepage for the user where he/she will be able to access the system and use its functions.

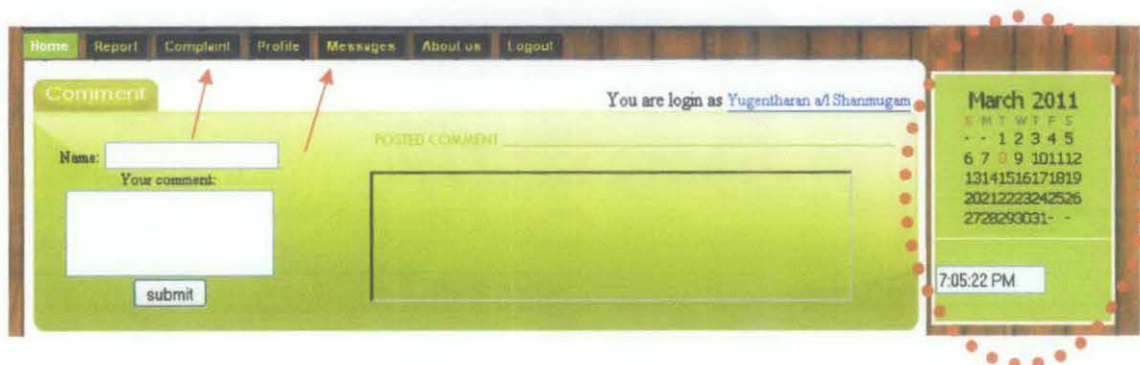


Figure 16: Add on's in the system

Certain features have been added to the system while the development such as shown in Figure 16, which is a calendar, live clock, a feature for the user to update his/her information or photo which is called “Profile” and also a feature for users of the system to send private messages to one another (“Messages”).

The screenshot shows a web interface with a navigation menu at the top containing 'Home', 'Report', 'Complaint', 'Profile', 'Messages', 'About us', and 'Logout'. The 'Report' menu item is highlighted. Below the menu is a 'Report Form' with the following fields:

Report Form	
Name: Yugentharan a/l Shanmugam	ID Number: I1 0051
Village: <input type="text"/>	Block: <input type="text"/>
Level: <input type="text"/>	House: <input type="text"/>
Room: <input type="text"/>	Contact Number: <input type="text"/>

Complaint Type(select only one):

- Electrical Appliance
- Piping and Leakage
- Door knob
- Broken Furniture

Please briefly describe the damage or broken in the text box below.

At the bottom left, there is a logo and the text: 'TELL US ABOUT YOUR PROBLEM / ROOMMATE'S REPORT FORM'.

Figure 17: Report Form

The online report form that will be filled in by the user can be seen in Figure 17. The report form contains all information about the user such as his/her name, ID number, residential village address and a brief description about the maintenance problem being faced by the student. The user has to fill in all the required details and click on the “Submit” button at the bottom of the form as shown in Figure 17.

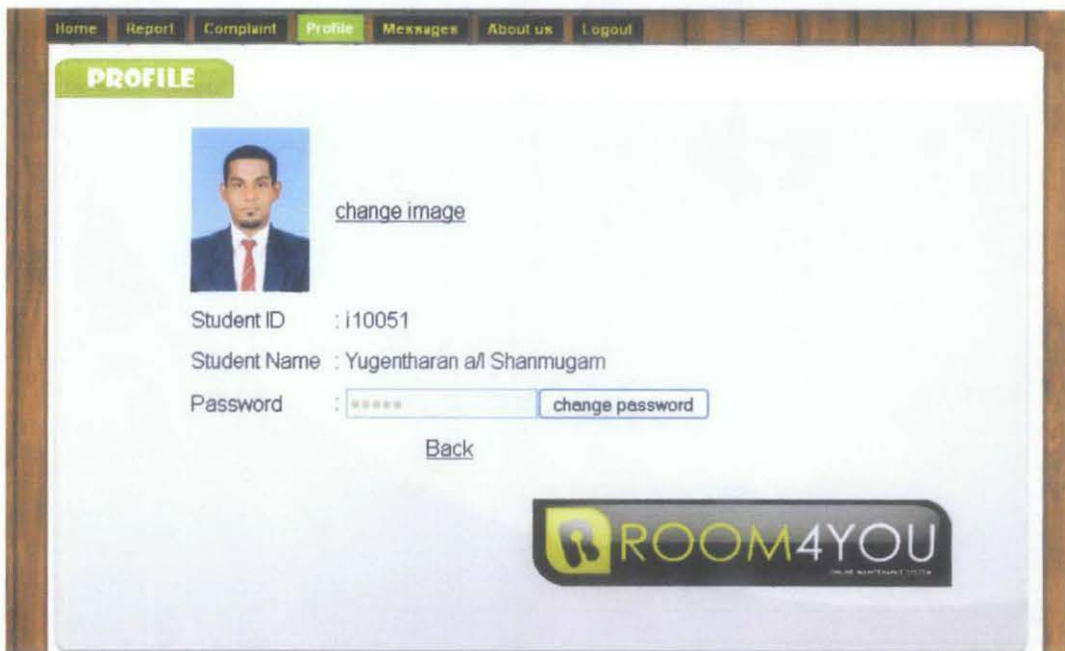


Figure 18: The User Profile

This user profile feature enables the user to change their picture by uploading an image of them into the system. The user can also change his/her password if necessary after their login into this system.



Figure 19: Messaging

This function allows the user to send messages to other users of the system. The messages will be displayed when the user logs in into the system.



Figure 20: Admin Control Panel

Figure 20 shows us the Admin Control Panel for the system. The admin panel consists of a 5 features which is:

1. View existing users of the system

This enables the admin to vie the number of users currently registered in the system.

2. View reports that have been submitted

The admin is able to view all the reports that have been submitted by the users regarding the maintenance of facilities in residential villages in campus

3. View messages that have been sent in the system

All the messages that have been sent between the users in the system can be viewed by the admin. This ensures that the admin will be able to monitor the activity of the users in the system and avoid any inappropriate mischief or foul language by the users.

4. View all user comments in the system

This feature enables the admin to also monitor all the comments that have been posted in the system.

5. Register new users in the system.

The admin will be able to register new users into the system by using this feature. An ID and password will be created for the user for their first time login into the system. The user can personally change their password after logging into the system to enhance their account security and ensure that it is not being hacked by others.

4.8 Future Work

For the future system development, I will try to use incorporate this current system into the Universiti Teknologi Petronas student portal which is known as the PRISM (<https://studentportal.utp-prism.my/studentportal/StudentLogin.aspx>). This will enable the system to be online in the internet and be accessible to all students of University teknologi Petronas. This is because currently, this system is a standalone system which runs on the Apache Web server. I also intend to develop the unit testing guideline and execute the unit testing process on my project accordingly. One of my classmates will be hired as the software tester for my final year project and he will responsible to develop the test cases and execute it. I also intend to expand my project to not only serve the residential villages but also other campus facilities in this university such as the academic complexes and also sports facilities.

CHAPTER 5

CONCLUSION

The final outcome of the project is able to adhere to the objectives which are:

- To develop an online help desk portal for the residential villages in the campus which can be accessed from anywhere that has an internet connection and a working internet browser.

Besides that, the problem statement, the objectives and even the design goals have been identified earlier so that the system can be developed smoothly and successfully. Moreover the project development schedule had been drafted and followed for this project so that; the project can be completed on time in the given timeframe within the two study semesters. The project schedule can be seen at the appendices section attached in this dissertation report. In addition, diagrams have also been used to map the system workflow.

All the essential and main functions of the system have been developed successfully. Currently the system is being tested from time to time while developing it to ensure any defects are dealt with accordingly. In addition, the system planning and development has adhered to all the stated objectives, methodology and also tools and techniques to ensure that the system meets its objectives in the end of the development stage.

This project is being forecasted to be very beneficial to the management of Universiti Teknologi Petronas, Residential College Support Unit and the students in the university living on campus residential villages since its usability, reliability and security can attract more users to view and use the portal, thus prompting better services regarding

maintenance in the campus residential villages. In the future, hopefully many other technologies can be implemented in the portal such as the enabling the system to send short messaging services (SMS) to the user once their report has been attended to and fixed.

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APPENDICES

APPENDIX A

Task	Start Date	End Date	Milestone	W1	W2	W3	W4	W5	W6	W7	MID-SEMESTER BREAK							W8	W9	W10	W11	W12	W13	W14	
STAGE 1 - Planning																									
1.1 - Topic Selection and Proposal Preparation	25-Jul	6-Aug																							
1.2 - Submission of Proposal			10-Aug			*																			
1.3 - Identifying the Scope of Project	6-Aug	15-Aug																							
1.4 - Identifying the Project Methodology	11-Aug	17-Aug																							
1.5 - Submission of Preliminary Report			26-Aug					*																	
STAGE 2 - Analysis																									
2.1 - Gathering the Project Requirement	30-Aug	6-Sep																							
2.2 - Search Information and Researches	9-Sep	16-Sep																							
2.3 - Submission of Progress Report			22-Sep																						
2.4 - Identifying the System Function	24-Sep	1-Oct																							
2.5 - Designing the System Interface	2-Oct	16-Oct																							
2.6 - Submission of Interim Report																						*			
2.7 - Oral Presentation																								*	

Legend	
	Task Duration
	Task Overlapping
*	Milestone

Table 1: Gantt Chart and Milestone of the Project (Semester 1)

Task	Start Date	End Date	Milestone	W1	W2	W3	W4	W5	W6	W7	MID-SEMESTER BREAK	W8	W9	W10	W11	W12	W13	W14	
STAGE 3 - Design																			
3.1 - Developing the System Interface				■	■														
3.2 - Developing the System Function					■	■	■												
3.3 - Configuring Database for the System							*												
3.4 - Connection System with Database							■	■	■										
3.5 - Submission of Progress Report												*							
STAGE 4 - Testing																			
4.1 - Unit Testing													■	■					
4.2 - Pre-EDX Poster Exhibition															*				
4.3 - Testing the System													■	■	■				
4.4 - Submission of Dissertation Report (Soft Bound)																*			
4.5 - Oral Persentation (VIVA)																	*		
4.6 - Submission of Technical Paper																			*
4.7 - Submission of Project Dissertation (Hard Bound)																		*	

Legend	
■	Task Duration
■	Task Overlapping
*	Milestone

Table 2: Gantt Chart and Milestone of the Project (Semester 2)