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The Implementation of Web-based Management System for Tun Fatimah Residential College

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Abstract: Residential College Management System for Tun Fatimah College (TF) in Universiti Tun Hussein Onn Malaysia (UTHM) is a web-based system which proposed to manage various activities in residential college such as room registration, appealing process as well as reporting process. Identification of the drawbacks of the existing system leads to the designing of the computerized system that will be compatible with the existing system which is more friendly and more graphical user interface (GUI) oriented. By having these kinds of features, the system correspondingly would be more efficient for the users. The project is developed based on the Agile in Sprint methodology. As for the implementation, the system is developed using HTML, CSS, PHP. At the end of the project, it is shown that all the functionalities are well operated as the expected outcome is the same when compared to the actual output. Based on the user acceptance testing, it proves that mostly all the respondents are fully satisfied with the overall performance of the developed system.

Keywords: Management System, Residential College, Agile

1. Introduction

Over the years, technology has revolutionized the world. As the revolution increased at a high speed, the world now is full of high technology and high demand. Manual processes are converted into computer-based processes. As a result, work becomes more productive, and several long hours of work can be shortened into several minutes [1]. Due to all processes done manually, it could result in a high number of errors as humans are unable to work 24 hours and are prone to mistakes [2]. There is a large portion of recently established educational institutions are utilizing the old ordinary procedures for dealing with all the record-keeping and especially for managing hostel facilities as well as processes. This old method of managing records is inefficient [3].

The management of room registration is normally done manually. Students are required to fill up the paper-based registration form and submit it to the office. In Universiti Tun Hussein Onn Malaysia (UTHM), students need to bring along the matric card as proof for handing in the registration form. Specifically, in Tun Fatimah Residential College (TF), if a group of students would like to apply for the

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same room, all the students need to turn up together with their matric cards so that the college officer can process the application. Unfortunately, it is a common problem that they are not able to meet up at a specific time. It might bring out a lot of burdensome as it consumes much of times just to deal with the matric cards. Thus, this kind of difficulty should be resolved by approaching a computerized system.

There are several objectives would like to be achieved in the proposed computerized system. The first one is to analyze and design a comprehensive residential college management system for the student and hostel administration. The second one is to develop a web-based system that allows many accommodations-related functionalities to be done online while the last one is to test whether all the system requirements have successfully been fulfilled on the developed system.

The rest of the paper will be organized as follows. Section 2 will discuss the literature review on the existing systems, section 3 will discuss the methodology used in the proposed system while section 4 is talking about the system analysis and design. Besides, section 5 will focus on the system implementation and testing while section 6 talked about the discussion of the overall project.

2. Related Works

This section will illustrate the literature review that had been done at the beginning of the project development.

2.1 Background of the residential college

A residential college is a budget-oriented, dormitory concept in terms of accommodation that opens for short-term stays to university students [4]. It offers common areas and public-shared facilities which students will gather under the same areas and utilize the facilities sequentially among themselves.

As an example, in Tun Fatimah Residential College (TF), all the students are sharing the same public facilities such as toilets, laundry room, study room, and computer room. They are required to control their turns and sequences while using those facilities provided.

2.2 Technology Used

The main domain to be focused in this project is Web-based Technologies which to be implemented into web-based development. Web application architecture is a framework that retains interactions between application components. It includes middleware systems, user interfaces, and databases.

In developing web-based applications, there are two common Web Development Application enables to develop a dynamic web-based application which are PHP and ASP.Net. For PHP, the source code editor that is primarily used is Bracket. It is free and belongs to open-source software and this kind of editor is created by Adobe Systems under the American software company [5].

2.3 A Study on Similar Systems

Three existing similar systems have been selected for comparison and become the benchmark of the proposed system. The systems are Online Hostel Management System (OHMS), Interactive Hostel Management System (IHMS), and Hostel Management System Based on Fingerprint Authentication.

2.3.1 Online Hostel Management System (OHMS)

The first system to be compared is the Online Hostel Management System or OHMS for the South Eastern University of Sri Lanka [6]. The system can send notifications to the student through emails on their application status and the student can settle their hostel's fees via online.

2.3.2 Interactive Hostel Management System (IHMS)

The second system to be compared is Interactive Hostel Management System (IHMS) for University Technology Petronas [7]. The system allows the existing student to request to change their current room to another room, in the condition of the room they wish to move in must be available.

2.3.3 Hostel Management System based on Fingerprint Authentication

The third system is the Hostel Management System Based on Fingerprint Authentication [8]. Taking the student's security as the highest concern for the residential college's management, a biometric authentication system is used.

2.4 Proposed System: A Web-Based Management System for Tun Fatimah Residential College

The proposed system of this project is mainly to let the student register themselves to get a room through online. Several modules are existing in the proposed system. The first one is the *User Account Management Module*. This module is the first and foremost of the system for students to log in into their account to access the system. Students also used to view and update for the profile. The second one is *the Room Registration Module*. This module is open for students to register to get a room in Tun Fatimah Residential College. Students can select the block and which room they would like to register on. Besides, in this module, the administrators can view and approve the application of the students. While for the third one is the *Room Management Module*. The existing students can use this module to appeal to get a room and they will get to know their status whether succeeded or not. The allocation of the room is made randomly by the residential college's management. The last module is the *Complaints Reporting Module*. This module is available for students lodging a report on the items that have been found in the room. The administrator will receive the report and will attend to the issue accordingly.

2.5 Comparison between similar systems and proposed work

In Table 1, it shows the comparison between three existing systems with the proposed system. From the results shown, the functionalities of proposed system are relatively more compared to the others, and it proves that the system is unique. The area of focused on the proposed system is the registration of room which is comparatively important for the students in Tun Fatimah residential college.

Table 1: Comparison between Existing Systems with the Proposed System

System	Online Hostel Management System	Interactive Hostel Management System	Hostel Management System Based on Fingerprint Authentication	Proposed System
Login/ Registration	Yes	Yes	Yes	Yes
Room Registration	Yes	Yes	Yes	Yes
Check-In/Check-Out	Yes	Yes	Yes	Yes
Faulty and Defect Item(s) Complain	No	Yes	No	Yes
Administrator Access/Reporting	Yes	Yes	Yes	Yes
Room Appeal for Existing Student	No	No	No	Yes
Area to Focused	Payment on hostel fees	Defect or faulty items	Security of the student	Registration of room
Programming Language	PHP & MySQL	JavaScript & MySQL	Biometric System	PHP & MySQL
Technology	Web-Based	Web-Based	Web-Based	Web-Based

3. Methodology

This project is developed based on the Agile in Sprint model. The Agile software development concept has been introduced through a conference at the University of Utah by Agile teams [9]. The figure below shows the diagram of Agile in Sprint Methodology.

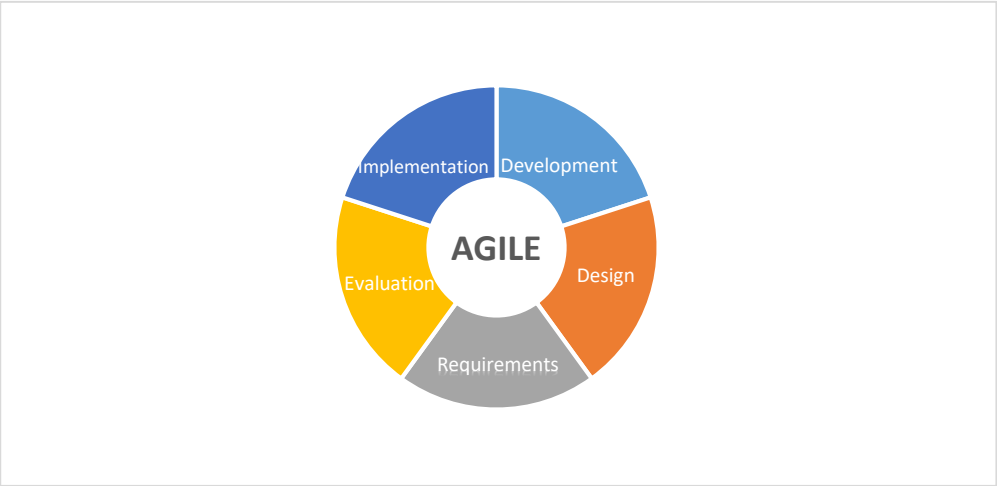

Figure 1: Agile Sprint Methodology [10]

There is a total of 5 sprints included in this methodology. Every single sprint has an expected output as well. The relevant sprints include in the Agile Sprint methodology are Requirement, Design, Development, Implementation, and Evaluation. Table 2 presents the overall workflow.

Table 2: Workflow of development for Tun Fatimah Residential College Management System

Sprints	Explanation	Output
Requirements	-The phase is to gather all the requirements from the staff and students of residential college regarding the proposed system to be implemented.	-The output such as problem statements, and requirements from staff and students, as well as from deep analysis about the current constraints.
Design	-Design and list out the suitable flow of a well-structured and systematic residential college management system.	-The output such as storyboard, prototype specifications, and database design are figured out for each of the elements.
Development	-The system's construction and the coding programming will be done based on the module design of developed residential college management system.	-All the functionalities and prototypes are included and being developed into an efficient web-based residential college management system.
Implementation	-This phase will teach end-users on how to handle the system and how their requirements and analysis have proceeded.	-To correct is any error detected in the developed web-based system and perform troubleshooting accordingly.
Evaluation	-This phase will carry out a short survey regarding the functionalities, and overall performance of the system by enabling end-users to vote for the condition statements to test the system.	-All the recommendations and suggestions are collected, and those results will be analyzed in the form of a diagram and table. Well-rated results prove for an efficient residential college management system.

4. System Analysis and Design

4.1 System Analysis

Requirements engineering or as known as requirements analysis is now widely recognized as a crucial part of software engineering and has established itself as a distinct research area. Equally important is how requirements drive the rest of software development [11]. The requirements for the Tun Fatimah Residential College Management System are important as it serves as the main reference. Due to the limitation of this paper, only the Flow Chart Diagram for students, and the Context Diagram will be shown here. While the Data Flow Diagram (DFD) and Entity Relationship Diagram (ERD) can be seen in Appendix B and C respectively.

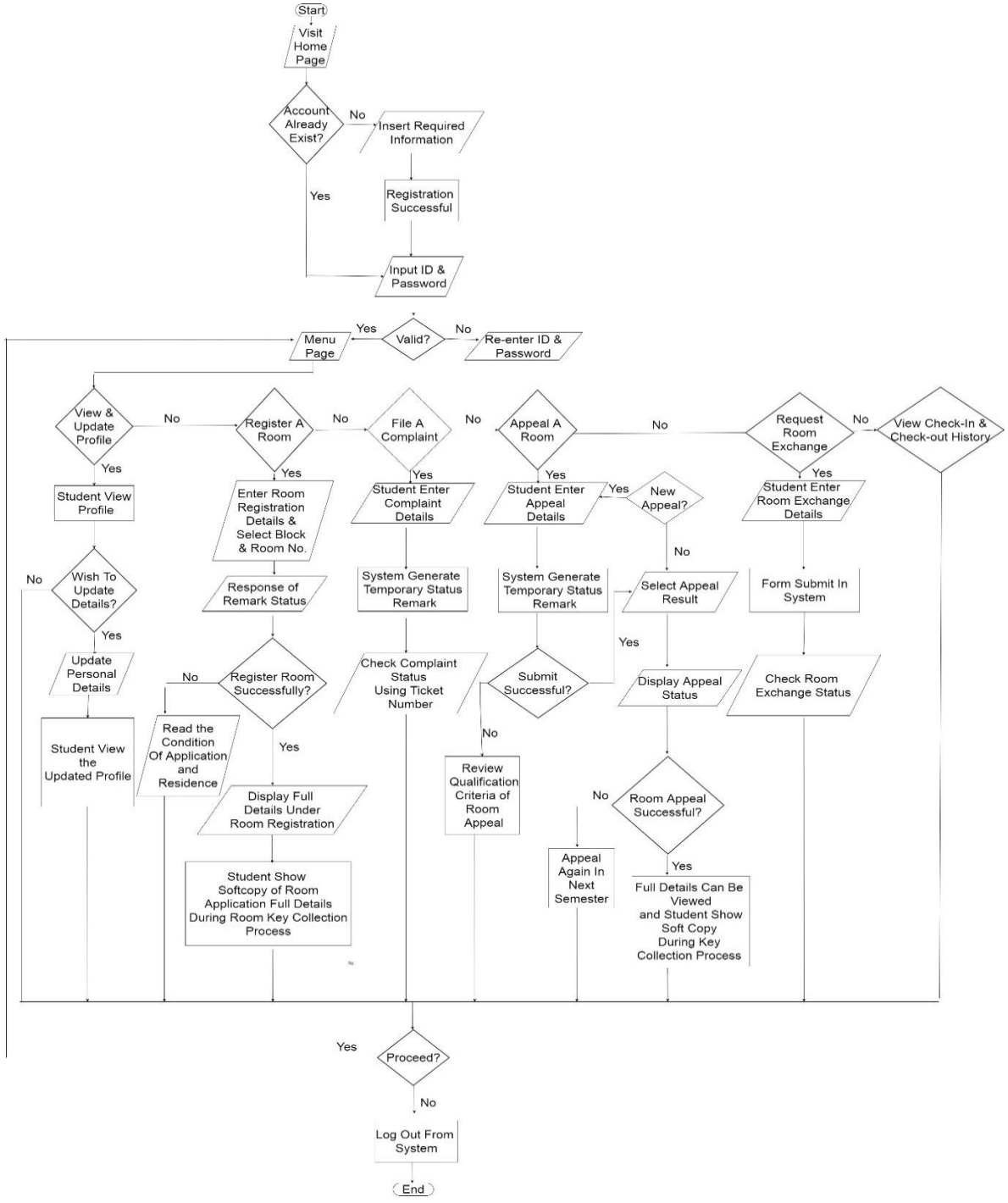

Figure 2: Flowchart for User Side

4.1.1 Flow Chart

Figure 2 shows the example of a flowchart for the student side. Students can undergo the services provided by following the flowchart. This flowchart consists of View and Update Profile, Register A Room, File A Complaint, Appeal A Room, Request Room Exchange, and View Check-In and Check-Out History services.

4.1.2 Context Diagram

A context diagram is a diagram that represents the entire system. The purpose of this diagram is to bring out expected inputs and outputs from the system. Figure 3 shows the context diagram of the Tun Fatimah Residential College Management System. The context diagram shows that the system has 2 entities involved which are student and administrator.

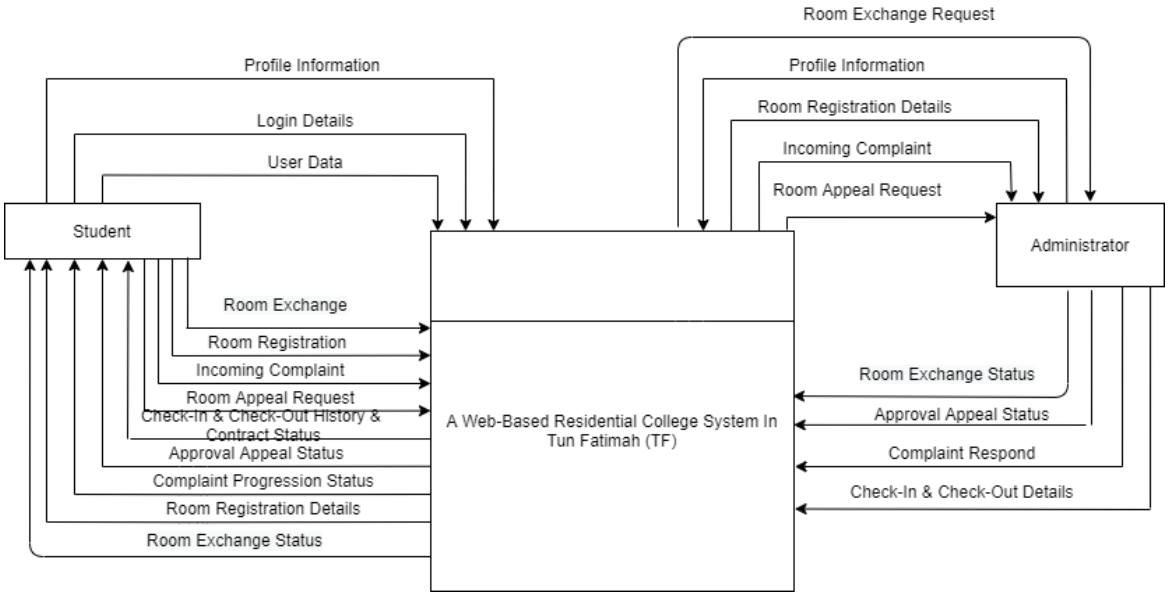

Figure 3: System Context Diagram

4.1.3 Data Flow Diagram

Data Flow diagram level 0 is a diagram where the whole system is represented as a single process. Appendix B shows the DFD level 0 diagram of the proposed system. The Data Flow Diagram shows the breakdown for each process for the student in using the system. The student can use the system for profile updating, room registration, room appealing, and room complaint.

4.1.4 Entity-Relationship Diagram (ERD)

An entity-relationship model (ERD) shows the entities and relationships between tables within the database. Appendix C shows the ERD diagram for the entire proposed system.

5. System Implementation and Testing

5.1 System Implementation

This section introduces the implementation and user interface of every activity for the developed system.

5.1.1 User Account Management Module

Figures 4 and 5 show the code segment of the login page and user registration page. Both pages including the function of validation. Figure 6 shows the user interface of user login.

```php
<?php
session_start ();
$con= mysqli_connect('localhost', 'root');
mysqli_select_db ($con, 'residential_college');
$name = $_POST['user'];
$pass = $_POST['password'];
$s = "select * from usertable where name = '$name' && password = '$pass'";
$result = mysqli_query($con, $s);
$num = mysqli_num_rows($result);
if($num == 1){
    $_SESSION['username'] = $name;
    header('location:student profile latest.php');
}else{
?>
<script type="text/javascript">
alert("Username or password is incorrect! Try Again");
window.location.href = "login user.php";
</script>
<?php
}
?>
```

Figure 4: Code Segment of the login page

```php
if($num == 1){
echo'
 <script> alert("Username is taken! Please enter a new username.");</script>';
 echo' <script> window.location.href = "registration latest.php";</script>';
}else if ($pass != $cpass){
echo '<script> alert("Passwords is unmatch! Please re-type.");</script>';
echo' <script> window.location.href = "registration latest.php";</script>';
}else if ($num1 == 1){
 echo '<script> alert("Email Already Taken! Please enter new email address!");</script>';
 echo' <script> window.location.href = "registration latest.php";</script>';
}else if ($domain != 'siswa.uthm.edu.my'){
 echo '<script> alert("This domain is not accepted! Only UTHM mahasiswa and mahasiswi is allowed to access into system!");</script>';
 echo' <script> window.location.href = "registration latest.php";</script>';
}else {
   $reg= " INSERT INTO usertable (name, password, fullname, course, faculty, gender, handphoneNo, email, address, sessionEnroll) VALUES
   ('$name','$pass','$fullname','$course','$faculty','$gender','$handphoneNo','$email','$address','$sessionenroll')";
    mysqli_query($con, $reg);

}

?>
```

Figure 5: Code Segment of the user registration page

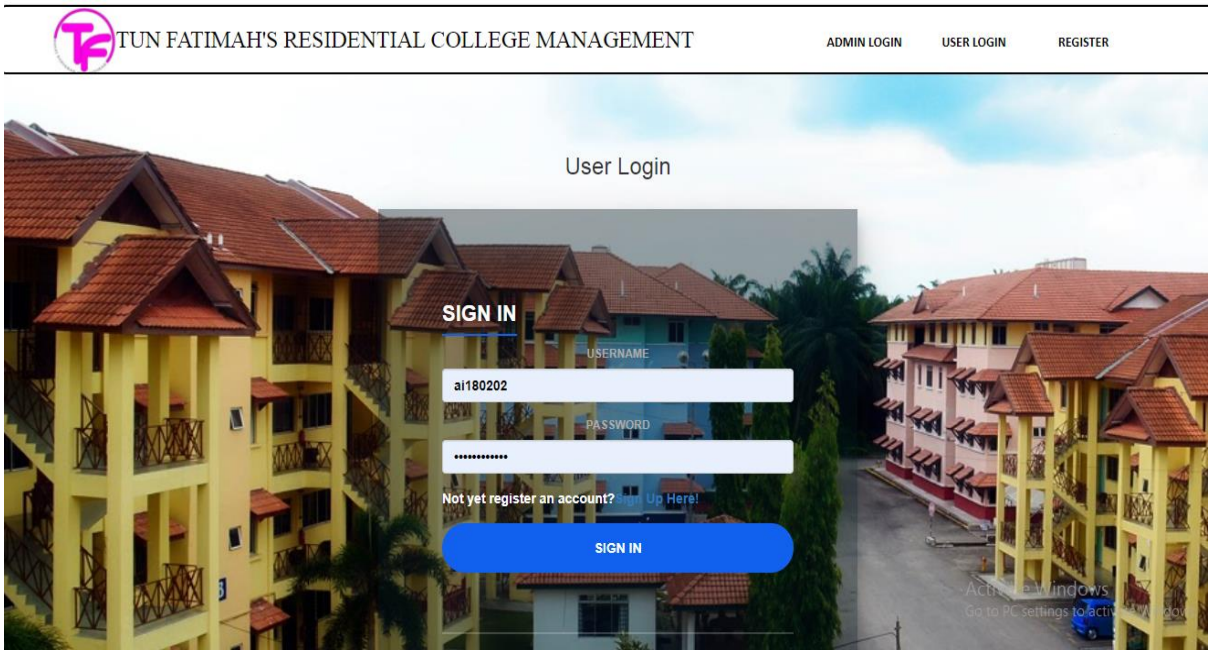

Figure 6: The user interface of user login

In this module, students also enable to view all the relevant personal details while login into the account, and they are allowed to update for the latest information in their profile. They also allow changing their password when it is needed. Besides, the administrator is allowed to register new users, and they can manage student profiles using CRUD operation. Figures 7 and 8 show the coding implementation and user interface of the user account administrator panel.

```
<?php
$i=1;
while($row = mysqli_fetch_array($search_result)):?>
<tr>

    <td style="font-size:15px;"><?php echo $i;
     $i++;?></td>
    <td style="font-size:15px;"><?php echo '<img src="'.base64_encode($row['image1']).'"
    width="120" height="120" >' ;?></td>
    <td style="font-size:15px;"><?php echo $row['fullname'];?></td>
    <td style="font-size:15px;"><?php echo $row['name'];?></td>
    <td style="font-size:15px;"><?php echo $row['sessionEnroll'];?></td>
    <td style="display:none"><?php echo $row['course'];?></td>
    <td style="display:none"><?php echo $row['faculty'];?></td>
    <td style="display:none"><?php echo $row['gender'];?></td>
    <td style="display:none"><?php echo $row['handphoneNo'];?></td>
    <td style="display:none"><?php echo $row['email'];?></td>
     <td style="display:none"><?php echo $row['address'];?></td>
       <td style="font-size:15px;"><?php echo $row['DateTime'];?></td>
      <td style="display:none"><?php echo $row['feesStatus'];?></td>
    <td>
      <button type="button" class="btn btn-success viewbtn">VIEW</button>    
      <button type="button" class="btn btn-success editbtn" style="margin-left:20px;margin-top:0px;">EDIT</button>
      <button type="button" class="btn btn-danger deletebtn" style="margin-left:210px;margin-top:-38px;">DELETE</button>
      </td>
</tr>

<?php endwhile;?>
 </tbody>
```

Figure 7: Code Segment of the user account administration

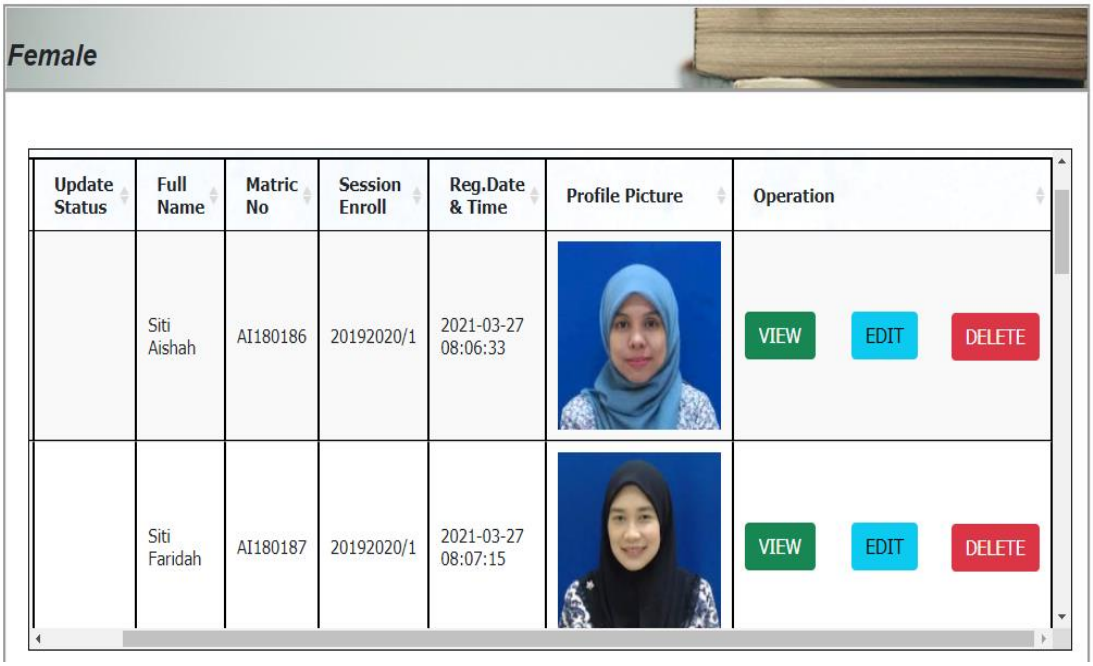

Figure 8: The user interface of the user account administrator panel

5.1.2 Room Management Module

Figure 9 shows the code segment for the validation and restriction of the room registration process. For example, a female student is only allowed to stay in Block A and Block B while a male student only allows accommodating in Block C and Block D. Besides, Figure 10 shows the user interface of the room registration application form.

```
if($gender == 'Female' && $selectblock == 'G5C-'){
echo'
 <script> alert("Please select again room block! Female students just allow to select Block A and Block B.");</script>';
 echo' <script> window.location.href = "roomregistrationtest.php";</script>';
}else if ($gender == 'Female' && $selectblock == 'G5D-'){
echo '<script> alert("Please select again room block! Female students just allow to select Block A and Block B.");</script>';
echo' <script> window.location.href = "roomregistrationtest.php";</script>';

}else if ($gender == 'Male' && $selectblock == 'G5A-'){
echo '<script> alert("Please select again room block! Male students just allow to select Block C and Block D.");</script>';
echo' <script> window.location.href = "roomregistrationtest.php";</script>';

}else if ($gender == 'Male' && $selectblock == 'G5B-'){
echo '<script> alert("Please select again room block! Male students just allow to select Block C and Block D.");</script>';
echo' <script> window.location.href = "roomregistrationtest.php";</script>';
}
else if ($total >= 5){
echo '<script> alert("Your selected room is full! Please select again! Thank You.");</script>';
echo' <script> window.location.href = "roomregistrationtest.php";</script>';
}
else {
   $reg= " INSERT INTO room_registration (Fullname, Matric_No, Session_Enroll, Email, HandphoneNo, Gender, Course, Faculty, Room_Block, Room_No, RoomRate, Parent_Name,
   Parent_Contact_No, Relation, Address) VALUES
   ('$fullname','$user','$sessionEnroll','$email','$handphoneno','$gender','$course','$faculty','$selectblock','$selectroom','$roomrate','$name','$contactno','$relation','$addre
   ss')";
    mysqli_query($con, $reg);
    echo '<script> alert("Register Successfully");</script>';
    echo "<h1 style='text-align:center;margin-top:100px;margin-left:100px;'>Room Registration Successfully! Your Room ID is '$selectblock $selectroom'.</h1>";
};

?>
```

Figure 9: Code Segment of the validation and restriction of the room registration process

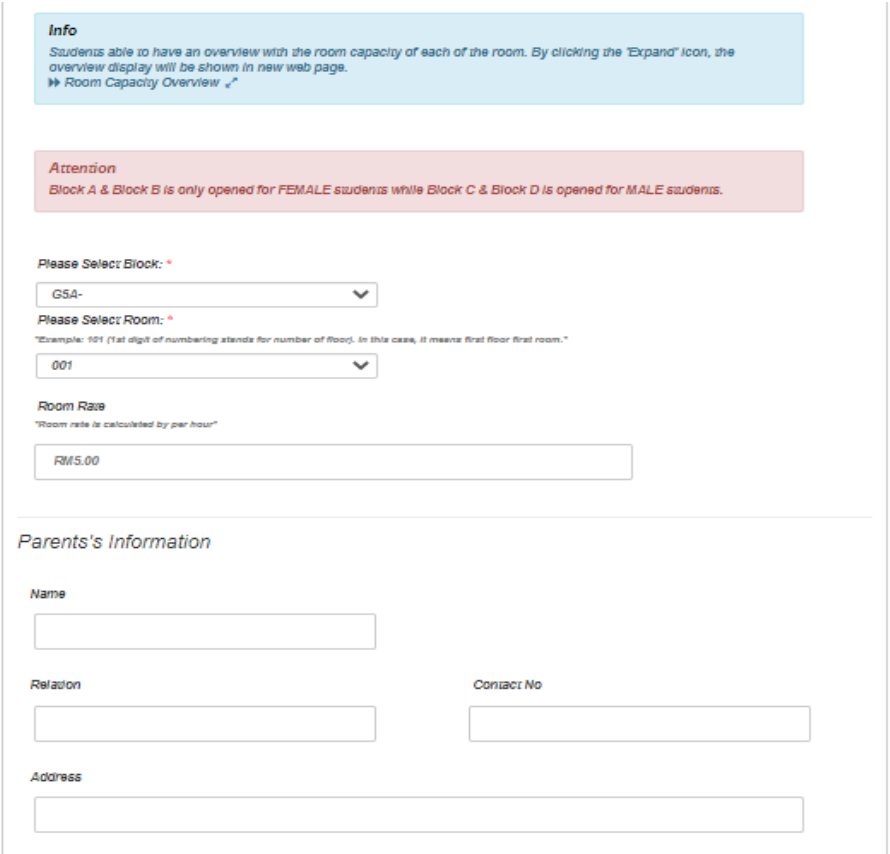

Figure 10: The user interface of the room registration application form

In addition to this, students also can view the room and facilities description of the residential college, and the general view of overall capacity, search for the check-in, check-out history, and contract status as well as request for room exchange application under this module. Also, the administrator can take proper actions on the management of check-in, check-out, and contract status, room capacity, as well as room exchange application. The coding implementation and sample user interface of room capacity's overview management are shown in Figures 11 and 12 as below.

```php
<?php
$con= mysqli_connect('localhost', 'root');
mysqli_select_db ($con, 'residential_college');
$resnum = mysqli_query($con, "SELECT COUNT(Room_No) AS `count` FROM `room_registration` WHERE Room_Block = 'G5A-' AND Room_No = '001' ") or die(mysql_error());
?>
<?php
if (mysqli_num_rows($resnum) > 0) {
?>
<?php
  $i=1;
while($row = mysqli_fetch_array($resnum)) {
?>
<p style="color:black">Room ID: G5A-001</p>
<p style="color:black">Capacity: <?php echo $row['count']?> of 5 (MAX) Joined</p>
<?php
}
?>
<?php
}
?>
<?php
$con= mysqli_connect('localhost', 'root');
mysqli_select_db ($con, 'residential_college');
$resnum = mysqli_query($con, "SELECT * from room_registration WHERE Room_Block = 'G5A-' AND Room_No = '001' ") or die(mysql_error());
?>
<?php
if (mysqli_num_rows($resnum) > 0) {
?>
<?php
  $i=1;
while($row = mysqli_fetch_array($resnum)) {
?>
<p style="color:black;font-size:13px;"><?php echo $i; $i++;?>. <?php echo $row['FullName']?> <?php echo $row['Matric_No']?></p>
?php
}
?>
<?php
}
?>
```


Figure 11: Code segment of the overview room capacity management

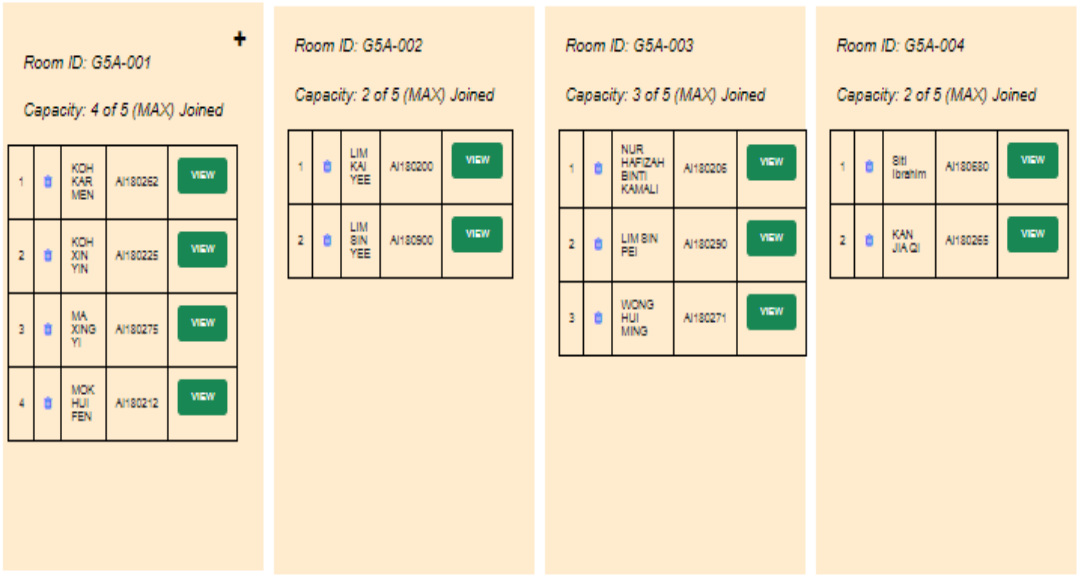

Figure 12: The user interface of the room capacity's overview management

5.1.3 Room Appeal Management Module

Figure 13 shows the code segment for the room appealing process. The administrator assigns the rooms accordingly for those students that applied successfully. Figure 14 shows the user interface of the room's appealing application form.

```
if ($total >= 5){
echo '<script> alert("Selected room is full. Please assign a new one.");</script>';
echo' <script> window.location.href = "adminpanelAppeal2.php";</script>';
}
else if($gender == 'Female' && $selectblock == 'G5C-'){
echo'
 <script> alert("Please select again room block! Female students just allow to select Block A and Block B.");</script>';
 echo' <script> window.location.href = "roomregistrationtest.php";</script>';
}else if ($gender == 'Female' && $selectblock == 'G5D-'){
echo '<script> alert("Please select again room block! Female students just allow to select Block A and Block B.");</script>';
echo' <script> window.location.href = "roomregistrationtest.php";</script>';
}else if ($gender == 'Male' && $selectblock == 'G5A-'){
echo '<script> alert("Please select again room block! Male students just allow to select Block C and Block D.");</script>';
echo' <script> window.location.href = "roomregistrationtest.php";</script>';
}else if ($gender == 'Male' && $selectblock == 'G5B-'){
echo '<script> alert("Please select again room block! Male students just allow to select Block C and Block D.");</script>';
echo' <script> window.location.href = "roomregistrationtest.php";</script>';
}
else {
   $inst="UPDATE appealtable set status = '$status', standard = '$standard', updatestatus = '$updatestatus', administrator = '$administrator', contractperiod = '$contract',
   selectblock = '$selectblock', selectroom = '$selectroom' ,assignstatus = '$assignstatus' where appealID = '$appealID'";
    $inst1="INSERT INTO room_registration (Room_Block, Room_No) VALUES ('$selectblock','$selectroom')";
    $inst_run= mysqli_query($con, $inst);
    $inst1_run= mysqli_query($con, $inst1);
if ($inst_run){
echo '<script> alert("Updated Successfully! ")</script>';
echo "<script> window.location.href = 'adminpanelAppeal2.php' </script>";
}
else
{
echo '<script> alert("Room No is not assign successfully!");</script>';
}

}
```


Figure 13: Code Segment of room appealing process

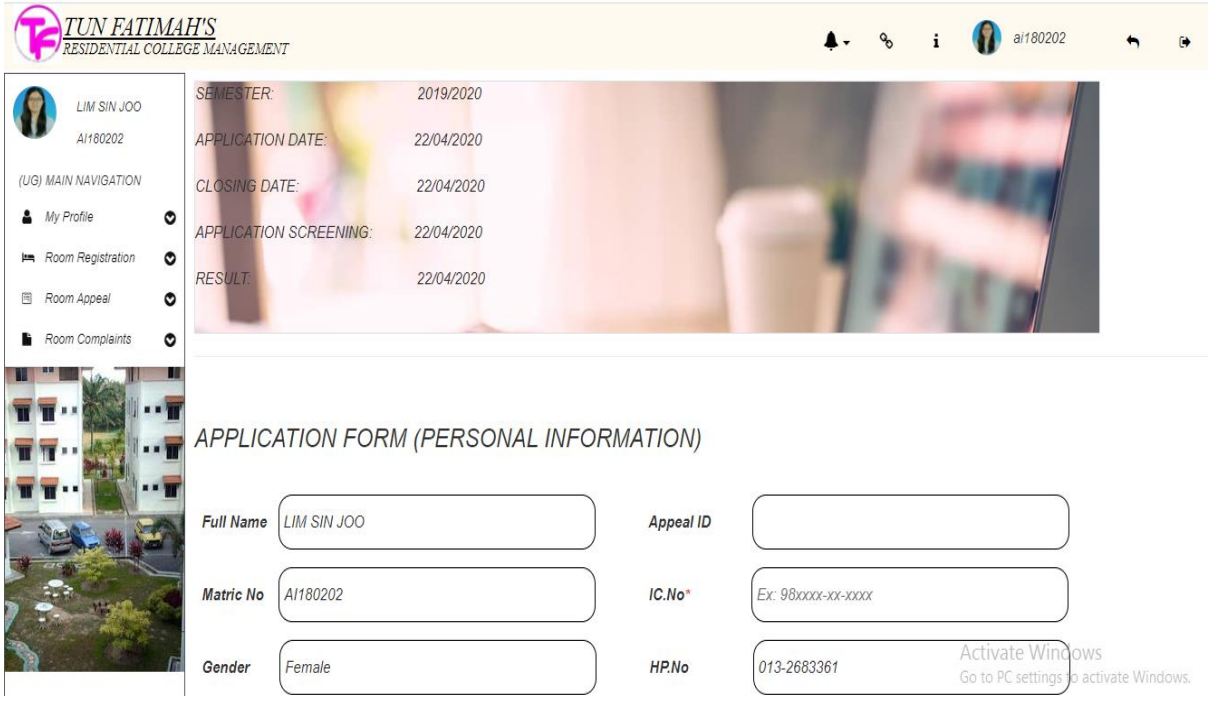

Figure 14: The user interface of room appealing application form

In addition to that, students enable to view the room's appealing application status when the application result is out. Also, the administrator can take appropriate actions on the requests made by students.

5.1.4 Complaints Reporting Management Module

Figure 15 shows the code segment for the room complaints process. The administrator can update for room complaints status when there is any latest information. Figure 16 shows the user interface of the room complaints reporting application form.

```php
<?php
session_start();
$con= mysqli_connect('localhost', 'root', '');
mysqli_select_db ($con, 'residential_college');
if(isset($_POST['updatedata']))
{
$complaintID = $_POST['edit_complaintID'];
$status = $_POST['status'];
$standard = $_POST['standard'];
$stage = $_POST['stage1'];
$overallstatus = $_POST['overallstatus1'];
$updatestatus = $_POST ['currentDate1'];
$technicianincharged = $_POST ['technician'];
$technicianID = $_POST ['technicianID'];
$technicianremark = $_POST ['technicianremark'];
$complaintimage = addslashes(file_get_contents($_FILES['f2']['tmp_name']));
$inst="UPDATE complainttable set status = '$status', standard = '$standard', statusupdate = '$updatestatus', technician = '$technicianincharged', technicianID = '$technicianID',
technicianremark = '$technicianremark', complaintimage = '$complaintimage', stage = '$stage', overallstatus = '$overallstatus' where complaintID = '$complaintID'";
$inst_run= mysqli_query($con, $inst);
if ($inst_run){
echo '<script> alert("Data Inserted");</script>';
echo "<script> window.location.href = 'adminpanelComplaints1.php' </script>";
}
else
{
echo '<script> alert("Data Not Updated");</script>';
}

}
?>
```

Figure 15: Code Segment of the room complaints process

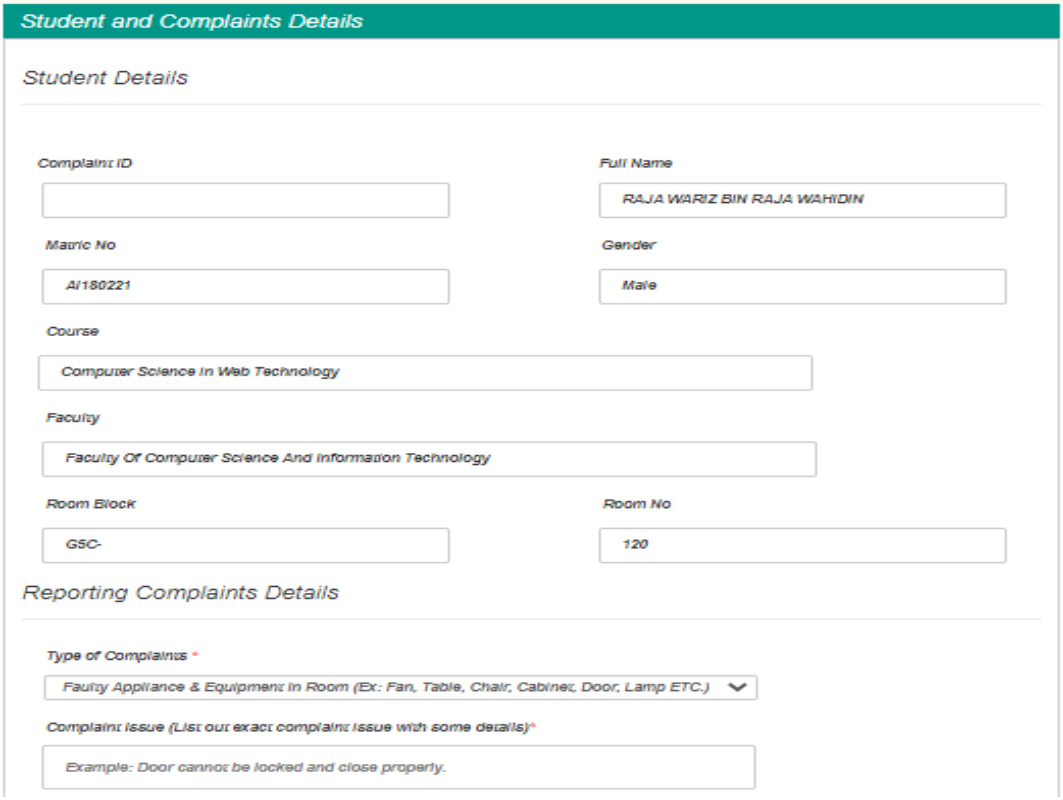

Figure 16: User interfaces of room complaints reporting application form

Apart from this, students also can track the reporting application status, cancel for a certain ticket ID of complaint case, and review for the existing room complaint cases. Besides, the administrator can take proper actions on the reporting application requests made by students and view the details of the technicians that will oversee the room complaints.

5.2 System Testing

There are two types of testing involved which are functional testing and user acceptance testing. Functional Testing is a testing based on the figuration of test cases for each of the modules on the specification of the system while User Acceptance Testing (UAT) is a testing conducted to verify the developed system before moving forward to the environment of production.

5.2.1 Functional testing

i. User Account Management Module

Table 3: Test Cases for User Account Management Module

Test Case	Expected Outcome	Final Outcome
-Insert exact username and password.	-Directing user to his/her profile page and able to view the menu of the system.	Succeed
-Enter all the actual information and access to register button.	-The user account was created successfully and able to access the system at any time.	Succeed
-All the information is saved successfully in the student database and check whether can be retrieved as well as can be updated when there is the latest information.	-All the details can be displayed on the student's profile and the user able to view through at any time. Users also can view the updated information.	Succeed

ii. Room Management Module

Table 4: Test Cases for Room Management Module

Test Case	Expected Outcome	Final Outcome
-Provide all the current details capacity in terms of empty, filled, not offered, overall as well as for each of the block and floor.	-Users can track the latest capacity information and get to know which of the block and floors having the most and the least of students' accommodation.	Succeed
-Set up restriction for ended-contract students which they are not allowed to proceed into the room registration process.	-A warning message box pops out saying that the user is not allowed to register hostel room because the contract is ended.	Succeed
-Set up a limitation of 5 persons only for each room and once exceeds, the registration being rejected.	-Users able to register for a room when is still under the limit while students are failed to register for that room, they need to select another room.	Succeed

iii. Room Appeal Management Module

Table 5: Test Cases for Room Appeal Management Module

Test Case	Expected Outcome	Final Outcome
-Set up restriction for under-contract students which they are not allowed to proceed into room appealing process.	-Users that under contract are unable to access into room appealing application form.	Succeed
-All the information can be saved in the database and the review of details can be accessed at any time.	-Administrators receive all the information and analysis, as well as status assigning, are done for each of the students.	Succeed
-Application status will be updated at a specific time.	-Users can view the application status and print it as a reference detail.	Succeed

iv. Room Complaints Management Module

Table 6: Test Case for Room Complaints Management Module

Test Case	Expected Outcome	Final Outcome
-Application of room complaints can be accessed at any time.	-All the data will be recorded in a database and retrieve to the administrator side.	Succeed
-Tracking every room complaint case every time comes with a list of details.	-All the tracking details being displayed in a list of data tables and students able to filter ticket ID.	Succeed
-Cancellation of room complaints ticket ID can be done at any time.	-Administrators will assign cancellation while getting information from students.	Succeed

Overall, the test cases implemented in each of the modules are all passed which are shown in the above-listed tables. It proves that all these execution conditions are achieved the testing objective in this developed system. Besides, it also ensures that all the functionalities in the system are functioning well and logically.

5.2.2 User Acceptance Testing

There is a total of 30 respondents involved in this testing which are 6 staff of Tun Fatimah residential college and 24 students respectively. There is a total of 120 responses be taken from 4 questions that are listed in the bar chart diagram shown in Figure 17. Each of the columns in the bar chart diagram represents the corresponding questions. The analysis result in Figure 17 shows that there is a total of 17 persons voted as *Agree* while 13 persons are voted as *Strongly Agree* for the first question. Besides, for the second question, there is a total of 18 persons voted as *Agree*, 11 persons voted as *Strongly Agree* while only 1 person voted as *Neutral*. Furthermore, 6 persons voted as *Neutral*, 17 persons voted as *Agree*, and 7 persons voted as *Strongly Agree* for the third question while for the last question, there are 7 persons voted as *Neutral*, 13 persons voted as *Agree*, and 10 persons voted as *Strongly Agree*.

The analysis of the percentage for *Neutral, Agree, and Strongly Agree* is illustrated in the pie chart diagram shown in Figure 18. Among the respondent, 34.2% of responses *Strongly Agree* that the overall system developed is perfect and standardizable. Besides, 54.2% of responses choose to rate for *Agree* in this section. Meanwhile, only 11.7% of responses consider the overall system developed to be normal as they rated it as *Neutral*. Figure 17 shows the overall analysis for each of the questions in bar chart diagram and Figure 18 illustrates the analysis of percentage for the responses in pie chart diagram.

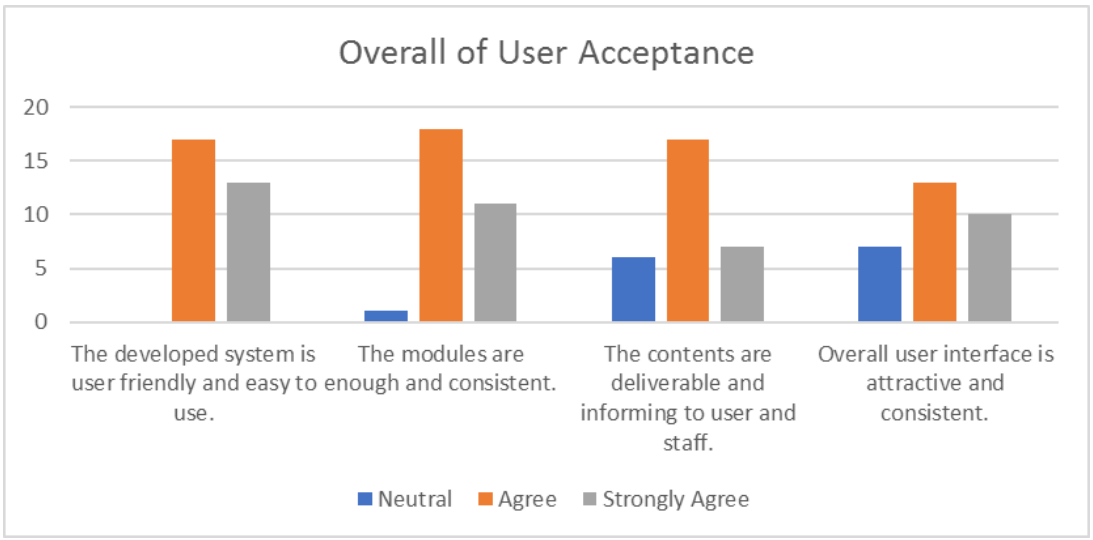

Figure 17: Bar chart diagram for Overall of User Acceptance

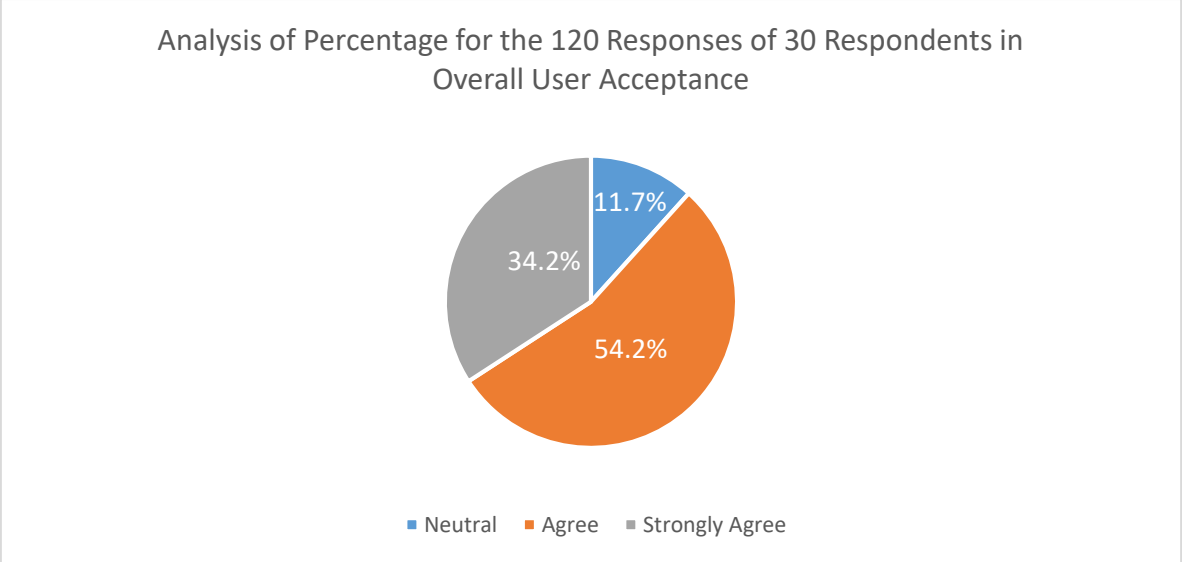

Figure 18: Pie chart diagram for the Analysis of Percentage in Overall User Acceptance

6. Discussion and Conclusion

In conclusion, Tun Fatimah Residential College Management System is successfully developed and achieved all the targeted objectives. All the proposed modules also have been developed and implemented as the expected outcomes. Users are allowed to undergo all the main processes such as room registration, room appealing, room exchanging, as well as room complaints while accommodating in Tun Fatimah Residential College. Users are also able to view all the details and status for each of the processes. Besides, they also will receive notification on the behalf of administrator side. All the users and administrators under this residential college enable to register, log in, and log out of an account. However, some limitations do exist in the developed system.

6.1 Limitation

The most concerning limitation is the chat session between users and administrators. As communication is very important for the interaction, therefore chat session functionality can be considered in this developed system. Besides, the developed system can be included with more informative details such as the user manual. Furthermore, there are some recommendations for future works are listed below.

6.2 Recommendation of Future Works

To enhance the performance of the Tun Fatimah Residential College Management System, there are several improvements to act. One of the improvements is to have a chat platform between administrators and users. By setting up the function, users can resolve all the doubts being met by them. As an example, when a student would like to cancel for a room complaint case, the student does not need to come to the office just to inform the cancellation but by using the provided chat platform in the system and this issue can be solved more efficiently and easily.

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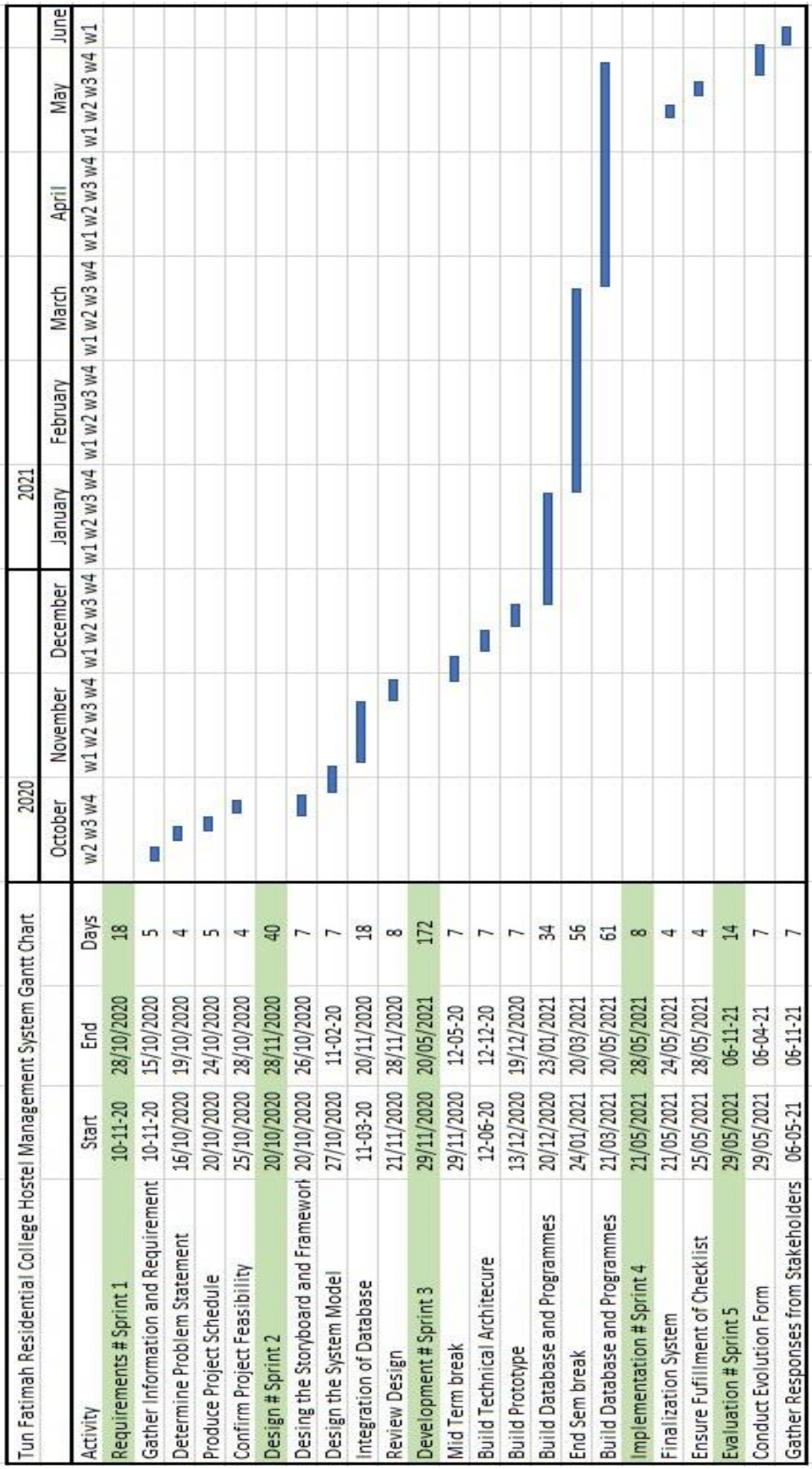
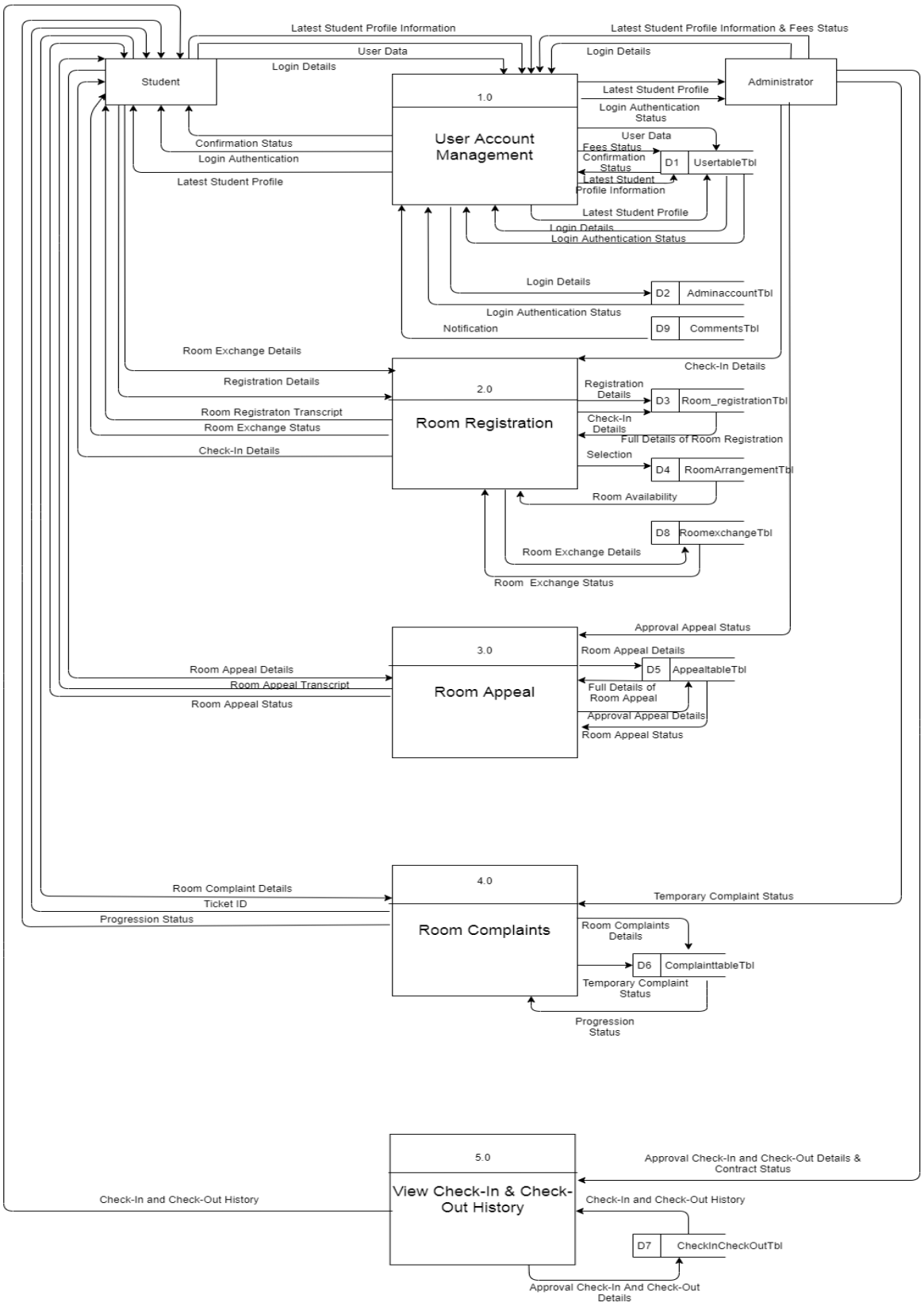
Appendix A

Gantt Chart



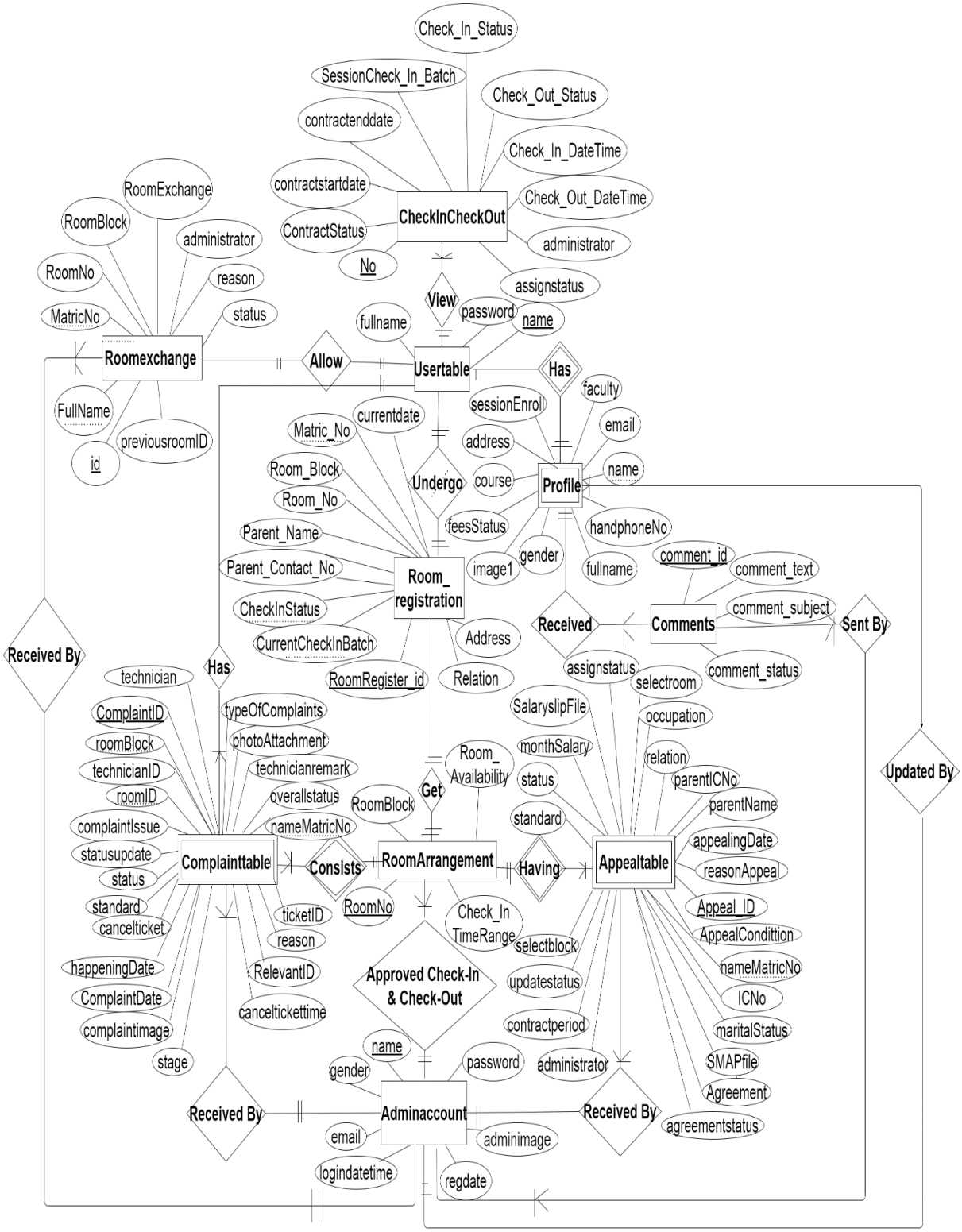
Appendix B

Data Flow Diagram (DFD) (Level 0)



Appendix C

Entity Relationship Diagram (ERD)



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