INTERACTIVE HOSTEL MANAGEMENT SYSTEM

By

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Final Dissertation submitted in partial fulfillment of
the requirements for the
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CERTIFICATION OF APPROVAL

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Universiti Teknologi PETRONAS

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Approved:

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Project Supervisor

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UNIVERSITI TEKNOLOGI PETRONAS

TRONOH, PERAK

MAY 2011

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 or persons.

Aznin Bin Kamari

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Interactive Hostel Management System

ABSTRACT

The project is intended to come out with an interactive system that helps the students to perform the defect report to the Residential College (RC) unit and registering available room preferred in effective way. The current problem now is that the current system is not working properly because the RC unit does not provide sufficient information on the hostel layout and exposure on available room that can be booked and registered by the students. Thus the current system is done manually again in which then burdening the students especially students returning from industrial training and students wishing to change their current room which requiring them to propose a formal letter. Scope of study for the project involves the study area that targeting UTP students as the users which includes current students, new students and students returning from industrial training. Moreover, study is conducted towards designing the hostel layout using java and research on the UTP hostel management procedure. The project is implemented using waterfall model of system development life cycle as the project methodology consist of five phases which are planning, analysis by interview and questionnaires, designing, implement and testing. Based on the interview and questionnaires, it shows that there is a need to improve the current system. Thus, the Interactive Hostel Management System provides an interactive hostel layout to help students in UTP to select their preferable room and to ease finding the correct location to report any defect within the hostel.

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Chapter 1

Introduction

1.1 Background of study

Hostel management systems and their transaction are getting more complicated nowadays. According to Sharlin E. (2009), users usually prefer to choose to use the system that is interesting and easy to use. Designing a good hostel management is a very crucial in order to help the users do their hostel transaction such as registering hostel placement and report defect in interactive way. Sharlin E. (2009) also stated that interactive system will help the users to use the system easily with less effort in understanding the system once used the system and pleasing when using the system with graphical approach offered by the system.

Universiti Teknologi PETRONAS (UTP) has been selected as the experiment to develop an interactive hostel management system since most of the hostel management transactions are being done manually by the organization. This system is intended to help the Residential College (RC) Management in UTP in managing the hostel transactions for the students. Throughout the project development, issues related to the hostel management and their transaction gathered and analyzed to come up a good interaction system that solve most issues arose from the current hostel management system.

From the data gathered, research towards the development of the interactive system also carried out in order to come up with a system that is acceptable by the user and the organization in which this method will at the same time solve the current issues face by the user and the organization.

Thus, at the end of the system development, an interactive hostel management system is developed with layout offered in order for the users to get better visualization in identifying the correct location situated in the hostel in doing the transactions such as report defect and registering available room in effective way to the Residential College unit.

1.2 Problem statement

Students can do the hostel transaction by logging in to the UTP student portal in which there is a link embedded in the portal for the user to do the defect report and register their hostel placement (refer Figure 1.1). Based on the user experiencing the current system provided by the Residential College unit, the current system embedded in the UTP student portal is not working properly. The system provides insufficient information on the hostel layout in order for the user to tour around to preferable room to do the transaction especially registering hostel placement and defect report.

Furthermore, the current system failed to provide the information and exposure of the available room that can be booked or registered by the students (refer Figure 1.2). Thus, this problem ignites cases of students mistakenly registered the rooms that has already occupied by other students which then makes the current system less convenience to use.

The current system also is designed for the current student to update their hostel placement. This system is not suitable to be used by the new students and students returning from industrial training in which their current hostel placement in the database is empty. Moreover, this system also cannot be used by the students who wish to change their current room. All of them need to propose a formal letter in order to get the approval to change the current room or to get the hostel placement in which this method is quite complicated and time consuming.

Same goes to defect management in which it is done manually by the RC unit and the students who wish to report defect are required to go to the RC office during office hour to fill a form. There is a tab for the students to register defect in that portal (refer Figure 1.3), but the RC unit prefers the students to come to the RC office to report any defect in which then make the tab in the portal become ineffective.
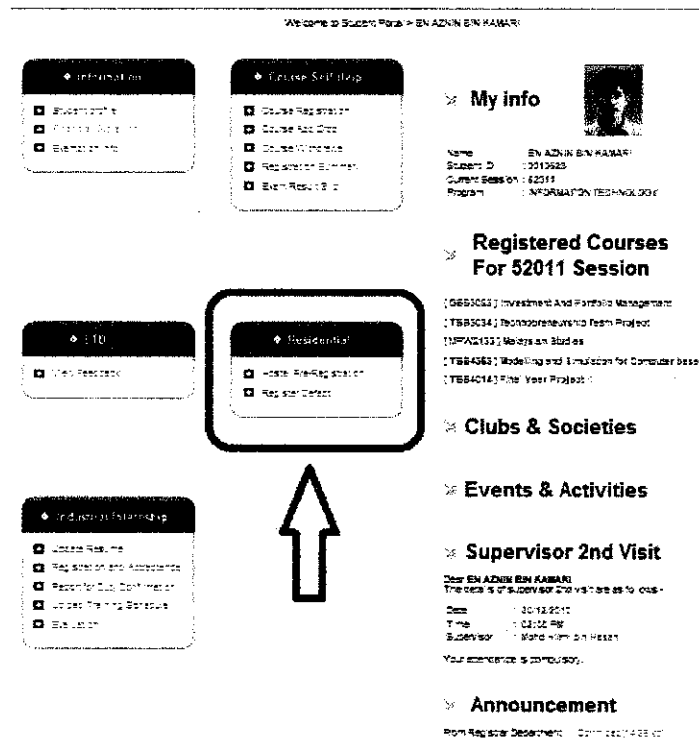
Figure 1.1: Current system in the student portal
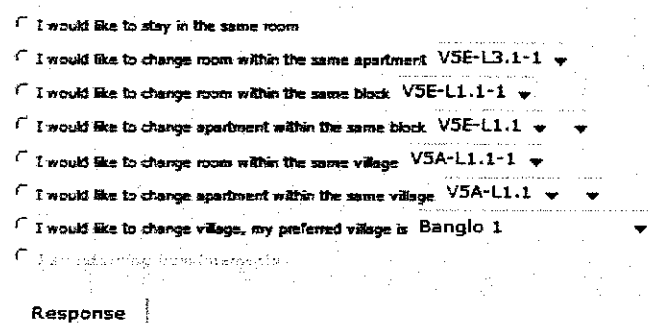
Figure 1.2: Hostel pre-registration window
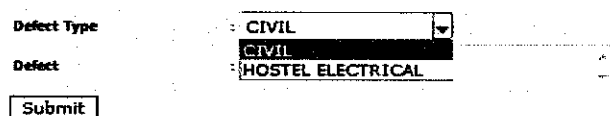
Figure 1.3: Register defect form

1.3 Project Significant

Thus, by having a new interactive hostel management system that consist of layout that displays the location of the rooms, every student including students who are returning from industrial training and current students wishing to change their current room can use the system. The system helps the students to perform the defect report to the RC unit and register available room preferred in effective way by visualizing the graphical materials provided by the system when using the system. This will reduce the effort taken by the students to deal with the accommodation matters and their transaction.

1.4 Objectives

The objectives of developing Interactive Hostel Management are as follows:

- To design UTP hostel layout system and interface that can be easily used by the students to register hostel placement and report defect.
- To develop a system that is accessible anywhere using java language.
- To allow interaction and communication among students staying at the hostels.

1.5 Scope of study

The project involves the study area:

- Target users are UTP students including current students, new students and students returning from industrial training.
- Layout design using java and research on UTP hostel management procedure.

This system development of interactive hostel management system will cover many aspects of study with the main focus to design a layout that consist of layout that describes the location of the rooms and displays anything around and near the rooms which requires deep understanding on human-computer interaction. Another research is about programming tool by highlighting on the tool functions and abilities that can be used to develop an interactive layout interface with the help of software engineering knowledge.

Chapter 2

Literature Review

Research shows that, most universities' hostel management system including UTP only provide an online form to record the students' hostel registration or to report any defect. Thus the conventional hostel management systems are moderately unexciting since most universities students are teenagers who enjoy working and using the system that is simple but fun and interesting to use. The idea of the project is to develop a system which focused on the ease of use and easy to learn by the user by studying the interaction between human and computer which then can minimize and reduce problems and constraints faced by the users that has been suggested that has been stated in previous chapter.

2.1 Hostel Registration Policy and Report Defect Procedure

Residential College (RC) Management is an established department that fall under Universiti Teknologi PETRONAS (UTP) management in which responsible in handling the placement of all the students in the residential village especially to the new students and also helping the management in solving related problems related to residential village. (Source: http://utprcsu.blogspot.com/p/about-utp-rcsu.html)

There are three main residential in UTP which are Village 3 and Village 4 which contain five 4-level blocks each and also Village 5 which contains twelve 5-level blocks. Each level of the block consists of four houses each level and six rooms each house. Each room can be occupied by maximum of two students.

Figure 2.1: UTP Residential

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Hostel registration is very important procedure in UTP in order for the students to get the accommodation and placement to stay for the whole semester. So, every beginning of the new semester, students are required to update and register their hostel placement in order for the residential unit to update the student status in UTP whether they are going for the industrial training or going to be graduated on the upcoming semester.

Students can update their hostel placement by logging in to UTP student portal website using their own account. Students requesting to change their current room need to propose a formal letter to the Residential College officer for approval. The student must ensure that the requested room is available or else the officer will disapprove the application.

New students' hostel placements are arranged randomly by the UTP Residential College unit. Students returning from industrial training need to propose a formal letter before the new semester started in order for the UTP Residential College unit to arrange their hostel placement.

According to the policy stated by the residential college unit, students can choose their preferable room. Since most UTP students are Malay, there is a policy stated that at least two other races or international students occupied at each house to promote the student's diversification.

Once the students confirmed their placement by the residential unit, they are responsible to take of their own room. Any defect existed must be reported directly to the residential unit office by fulfilling form provided. The process usually takes about a week to be solved. Damages with the intention will cause the students to pay certain amount to the university.

2.2 Information Visualization

There is a need to provide a system to the user in order for the user to be notified of the room availability and pick the preferable room to stay. Hostel layout design is one of the ways to help the user to identify the room location to book.

Designing hostel layout in the system requires the understanding of information visualization because visualization approach helps the user in doing the transaction of the system more effective.

According to Samuel J (2008), Information visualization is the interdisciplinary study of the visual representation of large-scale collections of non-numerical information. Information visualization presumes that visual representations and interaction techniques take advantage of the human eye's broad bandwidth pathway into the mind to allow users to see, explore, and understand large amounts of information at once. He added that, information visualization focused on the creation of approaches for conveying abstract information in intuitive ways.

According to Sharlin E. (2009), Information visualization represents data or concepts graphically and helps people construct cognitive maps of the mind, such as mental representations of the information space. To optimize the system usability from human-computer interaction aspect is by going further research in human visualization approach when designing the interface. The interface has to be beyond users' perceptual capabilities and make more effective use of it.
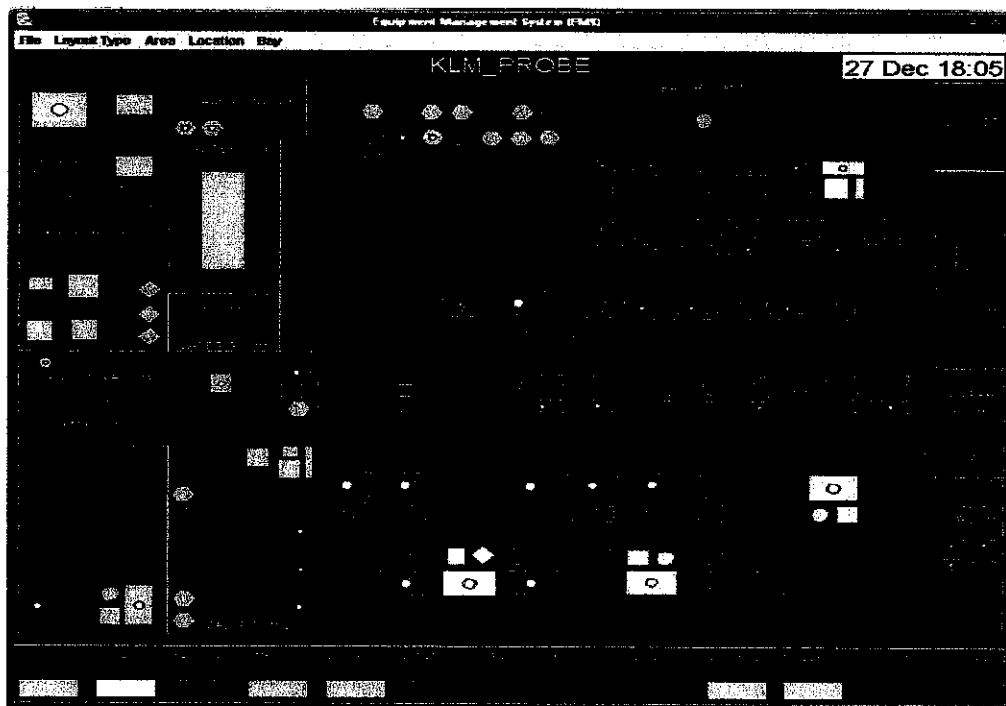
Figure 2.2: Sample of existing system that using visualization approach to determine the location

Visualizations also can increase the memory usage and processing resources available to the user since humans are highly attracted to images and visual information. Thus, the users can enhance the user's ability to remember and guessing what will happen next in the system. Moreover, they can facilitate the monitoring of change in large numbers of potential events that might occur in the system.

A visual representation can communicate some kinds of information much more rapidly and effectively than any other method. So, the layout design of the system is focused on how the users visualize the place of the room in the blocks by providing suitable details such as block label and stating anything near to the block in order to help users finding the correct location to register available room or to report defect.

2.3 Interaction in Interactive System

The word interactive is found everywhere these days. Samuel J (2008) defined interaction as an approach to enhancing the communication and social abilities of people with deep intellectual disabilities using principles from care give-infant interaction. Thus, this system is intended to develop an interactive system so that the user can feel interesting to use the system.

Interactive definition is broad. Samuel J (2008) stated that interactive system also can be defined as interaction between the users to the other users. To develop an interactive system, communication towards other users also need to be considered.

Throughout the process of interaction design, the author must be aware of key aspects in their designs that influence emotional responses in target users. The need for products to convey positive emotions and avoid negative ones is critical to product success. These aspects include positive, negative, motivational, learning, creative, social and persuasive influences. One method that can help convey such aspects is the use of expressive interfaces.

In software, for example, the use of dynamic icons, animations and sound can help communicate a state of operation, creating a sense of interactivity and feedback. Interface aspects such as fonts, colour pallet, and graphical layouts can also

influence an interface's perceived effectiveness. Studies have shown that affective aspects can affect a user's perception of usability.

Figure 2.3: Sample of non-interactive system
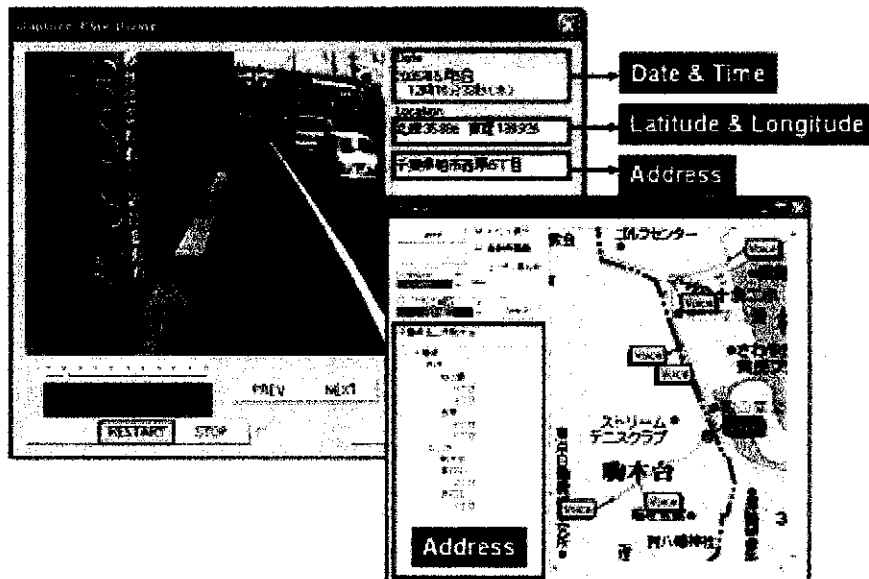
Figure 2.4: Sample of existing interactive system

2.4 Enhancement of Communication Aspects in Interactive System

Communication is really important in daily life. Communication helps human beings to connect with each other as individuals and as independent groups.

Communication is needed in order to express the needs and to share other important information so that human can work and function together in a sufficient way.

With the latest technology, distance is not being the factor that can hinder the effective communication since anyone can be connected online through a medium or software. So now, they can communicate wherever they are without meeting each other at one place which requires commitment of time and cost.

There is a need to enhance the current system by adding feature to allow communication among users who use the system. This is to help the students to communicate with other student easily without needing them to set the time and place to meet each other personally. Furthermore, from this module, they can share or ask any registered students about anything related to studies or information whether ask generally to all just like a forum or send personal message directly to selected student. So, this will make the system useful medium of communication in the residential and makes the system become more interactive compared to the current system.

2.5 Graphical User Interface (GUI)

A graphical user interface (GUI) is a type of user interface item that allows people to interact with programs in more ways than typing such as computers. A GUI offers graphical icons, and visual indicators, as opposed to text-based interfaces, typed command labels or text navigation to fully represent the information and actions available to a user. The actions are usually performed through direct manipulation of the graphical elements.

There are several principles need to be considered when deal with GUI. Refer to the list below:

- Layout

  The interface should be series of areas on the screen that are used consistency for different purposes.

- Content Awareness

  Users should always be aware of where of where they are in the system and what information is being displayed.

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- Aesthetic

  Interfaces should functional and inviting to users through careful use of white space, colours, and fonts. There is often a trade off between including enough white space to make the interface look pleasing without losing so much space that important information does not fit on the screen.

- User Experience

  Although ease of use and ease of learning often lead to similar design decisions, there is sometimes a trade off between the two. Novice users or infrequent users of software will prefer ease of learning, whereas frequent users will prefer ease of use.

- Consistency

  Consistency in interface design enables users to predict what will happen before they perform a function. It is the one of the important elements in ease of learning, ease of use, and aesthetic.

- Less User Mobility

  The interface should be simple to use. Most designers plan on having no more than three mouse clicks from the starting menu until users perform work.

2.6 Portability of the System

The last aspect to consider is portability. Robert F (2006) said that, "a portable system is one can be run a different computer or operating system with little or no modification". Thus a portable system should not only be machine-independent but should isolate its user as much as possible from the operating system as well.

Researches on the evaluation of statistical software generally consider portability to be an important and desirable feature of any system or software. Their point of view seems valid because unless the system designer strives to achieve portability, a substantial amount of human effort will be wasted in recording or converting the same system to run under machines and compilers of various different manufacturers.

So, based on this research, Java is the suitable language to develop the system because it can be run on any platform including Windows and Linux and using internet based programming in which the system can be accessed anywhere.

Netbeans IDE is selected as the System Development Kit (SDK) as it is an open-source integrated development environment that supports development of all Java application types. All the functions of the IDE are provided by modules.

NetBeans contains all the modules needed for Java development in a single download, allowing the developer to start working immediately. The Java platform also provides support for creating a graphical user interface (GUI) for the developer desktop applications. Several layout managers help the developer specify the position and size of GUI components.

The noteworthy feature offered by Netbeans is the ability to create Swing GUI quickly (refer Figure 2.1). Swing is Java's library of visual programs. Swing can be used for popups, or containing a full-screen game.

In Netbeans, creating a JFrame which is a frame for a program which can contain components such as buttons is really simple. The developer can right clicking the package that the developer wish to insert it into and thenk clicking "New > JFrame Form". The developer will see a palette on the right. The developer can simply drag and drop from the palette into the window and the source code is automatically generated.
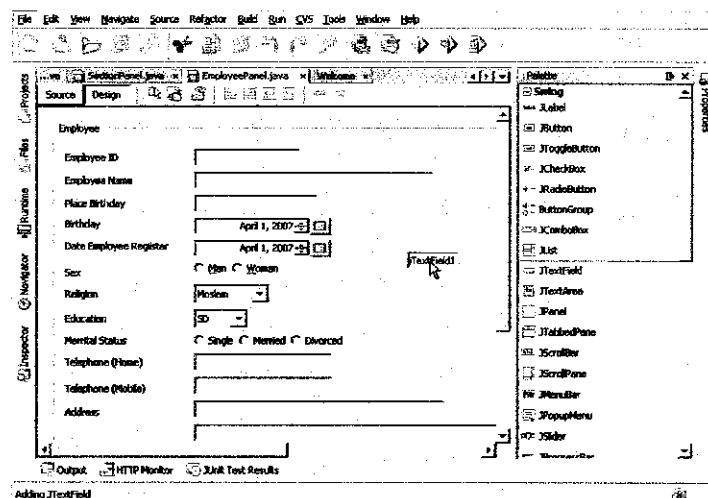
Figure 2.5: Netbeans window

Chapter 3

Methodology

3.1 Research Methodology

The 'Interactive Hostel Management System' is implemented using waterfall model of system development life cycle as the project methodology. This methodology is selected because of its advantage which allows for departmentalization and managerial control. In "The Waterfall" approach, the whole process of software development is divided into separate process phases. The phases in Waterfall model are: Planning, Analysis, Design, Implementation and Testing.
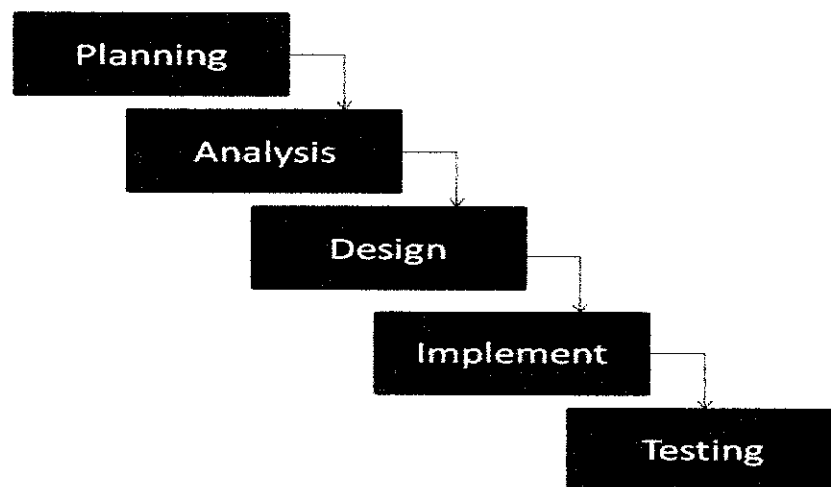
Figure 3.1: Waterfall Model

3.2 Project Activities

3.2.1 Planning phase

The overall project is intended to come out with an interactive system that helps the students to perform the report defect to the RC and registering preferable room that is available in effective way. The system is planned to make the users easy to learn and understand the system by exposing visual approach through the hostel layout from the system.

At the beginning of the planning phase, the first thing that has been discussed is the tool of programming that will be used. Based on the author's expertise, skills he acquired and system compatibility, the author prefers to choose Java programming language as the main programming tool for this project. Apart of that, the time frame of project also has been decided in which the project will be completed within twenty eight weeks with some deliverables need to be considered as well.

3.2.2 Analysis phase

All possible requirements about what areas need to be focused and highlighted in order to obtain and gather the data and information that might contribute and help the project development flow of the system to be developed are captured in this phase. There are many ways to gather information in the analysis phase. The two ways are, conducting interview and survey user preference in which indirectly analyse the study of human interaction towards the system.

Interviewing people is one of the ways to gather information. In this research project, interview session with the representative of residential unit is conducted in order to know in details their current management, problems and issues that they faced. The examples of frequent interview questions that have been asked are:

- What is the problem with the current system and management?
- What is the limitation of current system and management?
- What areas need to be improved?
- How to increase the efficiency and effectiveness of the current system and management?
- What areas need to be focused in the project development?
- What kind of interface design that the user expected?

The next analysis is through survey. Survey could be in many forms and the easiest and precise way would be in questionnaires. Those questionnaires are about current system being provided by the residential unit and students expectations towards the new system. The survey questions are discussed in the Result and Discussion section.

3.2.3 Design phase

On the design phase, the actual database or file structure, user interface, system input and outputs is designed. The design is about programming a simple prototype. The purpose of having the prototype is to give the user about the ideas and opinions of further development since this project is based on from sketch. Thus, by developing the prototype, the speed of development of the project may be boost in way of generating of innovation about how the final project outcome will be. The system design specifications also serve as input for the next phase of the model.

3.2.4 Implementation Phase

Upon receiving system design documents which are system prototype, the work is divided in modules or units and actual coding is started. The system is first developed in small programs called units, which are integrated in the next phase. Each unit is developed and tested for its functionality; this is referred to as Unit Testing. Unit testing mainly verifies if the modules or units meet their specifications. After that, these units are integrated into a complete system during Integration phase and tested to check if all modules or units coordinate between each other and the system as a whole behaves as per the specifications.

3.2.5 Testing Phase

Testing phase comes next after the system has been developed. For the testing purpose, the system would be tested by UTP students perform user acceptance testing (UAT). For the best result, the system will be tested to as many students as possible. Feedback and survey from the students and the representative will be collected to know the quality of the system produced. Furthermore, any response can be taken into consideration to improve the system in future.

3.3 Project Timeline

This project is estimated to be completed within two semesters, January Semester and May Semester. With reference to the Gantt chart in **Appendix A,** Semester 1 will mostly cover on research and paperwork on developing the system. During that

semester, all data and requirements are gathered to which will then be implemented in Semester 2. Semester 2 is focusing more on developing the Interactive Hostel Management System and apply it in real-time. This is where designing, programming and implementation take place.

3.4 Tools required

Software

- Netbeans IDE 7.1 (main development tool)

  Tool to program the system and to compile and integrate the code in order to get the output which is the user interface and any transaction involve.

- MySQL

  MySQL is selected as a database tool because it is a free-open-source software that provides relational database management system which runs as a server that can be accessed by multiple users to a number of databases.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Results

4.1.1 Result from Questionnaires Regarding the Current System

Nine questions have been asked to 38 students. They have responded the survey. Following are the questions of the survey (agree/neutral/disagree) with analyzed response:

- Have you face any problem regarding hostel registration or reporting any defect in your residential college?
  (65.8% agreed)

- Are you satisfied with current system provided by the RC unit?
  (44.7% disagreed)

- Is the current system is useful to every student including new students and students who are returning from industrial training?
  (44.7% disagreed)

- Are you staying at your preferable room?
  (42.1% disagreed)

- Do you know whether your preferable room to be booked is still available?
  (65.8% disagreed)

- Do you have the time to go to the residential office to deal with the RC staff regarding hostel registration and report defect during office hour?
  (56.8 % disagreed)

- Is it effective to just rely on the system without dealing with the RC staffs at the RC office?

  (40.5 % agreed)

- Is there a need to improve the current system to simplify the process of hostel registration and defect reporting?

  (86.8% agreed)

- Is it good to put your basic details in the system that can be seen by others to keep track of where you are staying?

  (57.9% agreed)

Figure 4.1: Overall Survey Chart

In conclusion, 87% of students agreed that there is a need to improve the current system by stating the room availability in the system, providing sufficient information on location of the room in order to ease in reporting defect and offer new enhancement which helps them communicating with other users.

4.1.2 Comparison between Current System and Expected System

Following are comparison between current system and expected system:

Current System	Expected System
Insufficient exposure on hostels layout to the users.	Expose the hostel layout and location details.
Stated room's number only.	Stated room's number with the details of current students stayed at the room.
Room availability is not exposed.	Inform the room availability.
Only can be used by the current students to update their hostel placement.	Any students can use the system.
Need to propose a formal letter to apply hostel placement.	Hostel placement can be done in the system without proposing a formal letter.
Defect report is done manually.	The system includes defect report module.
Users cannot communicate among each other.	Users can communicate among each other.

Table 4.1: Comparison between Current System and Expected System

### 4.1.3 System Prototype

1) Login

The first interface that the user will view is login page. In order to use the system, the user must register their email to the administrator. Firstly, the system will require the user to enter their email and password for authentication to use the system. User needs to fulfil both email and password field in (refer Figure 4.2).

Figure 4.2: Email and Password required

If the email and password matched with the email and password stored in the database, the user can proceed to use the system.

When the user entered email that is not stored in the database means that the user is using unregistered email (refer Figure 4.3). To solve this problem, the user need communicate with the administrator in order to register the email and included to the database if they are entitled to use the system.
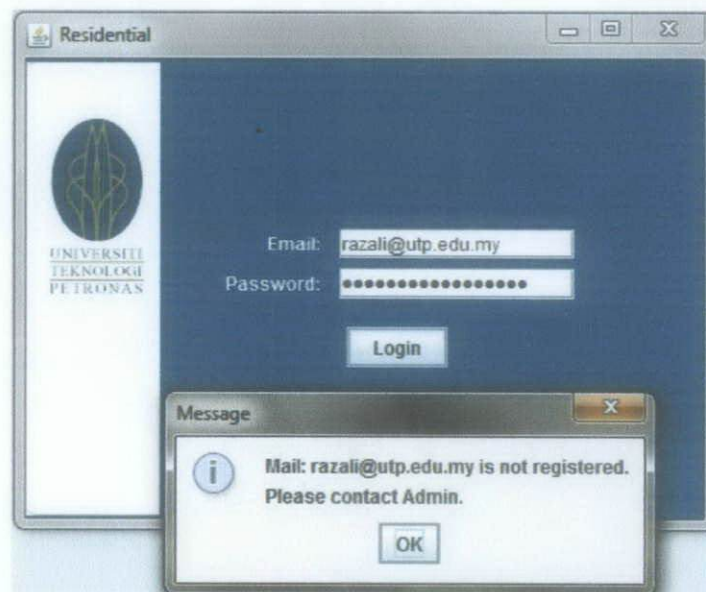
Figure 4.3: Login with unregistered email

Password entered by the user must be matched with the password of the email that stored in the database (refer Figure 4.4) for authentication purpose. Forgotten of the

password will require the user to reset the password by requesting from the system administrator.

Figure 4.4: Password should match with Email

Upon succeeding the Login session, user will be directly sent to the main page of the system (refer Figure 4.5). In this page, user will be notified on how many messages unread in his/her account. This page also enable the user report defect of his/her current room, search other user and select village.
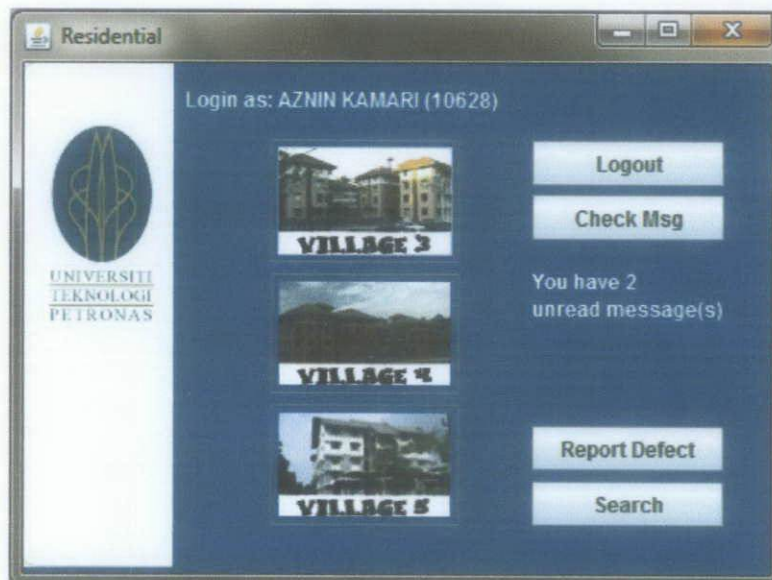
Figure 4.5: Main Window

2) Selecting Village, Block and Block Level

For village selection options, there are three selections of village which are village 3,

village 4 and village 5. This is the main window for the system.Each village has different layout. Figure 4.6, 4.7 and 4.8 show the layout window that represent the differences between the villages based on the user selection on the village selection button.
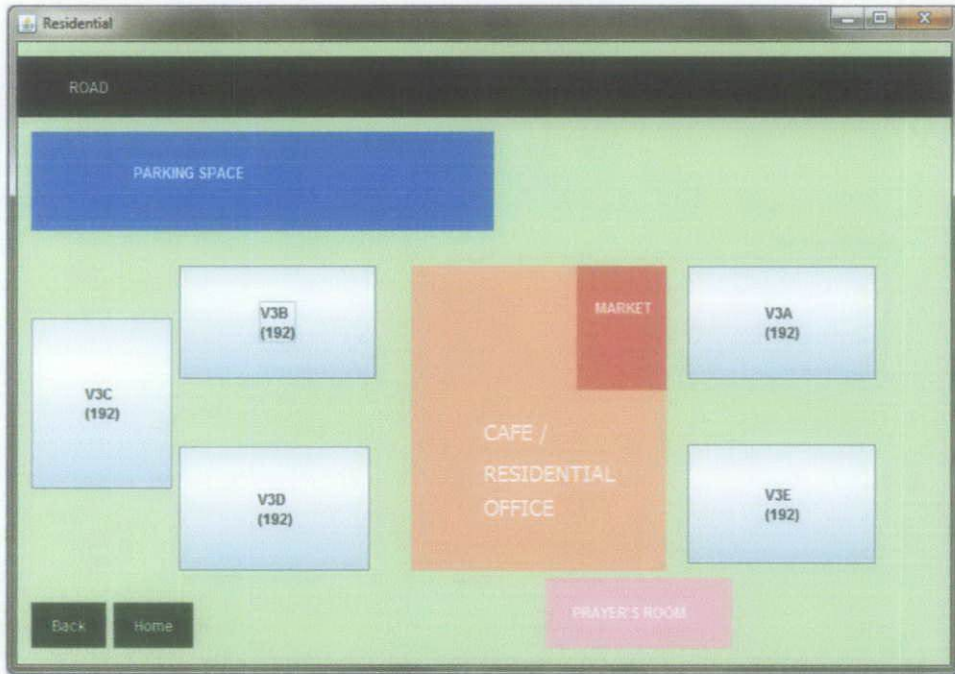
Figure 4.6: Village 3 Layout
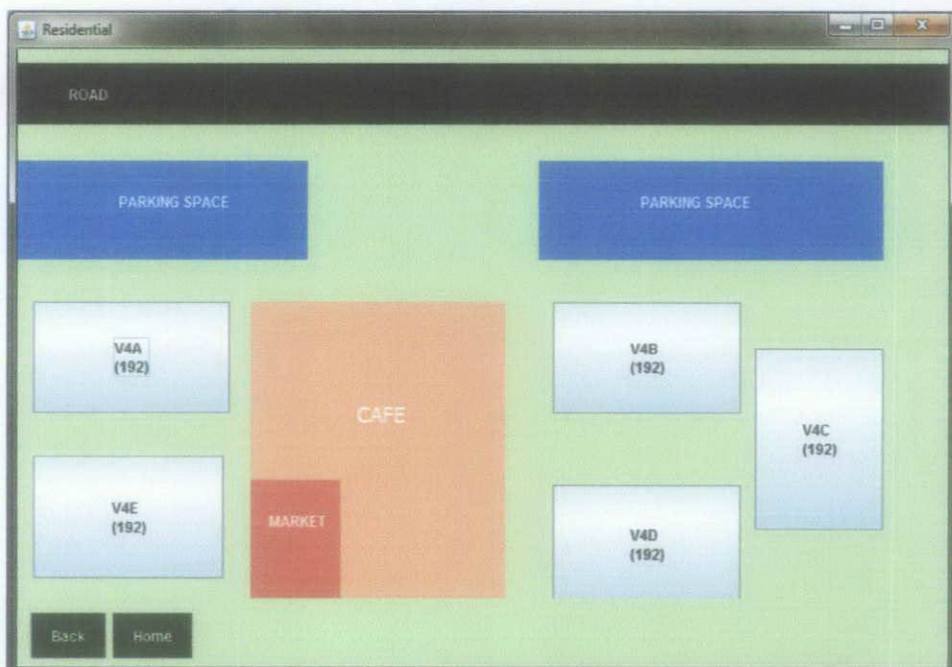
Figure 4.7: Village 4 Layout

Figure 4.8: Village 5 Layout

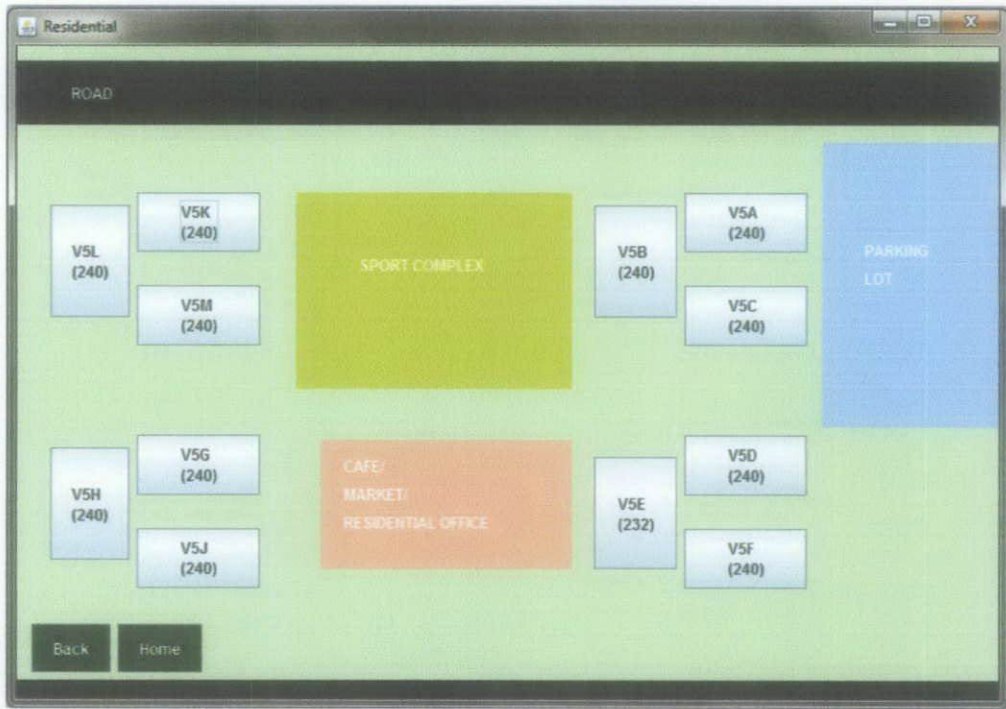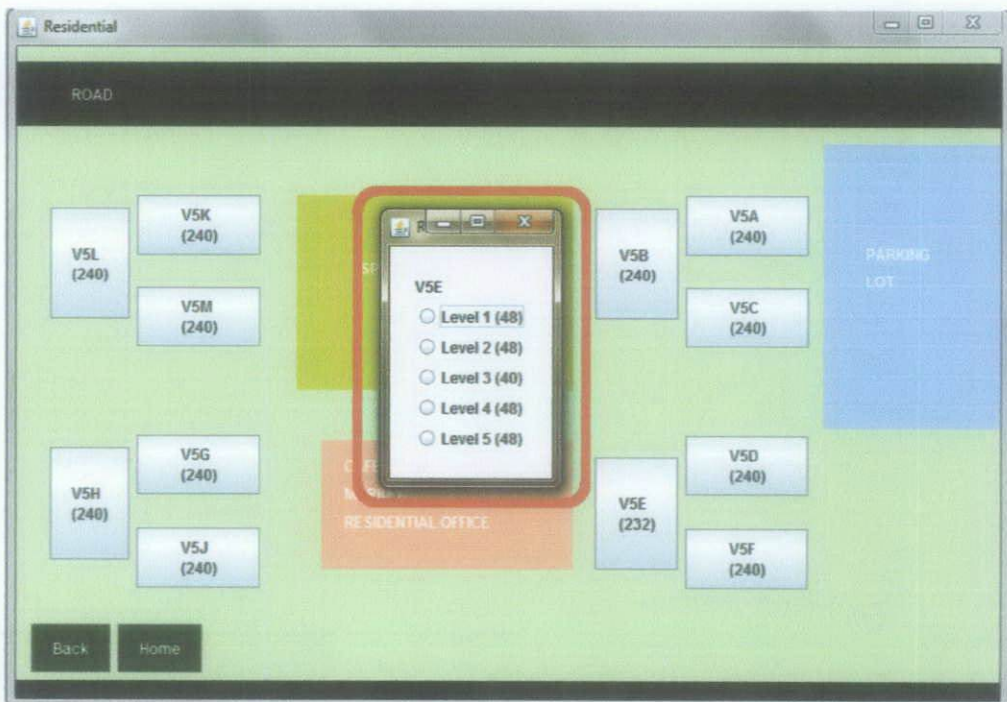In each Village Layout window, the user can choose preferable block by clicking the labeled block button. Then a dialog box will be appeared which prompting the user to select the level of the block chosen (refer Figure 4.9). Total available room indicated by numbers stated at the block and level label.

Figure 4.9: Level selection

All windows will be provided with home and back button for easier navigation for the user (refer Figure 4.10). Back button will send the user to the previous window opened. Home button will send the user to Village selection page which is the main window of the system (refer Figure 4.5).

Figure 4.10: Back and Home button

Once the user chose the level, the user will directly send to the house and room layout window based on the village and block selected (refer Figure 4.11). From this window, the user can check the person who is currently staying at the room, his/her roommate, send a message to the user that stayed at the current room, check room availability and report defect of the room selected. The panel for "Current Room Selected" will display the room address that user currently pick in order to show direction and to ensure the user pick the right room.
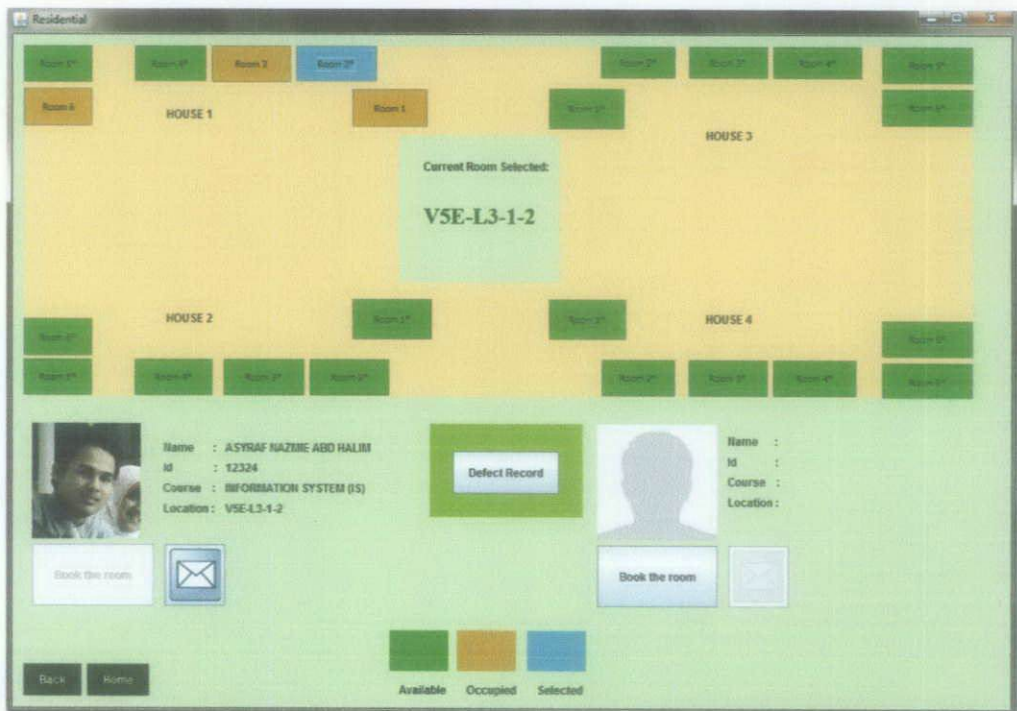
Figure 4.11: House/Room Layout

Based on the layout, the available room will be indicated with color on it (refer Figure 4.12). Green for available room, brown for occupied room and cyan for the room that the user currently pointing at. So this will help the user find the preferable room to book.
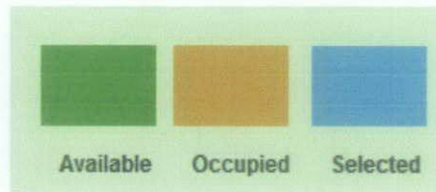
Figure 4.12: Indication of room availability

3) Room Details

Once the user clicked on the selected room button, the system will display the students' information that currently stayed at the room at the bottom of the window (refer Figure 4.13). Room availability can be identified if no student information is retrieved from the database based to the room selected. User can book the room placement by clicking on "Book the room" button. This window also will enable the user to send a message directly to the student who stayed at the room to know more about the room, asking permission to be a roommate, to inform anything related and so on.
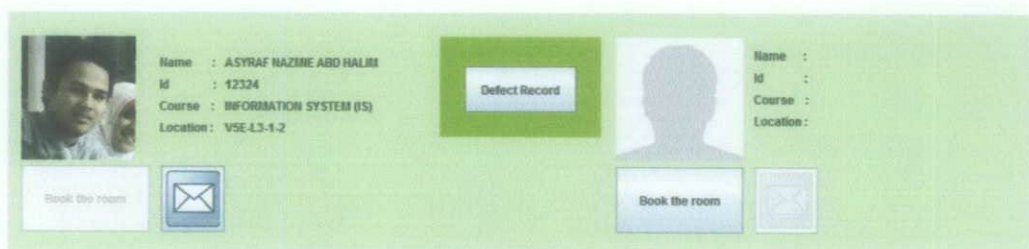
Figure 4.13: Details of Students stayed in the room

4) Defect Information of the Room

This system also provides user the ability to know the current defect of the room that is unsolved yet by the management. The user can simply select any preferable room and click 'Defect Record' in between the student details. The system is then popping out a window stating the defect record of the room (refer Figure 4.14).
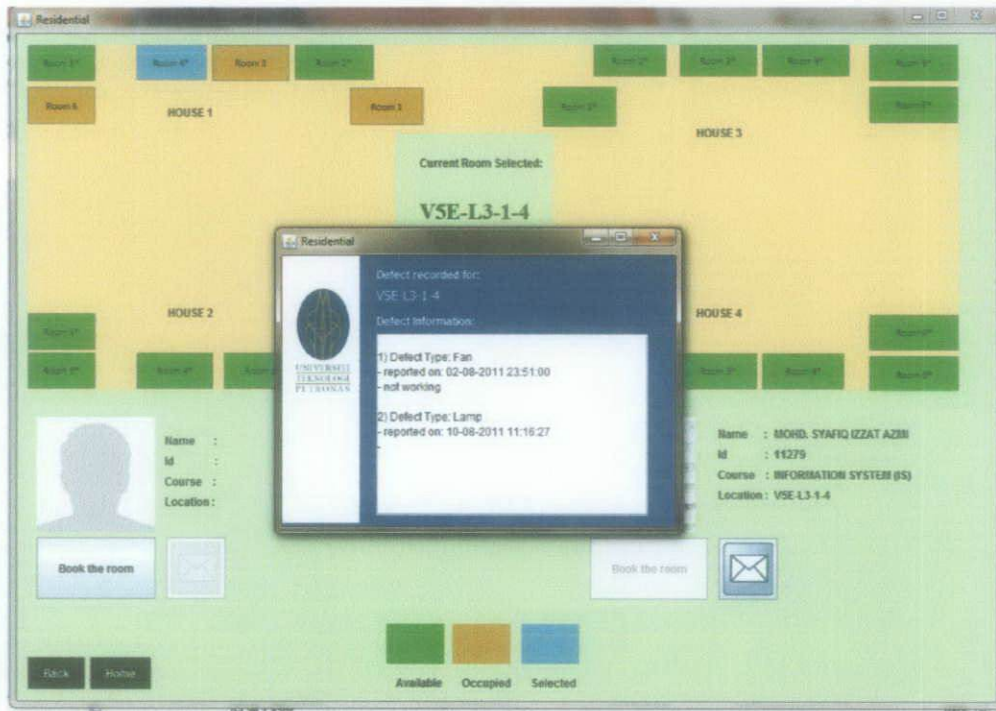
Figure 4.14: Defect Information of the room

5) Sending Message to other users

User also can send message to the other user in the room selected by clicking the mail icon and the following window will appear (refer Figure 4.15). From this window, user can send a message to the other user by writing the message at the message text area.
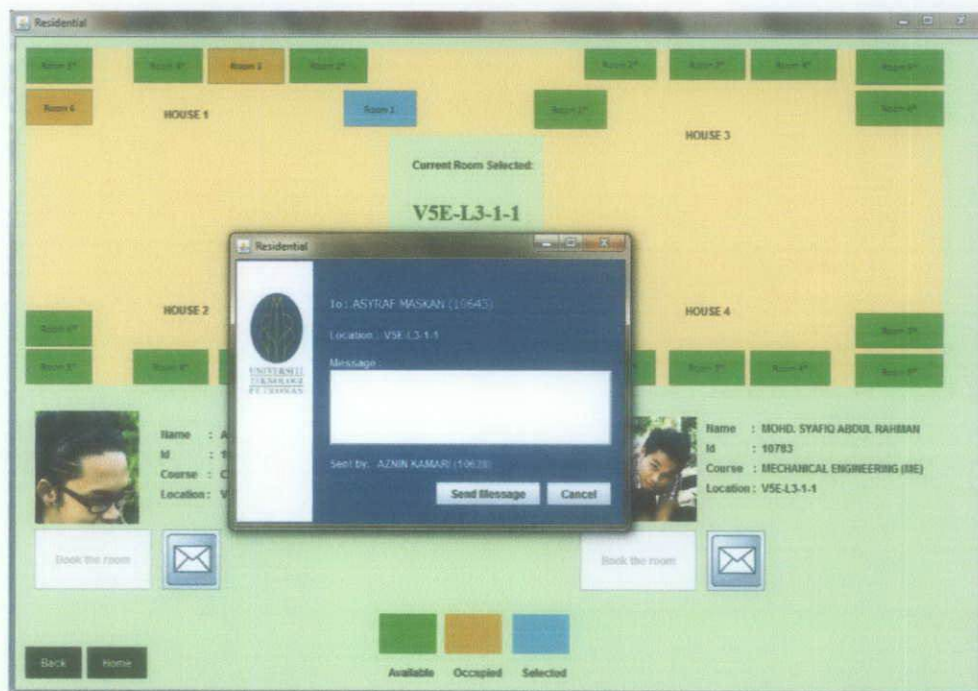
Figure 4.15: Sending message window

Upon clicking 'Send Message' button, the transaction will be processed and message window will appear (refer Figure 4.16) when the transaction succeeded. The 'Cancel' button will terminate the transaction and close the defect report window.
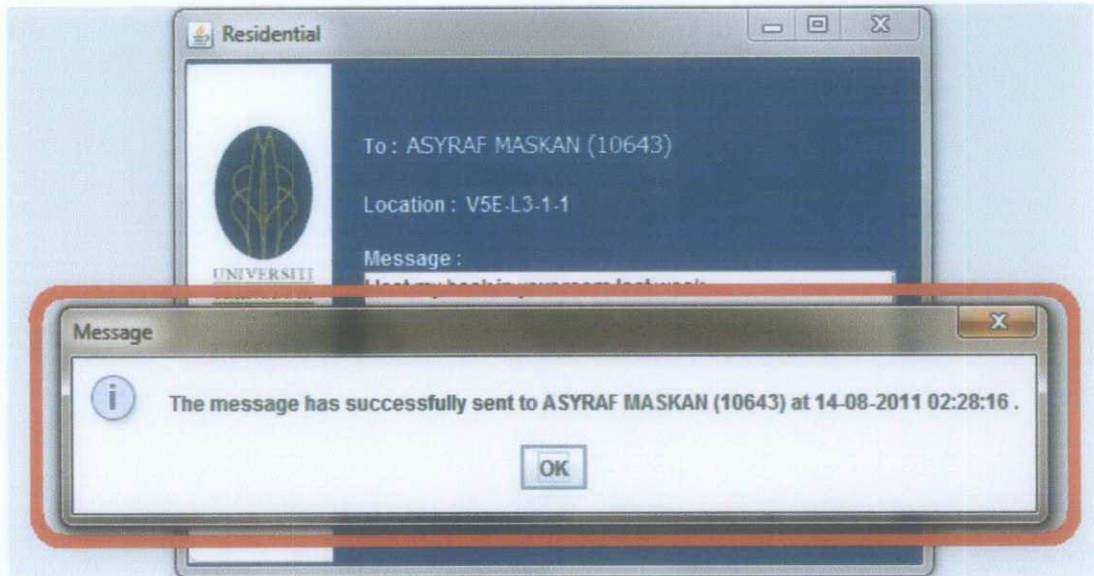
Figure 4.16: Message window for successfully sent message

6) Checking unread messages in the account

At the Main Page (refer Figure 4.5), user is notified by the system of total unread messages.To view the messages, the user need to click the button 'Check Msg' and then the user will be directly sent to the following page (refer Figure 4.17). The page will display list of senders of the message sorted by the date sent.

Figure 4.17: List of senders

The user needs to select the sender in order to view the content of the message. Once the user select the sender, the following page will appear (refer Figure 4.18).

Figure 4.18: View sender's message

This page will display the content of the message sent by the sender to the user. User can respond the message by typing something on the Reply Message text area and then click the button 'Respond' otherwise user can click 'Cancel'. Once the transaction done, the user will be sent to the previous page (refer Figure 4.17).

7) Report Defect of Current Room Staying

Back to the Main Page (refer Figure 4.5), user can report any defect of his/her current room staying by clicking the 'Report Defect' button. A new window will appear (refer Figure 4.19) in which user is required to fill the appropriate field.
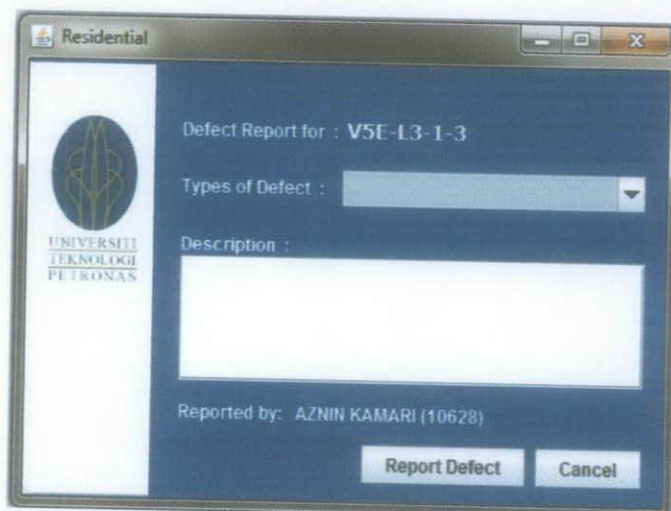
Figure 4.19: Report Defect

Upon clicking 'Report Defect' button, the transaction will be processed and message window will appear (refer Figure 4.20) when the transaction succeeded. The 'Cancel' button will terminate the transaction and close the defect report window.
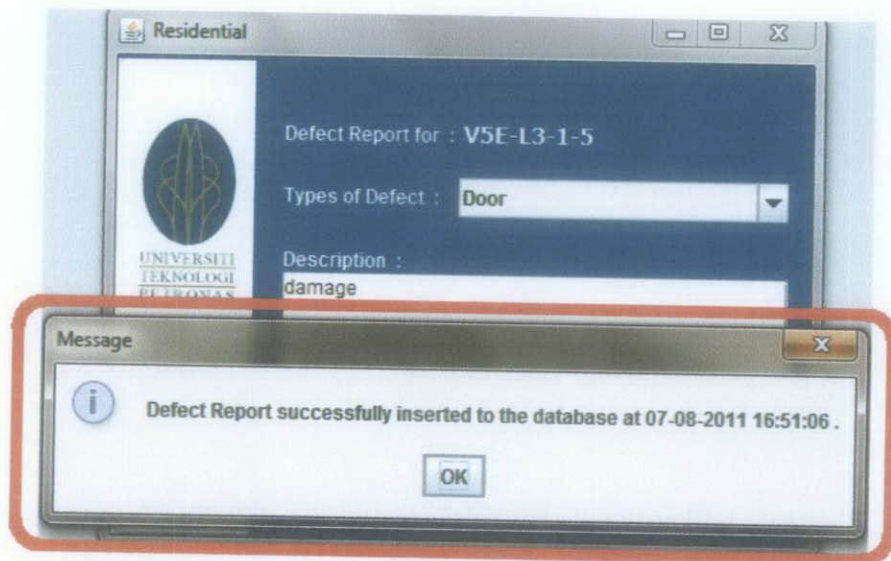
Figure 4.20: Message window for successfully report defect

8) Search User

The system also provides capability for the user to search other user in order to find the user's location to send message or requesting to stay close to the user at the hostel. At the main page (refer Figure 4.5), user need to click on the 'Search User' button. A new window will appear (refer Figure 4.21) in which user need to fill both or either one field of Name and Id.
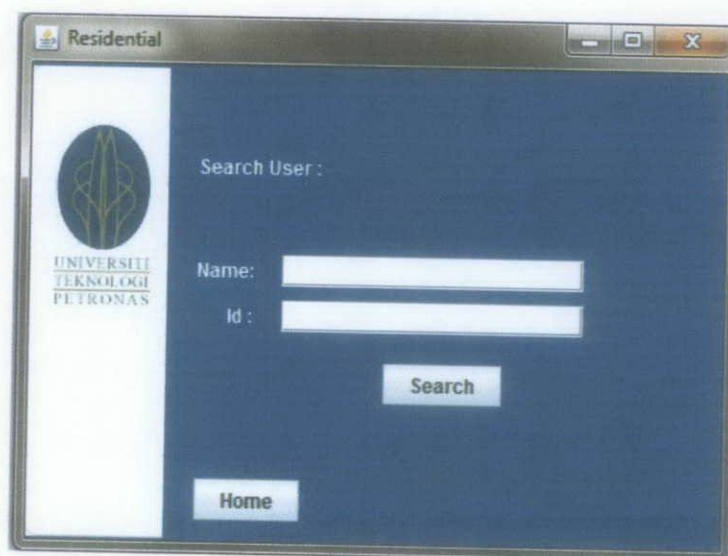
Figure 4.21: Search user window

Once the user entered the 'Search' Button on the window, the user will be directly

sent to the next page (refer Figure 4.22) which listing the closest user based on the keyword inserted by the user.
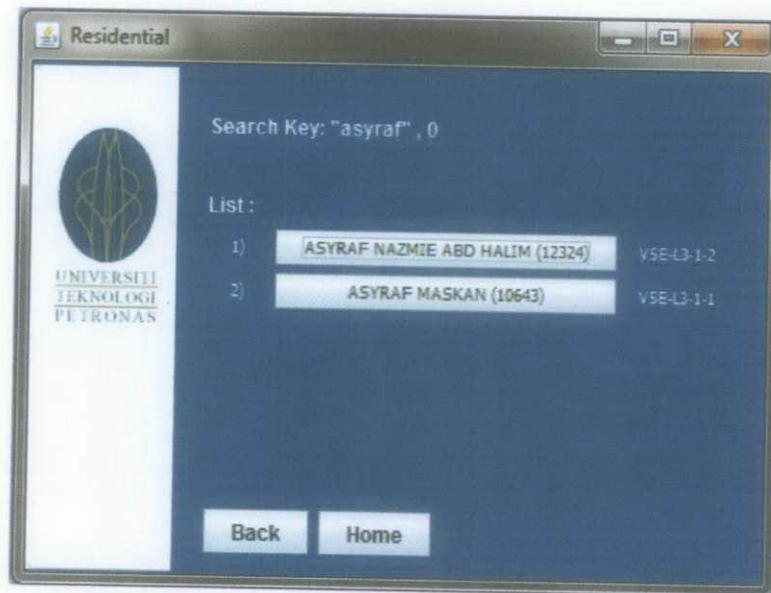
Figure 4.22: User Search Result

Then, user can click the right user and the system will directly send the user to the location of that user. After that, the steps involve are the same with step number 3, 4 and 5 stated before.

9) Exit Window and Logging Off

For security purposes, every close button (refer Figure 4.23) in every window of the system will directly close the current window and directly send the user to the Main Page (refer Figure 4.5) of the system.
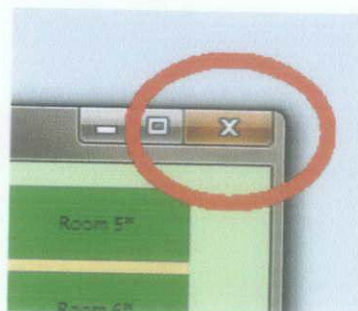
Figure 4.23: Exit Window

When the user click the close button in Main Page will automatically Logging out the user's account and close the window (refer Figure 4.24).
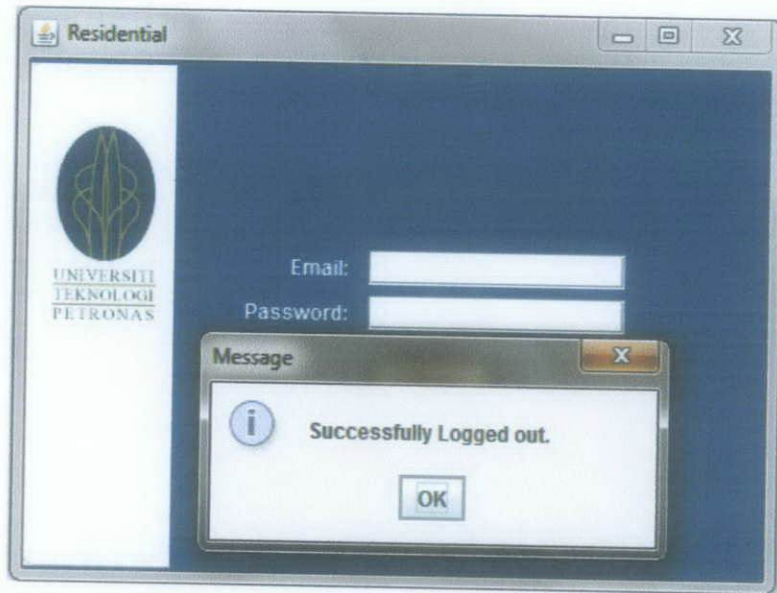
Figure 4.24: Log out from the system

4.1.4 Database Result

In order to connect Netbeans IDE with MySQL, mysql-connector.jar is required. So, mysql-connector is added to the libraries of the project properties (refer Figure 4.25).
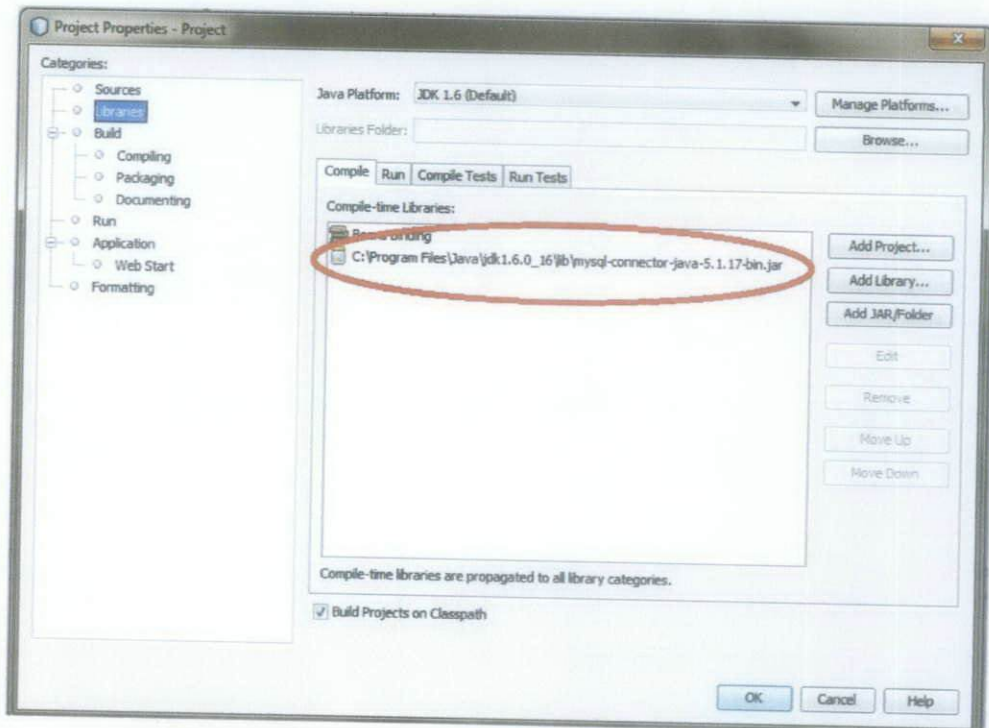
Figure 4.25: mysql-connector.jar added to the library

Once it done, connection is tested by configuring the database services at the Netbeans IDE (refer Figure 4.26). To test the connectivity, simple coding is inserted that include the error message to identify the connectivity problem when running the system (refer Figure 4.27).
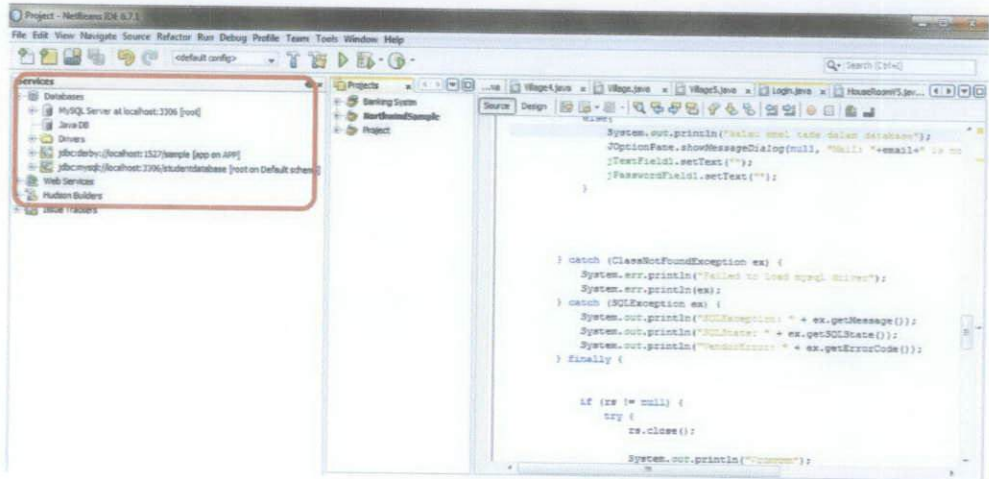
Figure 4.26: Database Service configuration

Figure 4.27: Coding to test DB connection

Database	Table	Table Description
studentDatabase	studentInfo	email, password, name, id, village, level, house, room, contact, image, course
residentialDatabase	residentialInfo	village, level, house, room, name, id, image, course, section
	defectInfo	village, level, house, room, studentReport, id, defectType, description, date
	studentMessage	receiver, receiverId, sender, senderId, message, dateSent, senderLocation

Table 4.2: Database Design

4.1.5 System Architecture
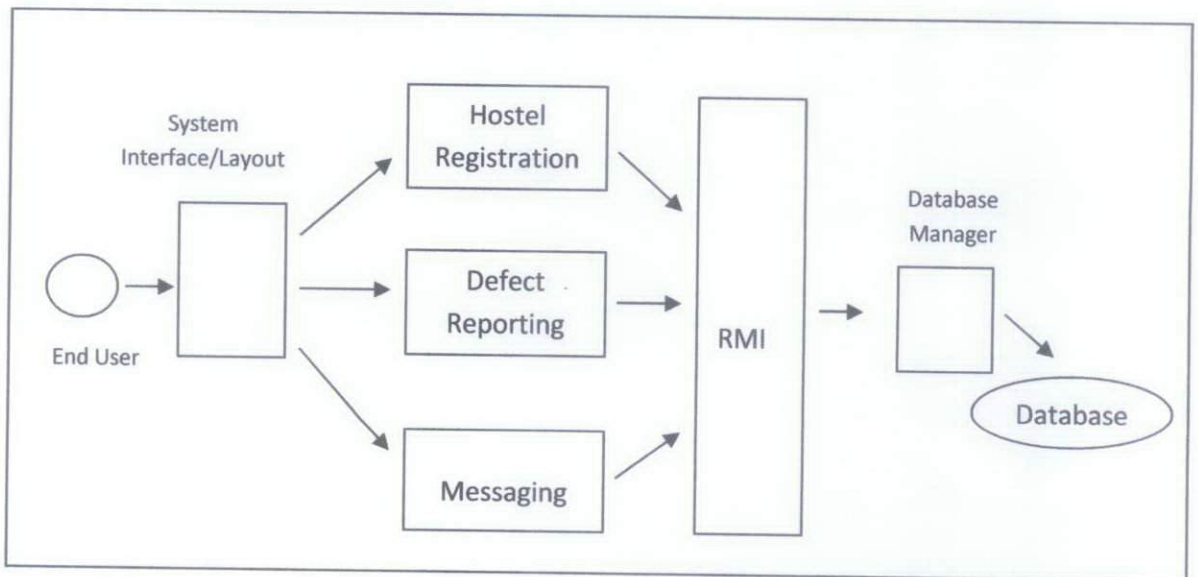
Figure 4.28: System Architecture

End user is dealing with the graphical user interface that consists of three transactions which are hostel registration, report defect and sending message to other users. Those modules are connected to the RMI in which each transaction will invoke the method in the RMI to call a method in the database in order to retrieve data from the database.

4.1.6 Pseudocode

```
1.0    Start
2.0    Prompt user login
       2.1    Check user Password
       2.2    If valid go to 3.0
       2.3    Else go to 2.0
3.0    Main Window
       3.1    Notification on total of unread messages
              3.1.1  go to 4.0
       3.2    Display selection of the Village ( Village 3, 4 and 5)
              3.2.1 if user choose Village 3 go to 5.0
              3.2.2 if user choose Village 4 go to 6.0
              3.2.3 if user choose Village 5 go to 7.0
4.0    The system displays list of sender
       4.1    User click the sender to view the message
       4.2    User can respond the message by writing on the Reply
              Message text are and click the button 'Respond'
       4.3    Otherwise user can click the button 'Cancel'
       4.4    Transaction completed, message of the sender is deleted
              from the database and go to 4.0
5.0    The system display Village 3 layout
       5.1    User select block
       5.2    User select level of block, go to 8.0
6.0    The system display Village 4 layout
       6.1    User select block
       6.2    User select level of block, go to 8.0
7.0    The system display Village 5 layout
       7.1    User select block
       7.2    User select level of block, go to 8.0
8.0    The system display Room Layout according to Village, Block and
       Level
       8.1    User Select Room ('*' indicate the availability of the
              room)
              8.1.1 The system display current room selected
              8.1.2 The system display student details that stayed at
                    the room
              8.1.3 If the room is available, 'Book the Room' button is
                    enabled
              8.1.4 If 'Send Message' button enabled, user can send
                    message to the user, go to 8.2
              8.1.5 Report Defect button provided to report defect
                    according to the room selected
```

```
    8.2     Send Message
        8.2.1 user can send message to the selected user by
              writing in the Message text area and click button
              'Send'
        8.2.2 otherwise user can click button 'Cancel'
        8.2.3 Transaction completed, go to 8.1
    8.3     Transaction Completed, go to 3.0
9.0    Transaction completed, user can click button 'Log out'
10.0   End
```

4.2 Discussion

At the beginning of the development phase, the developer faced a lot of difficulties in designing suitable layout that is accepted by the user. The author solved this problem by familiarize the programming tool and the software development before finalizing the design. The developer also faced difficulties in connecting database with the Netbeans. The author managed to overcome this issue by finding resources and tutorial on the internet. Lastly, there is issues related to error handling in the system and the author manage to solve the problem by come up with suitable error handling management that might occur when the user mistakenly used the system.

So far, the system has been tested by the developer and several students and has no problem encountered. All in all, the level of progress of project development of Interactive Hostel Management System could be concluded as follow the planning with proper ways and approaches.

Interactive Hostel Management System might be useful system for RC unit in UTP to improve their current management which may enhance the existed benefits and in which this system can be used by every student in UTP including new students and students who are returning from industrial training by proving sufficient information of the hostels for them to register and facilities for them to report any defect in their residential college in interactive way and easy to use. The user can do more than expected in the system such as viewing the location of where their friends' currently stay at and communicate with other users.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

Interactive Hostel Management System provides an interactive hostel layout to help students in UTP to select their preferable room and to ease finding the correct location to report any defect within the hostel. With this system, users can also communicate among each other by sending message.

With the support from the programming tool like Java technology and MySQL as the database support tool in order to make the project development of improving current system provided by RC unit to be transformed into reality, it is expected to produce huge and massive impact to the current RC management and can be used as the idea of other management in UTP or other institutions once it is accomplished and implemented.

5.2 Recommendation

4.2.1 Suggested Future Work for Expansion and Continuation

- Develop system hostel management system administration for residential unit to monitor the hostel transaction, keep track of students and account registration of the student
- Enhance the system with instant messenger in which student can send messages to other students in real time by referring the location of the room in the layout when using the system
- Provides file sharing and forum in the system
- Integrate residential database with the whole UTP database so that, other department can access the residential database and RC unit can access other department's database to keep track students fees, summon and so on.

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1.1 Project plan – Gantt chart

No	Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	**Planning**									
	Choose topic	■	■							
	Preliminary research on topic	░	░							
	Specify scope		░							
	Feasibility analysis		░							
2	**Analysis**									
	Requirement gathering	■	■	░	■					
	System analysis			░	░					
	System proposal				░					
	High level of initial design				░					
3	**Design**									
	Pseudocode				■	■				
	Prototype				░	░				

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#	Task
4	**Development/Implementation**
	Coding
5	**Testing**
	User Acceptance Testing
6	**System delivery**

FYP 1

No	Activities							Week							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Title selection/proposal	■	■	■											
2	Announcement on approved topic			■											
3	Research class			■	■		■								
4	Submission of extended proposal							■							
5	Viva: Proposal defense and progress evaluation									■					
6	Interview and Questionnaire									■	■				
7	Interim Report Draft											■			
8	Prototyping												■		
9	Submission of Interim Report													■	

FYP 2

No	Activities	Week													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	System Development	█	█	█	█	█	█	█	█	█	█				
2	Submission of Progress Report							█							
3	Pre-EDX											█			
4	Dissertation												█		
5	SEDEX												█		
6	Viva													█	
7	Technical Report Submission														█
8	Final Dissertation														█

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