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Ivory Inn Room Reservation System

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Abstract
The Ivory Inn Room Reservation System aims to transform traditional reservation methods, addressing inefficiencies that lead to customer dissatisfaction and operational challenges. This web-based platform offers an intuitive and responsive interface, enabling users to make reservations across multiple devices. Developed on the Windows platform, the system successfully established a connection with external facilities during testing, allowing real-time user interaction. The developed system significantly reduces the time and effort required for accommodation reservations, enhancing customer satisfaction and operational efficiency for hoteliers.

1. Introduction

The hotel industry is a business that provides hospitality services to customers such as travelers, foreigners, businessmen, tourists, and visitors. It creates socio-economic opportunities for both owners and customers [1]. Utilizing a manual system could lead to an increase in errors due to people forgetting and having limited thinking processes. Hence, using a computerized system today is more efficient and advantageous. An efficient reservation system must incorporate cutting-edge technology to enable hoteliers to gain a competitive edge over their competitors and stay at the forefront of emerging trends [2]. This method also enables hoteliers to manage reservations from various sources through a single control system and allocate accommodations favorably to various online channels [2].

This case study focuses on the Ivory Inn, the main accommodation facility situated at Politeknik Muadzam Shah, Pahang. The hotel currently uses a manual reservation system to manage room reservations. The existing process is paper-based and uses spreadsheet software to document reservation information. Guests initiate room reservations by phone or walk-in request, and hotel staff are responsible for managing this information. First and foremost, room reservation processes tend to be time-consuming, leading to delays and potential frustrations for guests. Additionally, errors can occur, often due to miscommunication during phonereservations or data entry mistakes by hotel staff.

Therefore, Ivory Inn's room reservation system is designed as a web-based platform that effectively manages and streamlines the processes related to hotel room reservations in an orderly and reliable manner. This modern approach allows guests to leverage their personal devices and technology for booking activities, optimizing efficiency for both guests and hotel staff. Through this system, guests can easily initiate room reservations, modify reservations according to their preferences, and submit reservation change requests through an online platform. Additionally, a good hotel reservation system can help hotels streamline their booking processes, save time and costs, and increase guest satisfaction [3].

2. Related Work

Comparative studies were conducted on three related systems to the proposed system. the first system is Sunway Putra Hotel [6] uses a reservation system to operate its hotels in Malaysia. The system allows you to search by availability, price, and select preferred reservation dates. We also offer a flexible online reservation system that allows changes to be made outside of business hours. The system also provides an important pop-up message that asked guests to enter a valid email address to receive updates and notifications about special discounts and promotions. This system allows guests to book at lower prices and receive notifications about special offers.

The second system is Swiss-Garden Hotel Melaka [8], located in Malacca, offers a modern, upscale atmosphere with an ancient feel. Its official website allows guests to make online reservations at any time and place, with theoption to make changes or update the website. The website also features a popup message when the website encounters problems or is under maintenance, providing contact numbers and other important information. Guests can check room availability and price details, choose check-in and check-out dates, and view prices before and after discounts for each room category.

The third system is Hotel Kobemas Melaka, an online hotel reservation system that offers flexible booking options at any time and place. It features a simple interface, displaying all reservation processes in one page. Guests can check room availability and price, and make payments by signing up or logging in. The system also includes currency conversion, making it easier for foreign tourists to understand the required payment amount.

The newly developed system is the Ivory Inn Room Reservation System offers a flexible online reservation system for guests, allowing them to make reservations outside normal working hours. It also provides efficient record keeping and simplifies hotel staff work. The system allows guests to search, sort, and reserve rooms according to their preferences, save favorites, and make reservations later. It features a user-friendly interface, supports multiple devices, and automatically updates reservation details without contacting staff. The recommended approach is a convenient alternative to the traditional room reservation process at Ivory Inn.

2.1 Comparison with the Existing and Proposed System

The comparison between three related systems was simplified in Table 1.

Table 1 System's comparison

Module and Function	Sunway Putra Hotel	Swiss-Garden Hotel Melaka	Hotel Kobemas Melaka	Ivory Inn
User Login Function	Yes	No	No	Yes
Register Account Function	Yes	No	No	Yes
Room Reservation Function	Yes	Yes	Yes	Yes
Review and Rating Module	No	No	No	Yes
Notification Module	Yes	Yes	Yes	Yes
Payment Module	Yes	Yes	Yes	Yes

3. Methodology/Framework

The prototyping model, being an iterative strategy, not only facilitates the early collection of user feedback but also enhances the comprehension of system requirements, leading to a refined outcome. This approach allows for swift adjustments, providing rapid feedback and minimizing the risk of delivering a non-viable software product [4]. In the dynamic hospitality sector, characterized by rapid changes in guest expectations and market trends, the adaptability of the prototype model proves invaluable, ensuring that the developed software aligns seamlessly with evolving industry dynamics and customer preferences. Table 2 shows software development phases and its activity.

Table 2 Software development activities and their deliverables

Phase	Task	Output
Planning	Conducted a thorough analysis of the existing manual reservation system to identify gaps and define new features. Created a project proposal and developed a Gantt Chart to outline the project timeline.	1. Project proposal 2. Develop Gantt Chart

Table 2 (cont).

Analysis	Identify the system's main functions, data flow, and specifications for both hardware and software. Developed Use Case, Activity, Sequence, and Entity Relationship Diagrams (ERD) to visualize system requirements.	1. Use case Diagram. 2. Activity Diagram 3. Sequence Diagram 4. Entity Relationship Diagram (ERD) 5. Hardware and Software Requirements
Design	Developing the entire architecture and designing process such as user interface and database schema.	1. User interface of the system 2. Flowchart
Prototype Development	involves creating a functional prototype of the Ivory Inn room reservation system, allowing for a tangible representation of the project's concept.	The Ivory Inn room reservation system functional prototype.
User Evaluation	The evaluation process would involve collecting user feedback and determining prototype usability.	User feedback reports and evaluations of the prototype.
Testing	Performing different types of tests such as unit, integration, system, and user acceptance tests.	A well-tested system free of any identified and resolved issues.

4. System Analysis and Design

System analysis involves illustrating the data flow and processes in the developed system through a variety of techniques. Different methods used to visually portray the developed system include use case diagrams, sequence diagram, activity diagram, class diagram, flowchart, and entity-relationship diagrams (ERDs) [5]. The reason for utilizing these methods is to visually illustrate intricate systems that are challenging to describe through text. UML diagrams like Use Case Diagram, Activity Diagram, Sequence Diagram, and Class Diagram are produced using the object-oriented approach [5]. By visualizing every component of a system, it becomes simpler to pinpoint and fix defects, resulting in the creation of a strong system. Moreover, a system analysis involves analyzing requirements to establish specifications for the system. System requirements include a functional requirement in Table 3 and a non-functional requirement in Table 4.

Table 3 Functional Requirements

No.	Modules	Explanation
1.	Registration and Login Module	• The system should allow new users to register accounts and provide login credentials, including email and password. • The system should allow guest login using email and password, while allowing admin and staff to access the system with a user ID and password.
2.	Room Catalogue Module	• The system should allow guests to choose their preferred check-in and check-out dates and indicate the number of guests to narrow down their room choices. • The system should allow guests to browse and search for rooms based on their desired amenities, room type, and other preferences. • The system should allow guests to choose the room that best suits their needs and proceed with the booking process. • The system should notify the user if the rooms are unavailable due to under maintenance or the rooms are fully booked.
3.	Reservation Module	• The system should allow guests to reserve a room only if it is available and not previously booked by another guest. • The system should allow facilitate seamless transfer of booking information to the receptionist for database recording. • The system should allow generate and send a booking confirmation notice to users upon the successful completion of their reservation.

Table 3 (cont).

5.	Reviews and Ratings Module	• The system should allow guests to give review and rating based on cleanliness, service, and facility. • The system should allow the administrator to approve, edit or remove reviews that violate the platform's policies.
6.	Report Module	• The system should allow the admin to generate and view the hotel daily report of the overall activities such as hotel booking history, financial summary, occupancy rates and guest details. System displays error if the wrong input is inserted. • System will redirect to the main page when successful
7.	Management Module	• The system should allow administrators to set up and display special promotions or advertisements for the hotel. • The system should allow the administrator to update anything related to booking system, such as updating and adding more room details, updating new room into the system and delete features or any details related.

Table 4 Non-Functional Requirements

No.	Requirement	Explanation
1.	Performance	The loading time required for a website is no more than 5 minutes.
2.	Operational	• The system should be able to be used anytime. • The system should be user-friendly. • The system should be easily maintained and updated. • The system should be able to work on any web browser.
3.	Security	• The system should be user-friendly. • The system should only allow admin to generate and view the report. • The system should only allow all users to access their own account with user email and password.
4.	Cultural and political	The system should not contain any icons that could be considered offensive in any market country

4.1 Use case diagram

Figure 1 shows the use case diagram that represents the overall activity of the Ivory Inn Room Reservation System. The use case includes an online hotel reservation system for stakeholders which are guests and hotel staff. Use cases include information queries, reservations or updates, hotel payments, reservation cancellations, and hotel information updates. The system is modeled using use case diagrams that show the relationships between these use cases and actors.

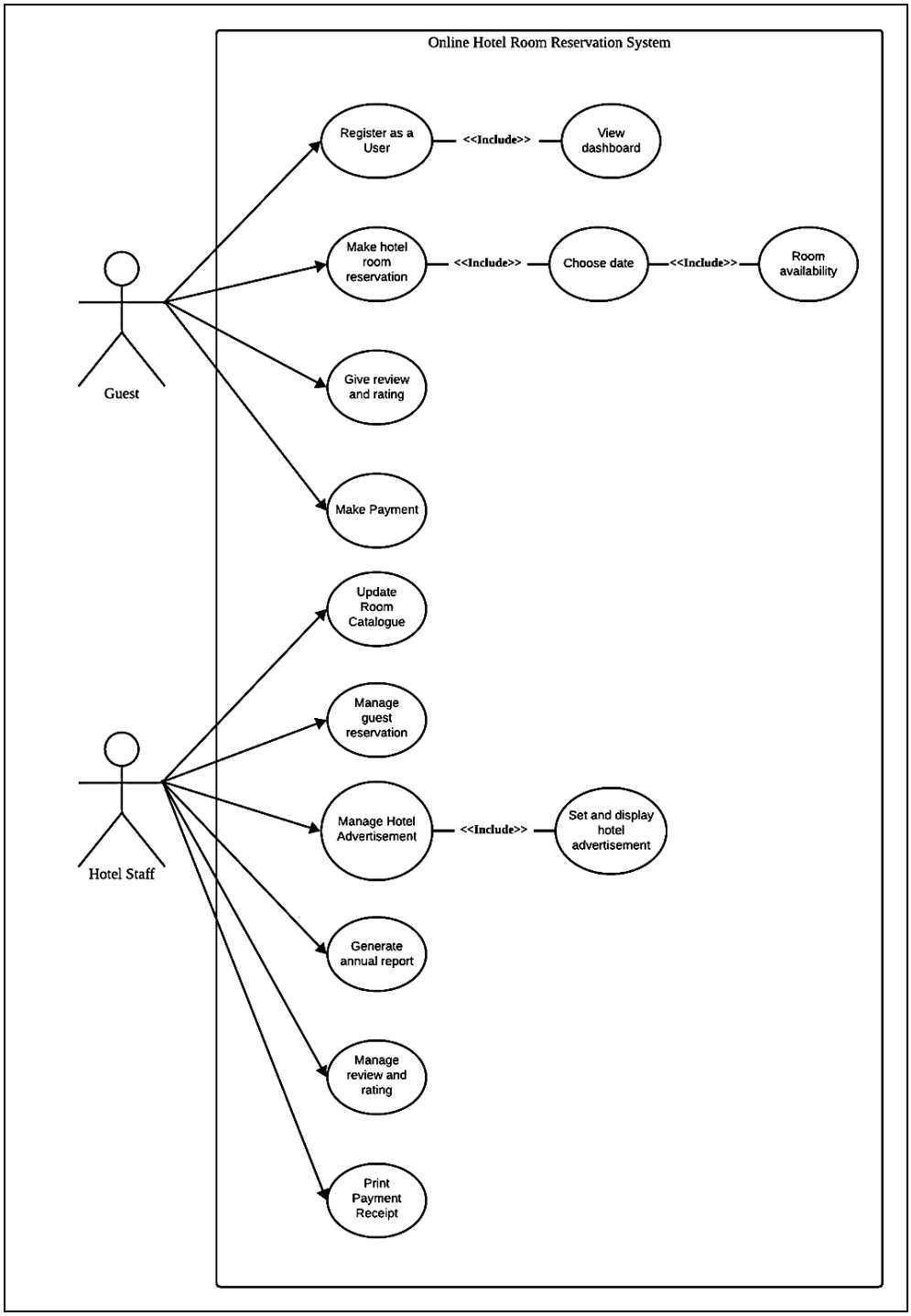

Figure 1: Use case diagrams

4.2 Sequence Diagram

Figure 2 shows the sequence diagram for Administrator while Figure 3 shows the sequence diagram for Guest of the proposed system. A sequence diagram for an online hotel room reservation system shows the step-by-step interactions between the user and the system throughout the room reservation process. It starts with a user login where credentials are verified, queries the database to check room availability, and provides real-time information to the user. In the payment phase, the user selects a room, confirms the reservation, and initiates the payment. The system interacts with payment gateways for transaction processing. The system will then update the reservation status and notify the user. After a stay, the system records feedback and updates the database, giving users the opportunity to review and rate their experience.

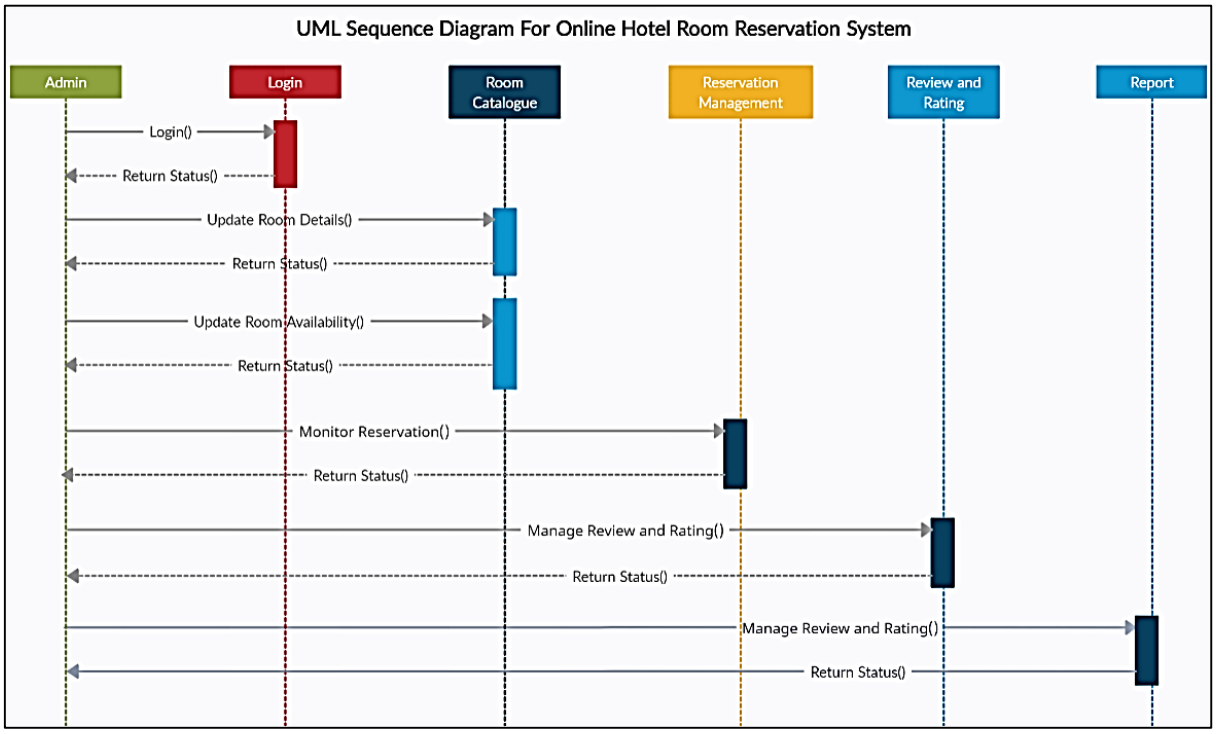

Figure 2: Sequence Diagram for Administrator

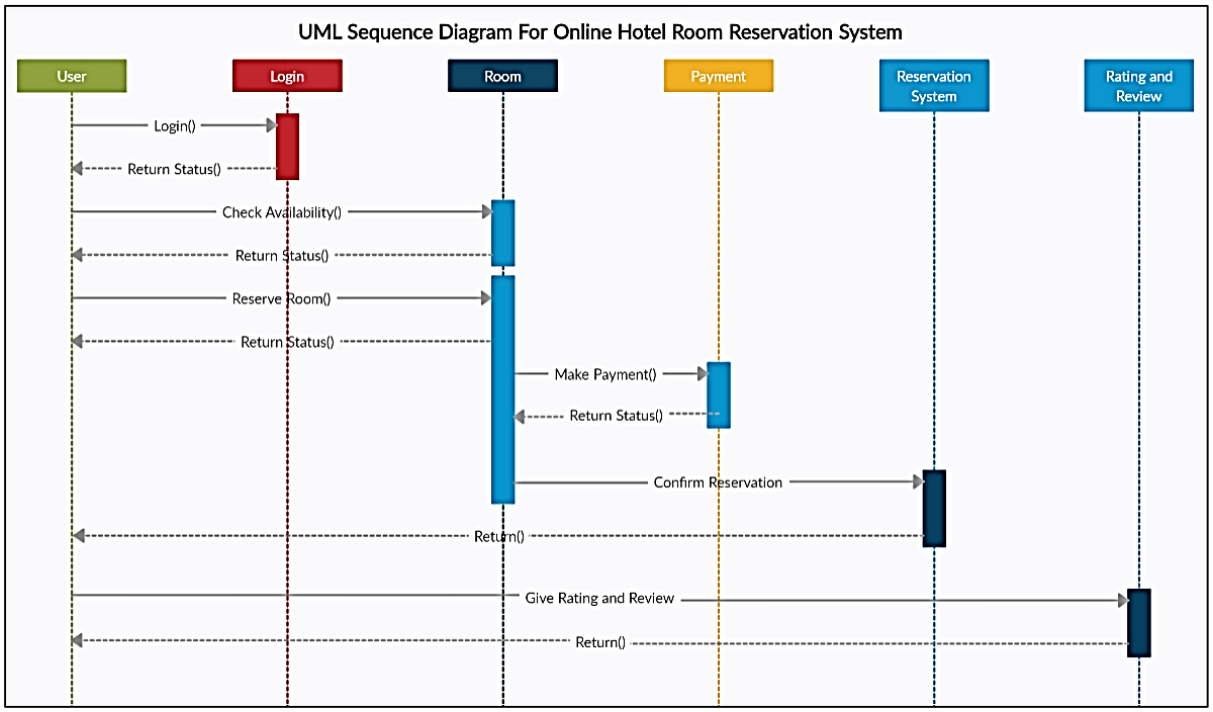

Figure 3: Sequence Diagram for Guest

4.3 Activity Diagram

An activity diagram for an online hotel room reservation system serves as a highly efficient operational diagram, clearly representing the dynamic interaction amongst the guests and the system. Figure 4 shows an activity diagram for an online hotel room reservation system that serves as a highly efficient operational diagram, clearly representing the dynamic interaction between the system and the guest shows activity diagram that further explains the key concepts of a hotel room reservation system and provides valuable insights for programmers to improve their understanding of the system's complexity and implementations.

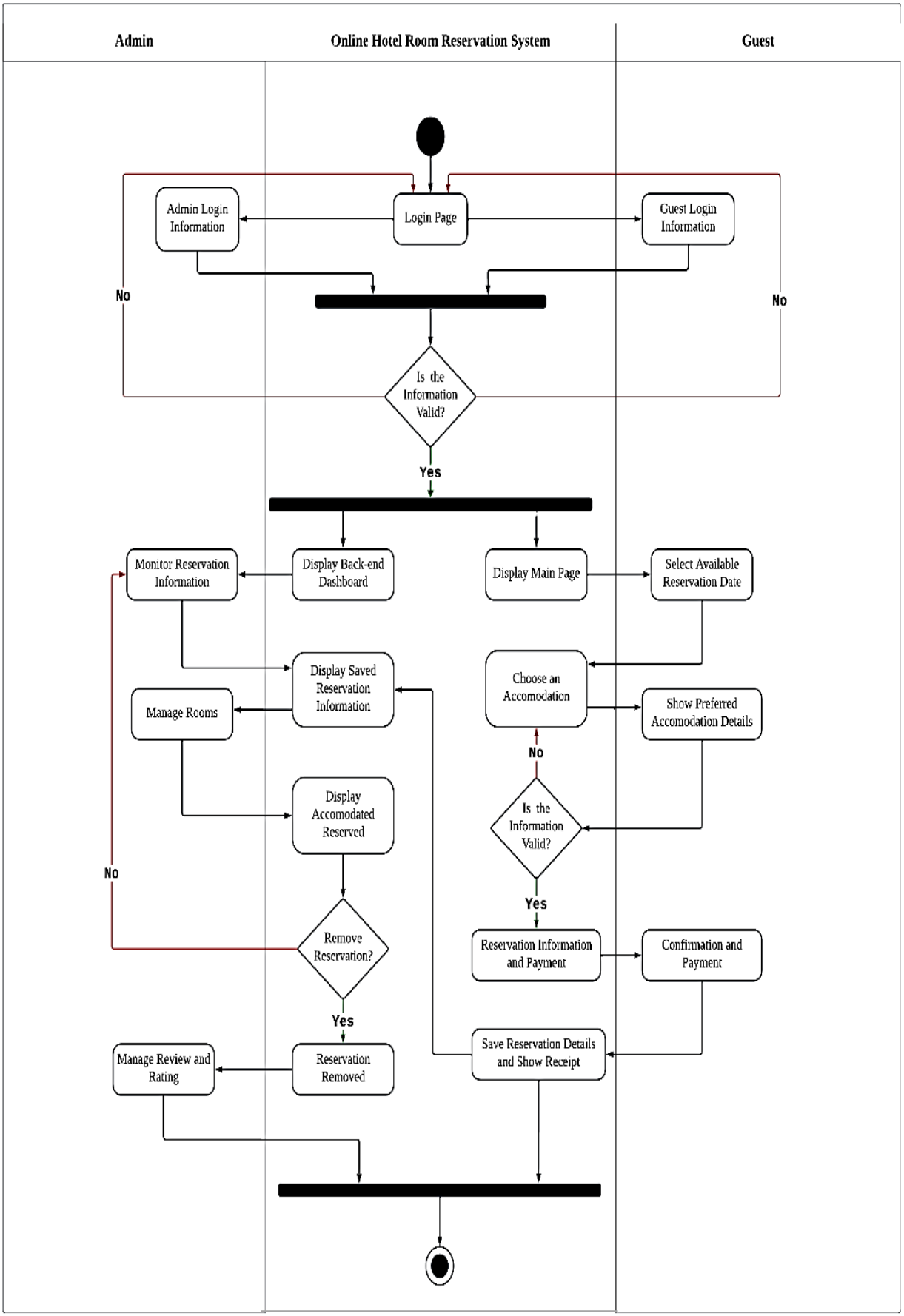

Figure 4: Activity Diagram

4.4 Entity Relationship Diagram (ERD)

Figure 5 shows the Entity Relationship Diagram (ERD) of the proposed system. The Entity Relationship Diagram (ERD) is a crucial tool for hotel online reservation systems, illustrating the structure of the system. It consists of eight main entities: Guest, Account, Staff, Rate, Payment, Reservation, Room Type, and Room. Each entity is defined by attributes, highlighting its role and connection within the reservation ecosystem. The central entity, Payment, connects to guest, rate, reservation, room, and staff entities, ensuring secure data handling. The diagram also links guests and rooms, providing a comprehensive overview of booking details. ERD is essential for designing and troubleshooting relational databases, focusing on data security for efficient transaction management, reporting, and inventory management.

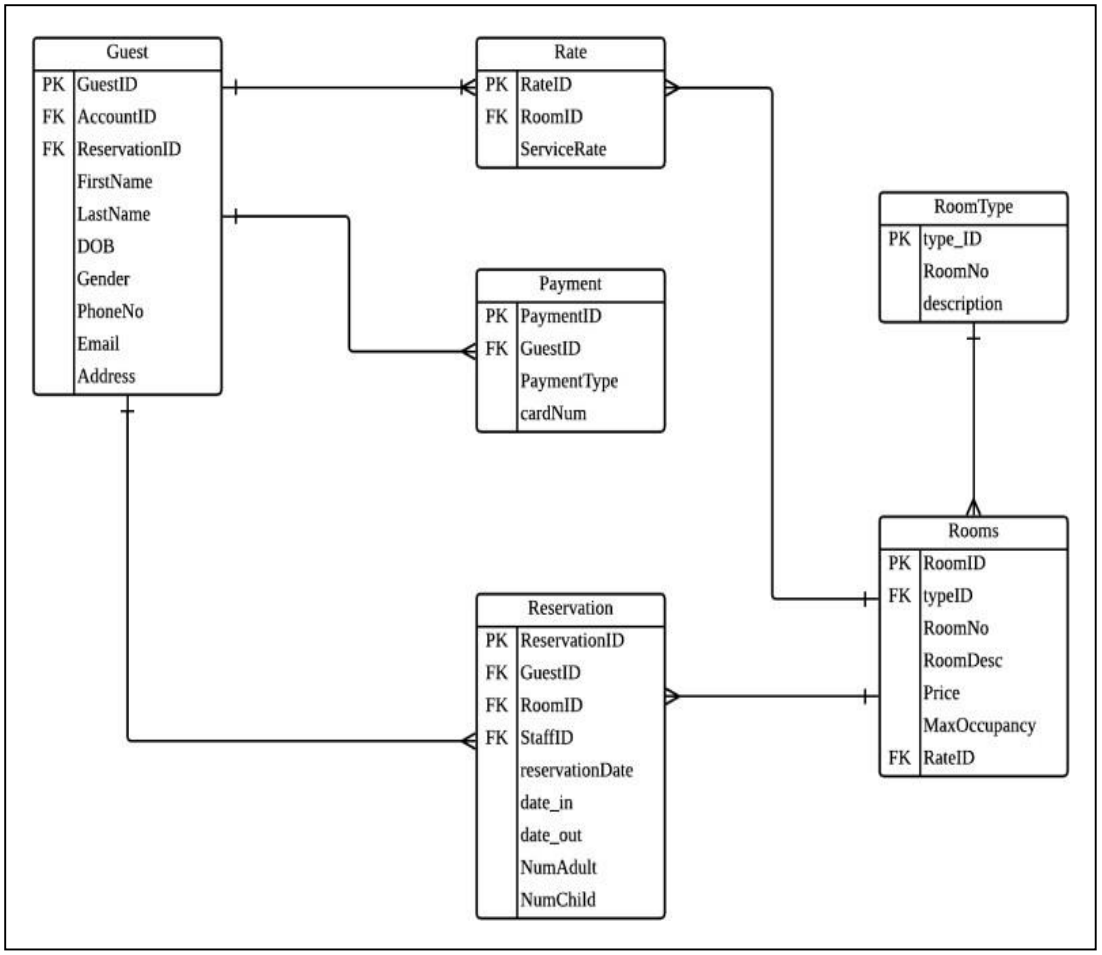

Figure 5: Entity Relationship Diagram (ERD)

4.5 Flowchart

Figure 6 shows the administrator and guest flowchart process. Admin tasks involve inserting data, verifying accounts, managing room information, updating statuses, printing receipts, and adding reports. The Reservation System handles guest registration, login, room selection, payment, and logout. Guests create and check their info, view room availability, and complete payments. The design ensures a smooth process, allowing guests to easily reserve rooms and admins to efficiently manage data, contributing to a pleasant experience for guests at The Ivory Inn. The flowchart illustrates the streamlined online reservation system.

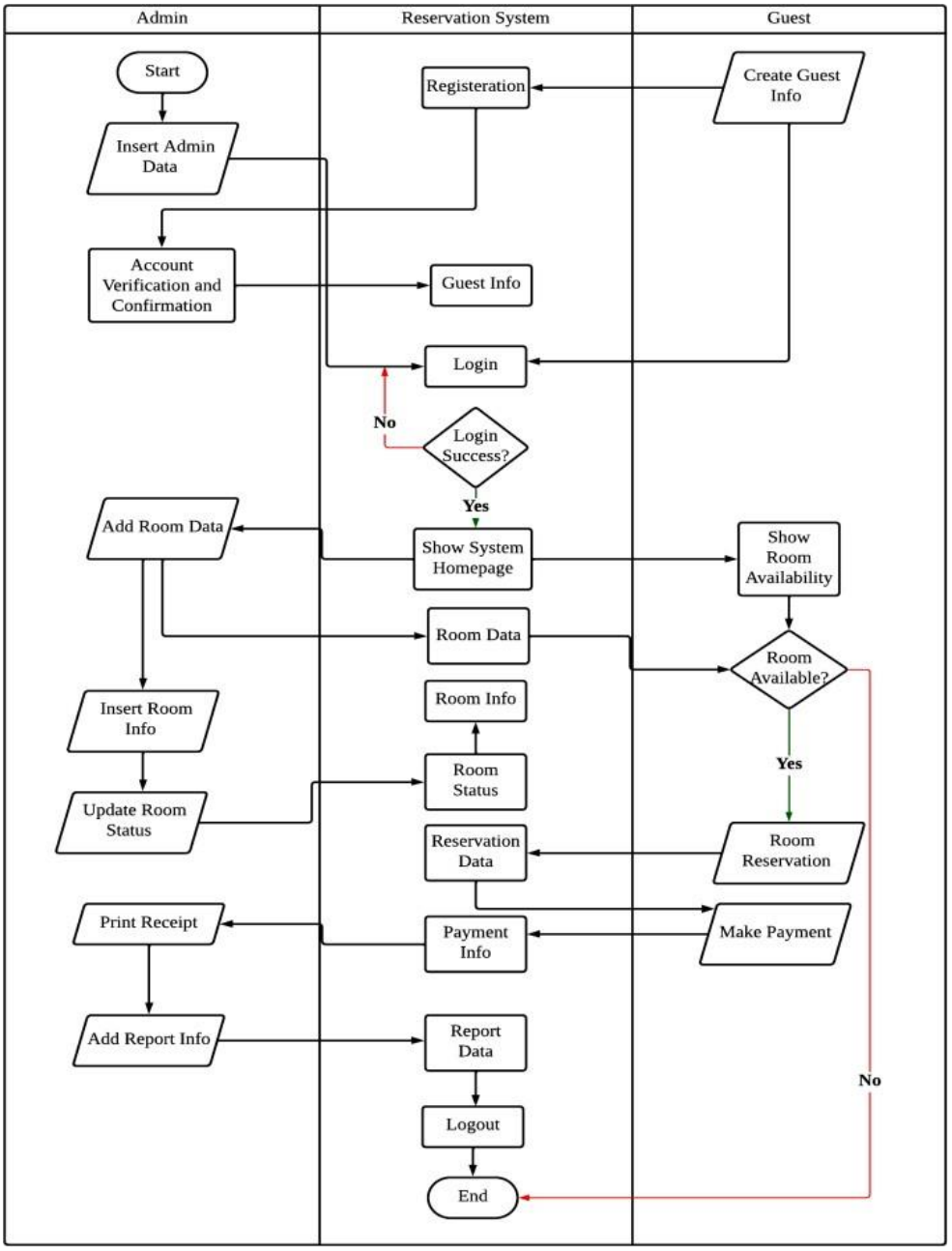

Figure 6: Flowchart

4.6 Interfaces Design

In the crucial design phase, the primary focus is on carefully creating a system that accurately fulfills the requirements determined in the prior analysis phase. The thorough requirements identified in the requirements analysis phase act as a roadmap for this transformation process. This change is described in a detailed system design document that acts as a high-level plan, outlining the design, layout, and parts of the system being suggested. Using these design elements to visualize the system helps stakeholders grasp the project's structure and functionality fully prior to moving on to the coding phase. The design of the system user interface has been completed and can be seen in Figures 7-12.

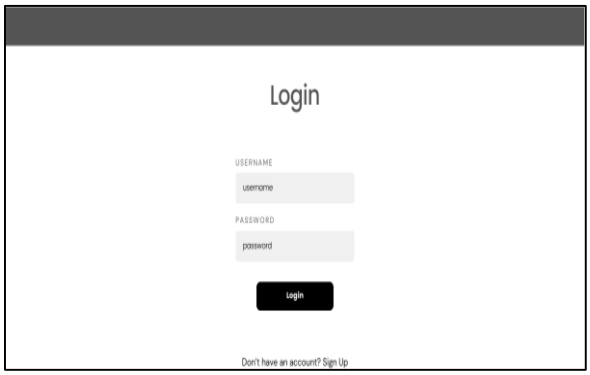

Figure 7: Login Page

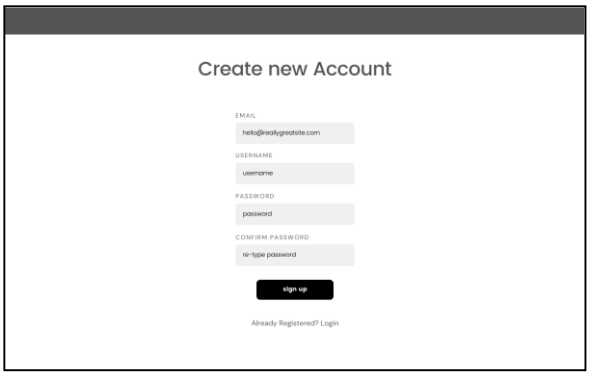

Figure 8: Registration Page

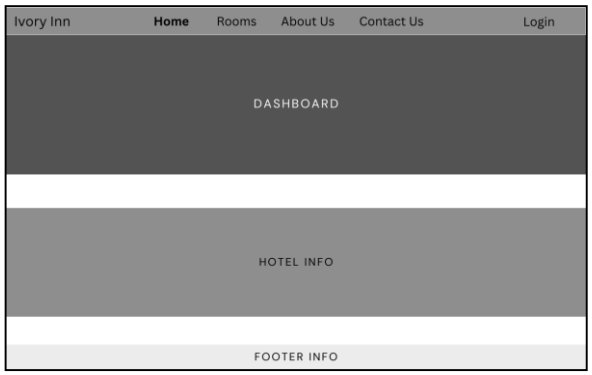

Figure 9: Homepage

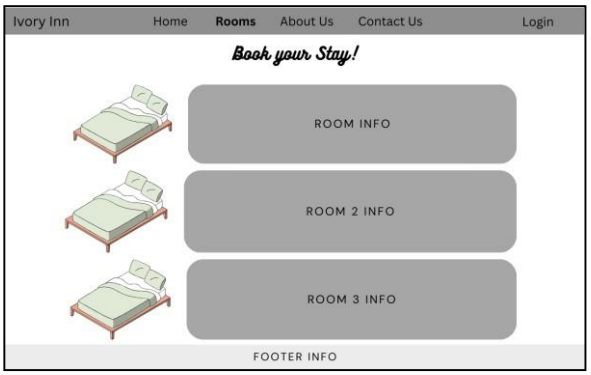

Figure 10: Room Catalogue Page

Figure 11: About Us Page

Figure 12: Contact Us Page

5. Result and Discussion

The implementation phase of the system development process focuses on building the system and verifying that it fulfills quality criteria. This includes programming the system and creating the appropriate database. The basic purpose of system testing is to guarantee that the system is error-free and meets user expectations. Before the system is completely distributed to all users, it is first tested with a selection of them. This chapter covers the three general stages of testing, unit testing, system integration testing, and overall system testing.

5.1 System Implementation

The process of implementation involved creating the prototype system using the user requirements that were analysed and designed. The primary focus during this phase was developing the prototype system through coding. During this stage, two prototype systems were created simultaneously, the Ivory Inn Room Reservation System as the front-end system, and the Ivory Inn Management System as the back-end system. MySql server was utilized to set up a local host for displaying the system that was built. In addition, the prototype system was developed using five primary programming languages including HTML, CSS, PHP, MySQL, and JavaScript. The explanation of the partial functional coding for each module can be found in the subsections that follow.

5.2 Login Interface for Guest

Figure 15 demonstrates the system interface for guests to sign in, requiring them to accurately enter their username and password. If login is successful, a confirmation message is displayed, if unsuccessful, guests are asked to enter their details again. Figure 16 shows the code snippet that verifies if the action is "login" and gets the user-entered email and password from the POST request. It builds and runs a query to authenticate the credentials with the user table. If the user's credentials are confirmed, it initiates a session and directs them to search.php. If not, it displays an error message and redirects to the login page after a short delay.

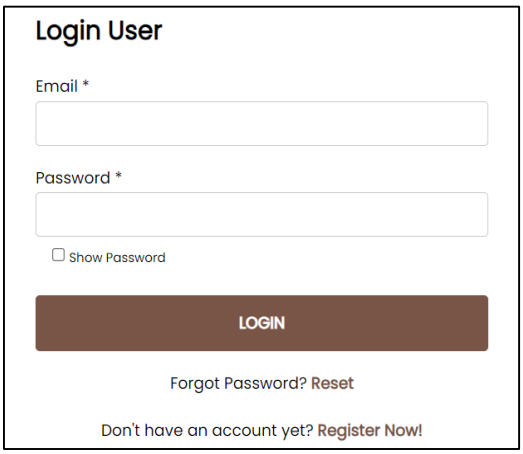

Figure 15: Guest Login Page

```php
if($act == "login")
{
    $email      = (isset($_POST['email'])) ? trim($_POST['email']) : '';
    $password   = (isset($_POST['password'])) ? trim($_POST['password']) : '';

    $SQL_login = " SELECT * FROM `user` WHERE `email` = '$email' AND `password` = '$password'  ";

    $result = mysqli_query($con, $SQL_login);
    $data   = mysqli_fetch_array($result);

    $valid = mysqli_num_rows($result);
```

Figure 16: Guest Login Page Source Code

5.3 Login Interface for Hotel Administrator

Hotel Administrators are able to log in to the system for the administration module by inputting the username and password. Figure 17 displays the login interface designed exclusively for administrators. Figure 18 shows This PHP code manages the admin login procedure by checking if the username and password match the records in the admin table of the database. After successfully verifying the identity, it saves the admin's login credentials in the session and sends them to the primary admin page. If the authentication is unsuccessful, an error message is displayed, and the user is redirected to the login page.

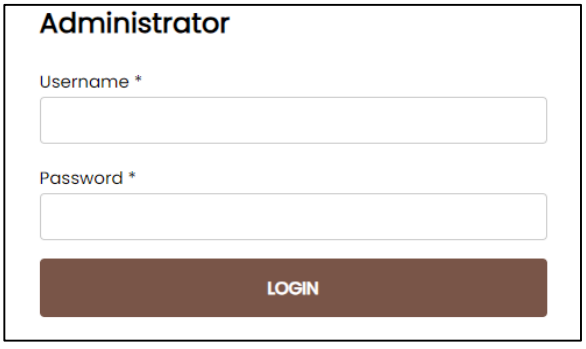

Figure 17: Administrator Login Page

```php
if($act == "login_admin")
{
    $username   = (isset($_POST['username'])) ? trim($_POST['username']) : '';
    $password   = (isset($_POST['password'])) ? trim($_POST['password']) : '';


    $SQL_login = " SELECT * FROM `admin` WHERE `username` = '$username' AND `password` = '$password'  ";

    $result = mysqli_query($con, $SQL_login);
    $data   = mysqli_fetch_array($result);

    $valid = mysqli_num_rows($result);
```

Figure 18: Administrator Login Page Source Code

5.4 Room Catalogue Module

The Room Catalogue module enables guests to explore and view the rooms that are currently available at the Ivory Inn. The Room Catalogue interface in Figure 19 displays detailed information on each room, such as descriptions, amenities, and pricing, for guests to view by room categories. Guests have the option to choose rooms according to their likes. Figure 20 shows room catalogue code snippet that The PHP code uses an SQL query to fetch data from the `room_type` table and then iterates over each row using a `while` loop. For every entry, it selects the `photo` and `id_room_type` information, providing a standard image name if the `photo` information is missing. The value of `id_room_type` is saved for future processing. illustrates the code segment responsible for managing the Room Catalogue to help guests in finding and choosing accommodations that meet their requirements effectively.

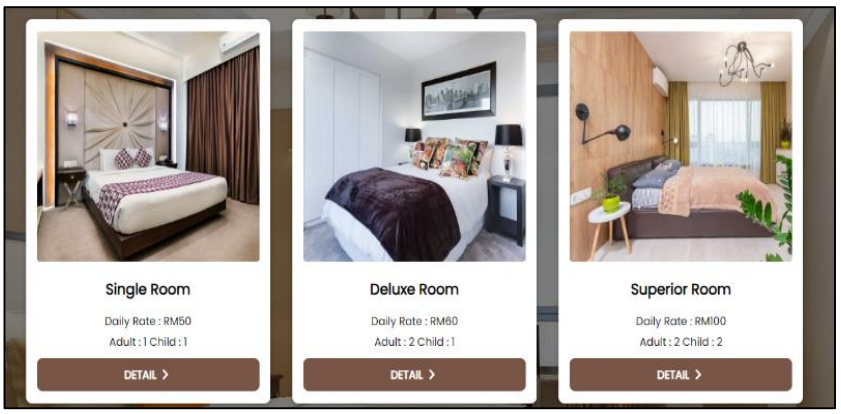

Figure 19: Room Catalogue Page

```php
<?PHP
$SQL_list = "SELECT * FROM `room_type` ";
$result = mysqli_query($con, $SQL_list) ;
while ( $data    = mysqli_fetch_array($result) )
{
    $photo  = $data["photo"];
    if(!$photo) $photo = "noiamge.png";
    $id_room_type   = $data["id_room_type"];
?>
```

Figure 20: Room Catalogue Page Source Code

5.5 Reservation Module

The Reservation Module allowed guests to reserve hotel rooms online through the Ivory Inn Room Reservation System, eliminating the need to visit the hotel in person. Visitors could confirm room availability by giving the

dates for check-in and check-out, making sure that rooms were available. The system presented guests with information on the room availability, type, amenities, and prices, helping them make informed choices. Reservations were confirmed when guests inputted their personal and payment information into the system.

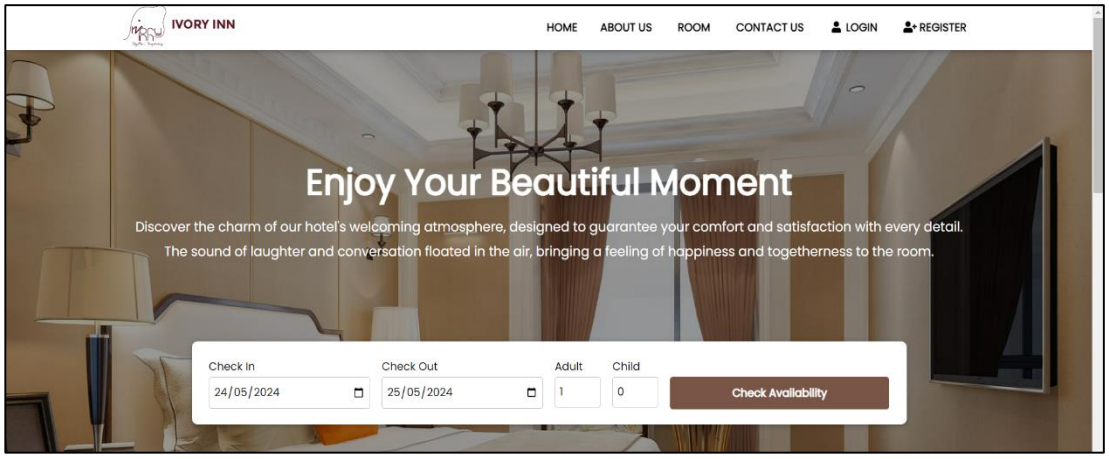

Figure 21: Check Room Availability

Figure 21 illustrates the interface for guests to make reservations. Guests have to enter preferred check-in and check-out date, number of adult and children included. Next, guests must click 'Check Availability' button to view the available room based on the check-in and check-out.

```php
<?PHP
$checkin    = (isset($_POST['checkin'])) ? trim($_POST['checkin']) : date("Y-m-d");
$checkout   = (isset($_POST['checkout'])) ? trim($_POST['checkout']) : date("Y-m-d", strtotime("+1 day"));;
$adult_find = (isset($_POST['adult_find'])) ? trim($_POST['adult_find']) : 1;
$child_find = (isset($_POST['child_find'])) ? trim($_POST['child_find']) : 0;

$date = strtotime('+1 day', strtotime($checkin));
$min_checkout = date('Y-m-d', $date);
?>
```

Figure 22: Check Room Availability Source Code

Figure 22 shows PHP code processes a hotel reservation by linking to a database and gathering user inputs such as availability status, room type ID, check-in and check-out dates, and the total number of rooms. It computes the earliest possible check-out date, fetches details about the room, and determines the total expense.

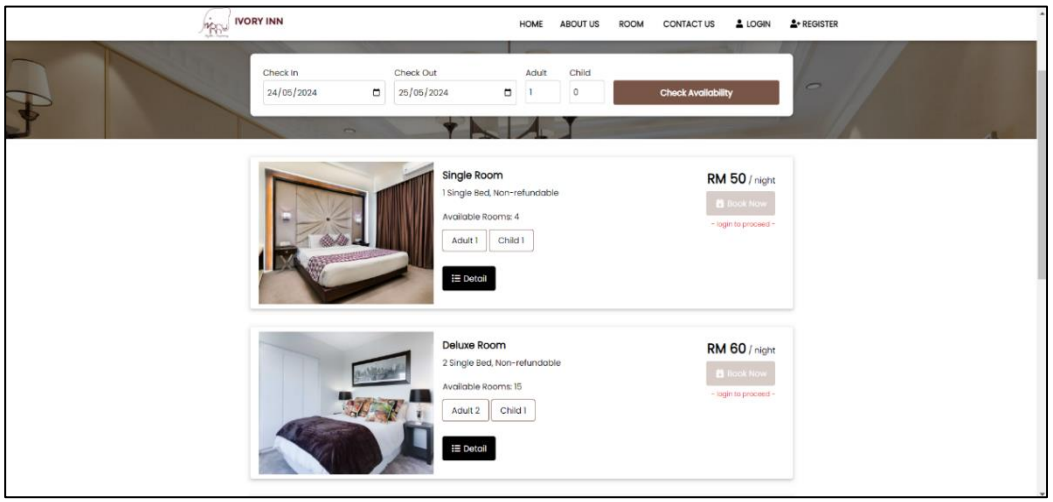

Figure 23: Display Room Availability

Figure 23 shows the interface that displays the available room based on details that guests have entered. Before a guest wants to make reservation by clicking on 'Book Now' button, guest have to login first to proceed the reservation process.

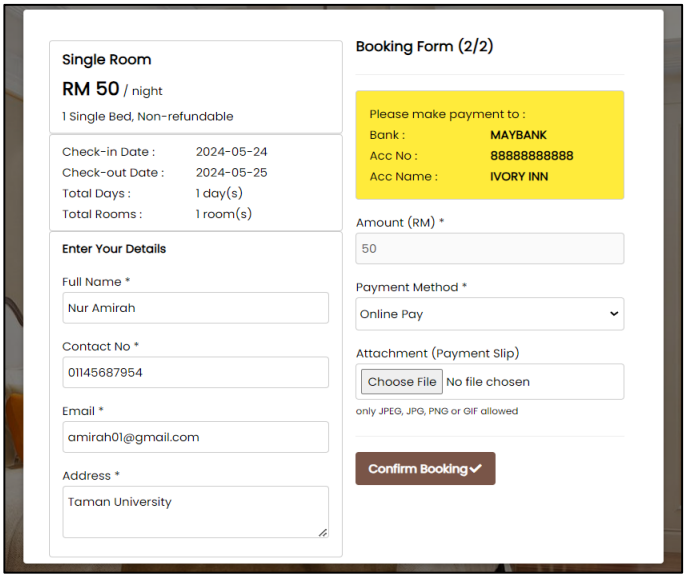

Figure 24: Room Reservation Process

Figure 24 shows the reservation process that guest have to enter some details such as Address and Payment Slip attachment.

```
$SQL_view    = " SELECT * FROM `room_type` WHERE `id_room_type` =  $id_room_type ";
$result      = mysqli_query($con, $SQL_view) or die("Error in query: ".$SQL_view."<br />".mysqli_error($con));
$data        = mysqli_fetch_array($result);
$price       = $data["price"] + 0;
$photo       = $data["photo"];
if(!$photo) $photo = "noimage.jpg";

$datetime1 = date_create($checkin);
$datetime2 = date_create($checkout);
// Calculates the difference between DateTime objects
$diff = date_diff($datetime1, $datetime2);

$total_day = $diff->days;

$total_amount = $price * $total_room * $total_day;

$SQL_user    = " SELECT * FROM `user` WHERE `email` =  '{$_SESSION['email']}' ";
$rst_user    = mysqli_query($con, $SQL_user) ;
$dat_user    = mysqli_fetch_array($rst_user);
?>
```

Figure 25: Room Reservation Source Code

Figure 25 shows the PHP script handles room bookings by choosing room categories, fetching price and image, and computing total cost depending on check-in and check-out dates. It retrieves information from the "user" table to obtain user details and then calculates the total cost by multiplying the price per day of the room by the number of days and rooms. This script is utilized to handle booking information and user details.

5.6 Management Module

In the management module, administrators can make changes to room information by using the appropriate login credentials. Administrators have complete control to oversee all information regarding rooms by categories, including updating the room availability.

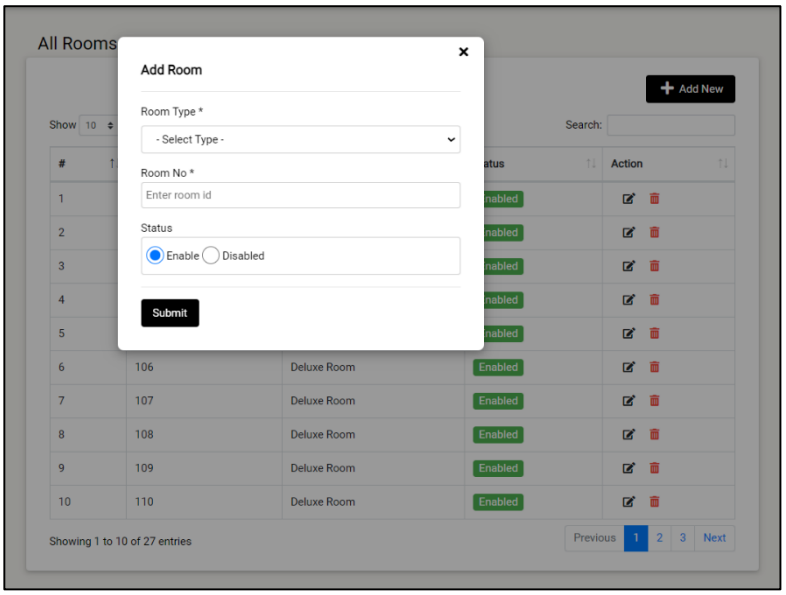

Figure 26: Room Management Module for Administrator

Figure 26 illustrates the room management module for administrator to add, remove or edit the room status, room status are divided into two categories that are 'Enable' and 'Disable'. 'Enable' status to indicate that the room is available to be displayed in the list while 'Disable' status refers to that the room are not available for few reasons such as in maintenance or no longer operates for reservation. Figure 27 shows PHP script carries out administrative functions to handle room records in a hotel management system. It manages tasks like adding a new room, modifying a room, and removing a room. It consists of checking and cleaning user input, verifying the user's admin rights, and generating relevant success or error messages according to the outcome of the operation.

```php
if($act == "edit")
{
    $SQL_update = "
    UPDATE
        `room`
    SET
        `id_room_type` = '$id_room_type',
        `room_no` = '$room_no',
        `status` = '$status'
    WHERE
        id_room = $id_room
    ";

    $result = mysqli_query($con, $SQL_update);

    $success = "Successfully Updated";
```

Figure 27: Room Management Module Source Code

5.7 Review and Rating Module

The module for review and rating enables guests to give their opinions on the services provided in the rooms. When guests select this category, the platform shows a review and rating form. Guests are able to provide a review and star rating, send in a written review, and have it saved by the system for later use and examination. Figure 28 shows the Review and Rating feature that allows visitors to express their thoughts and feedback on the amenities offered in the hotel accommodations.

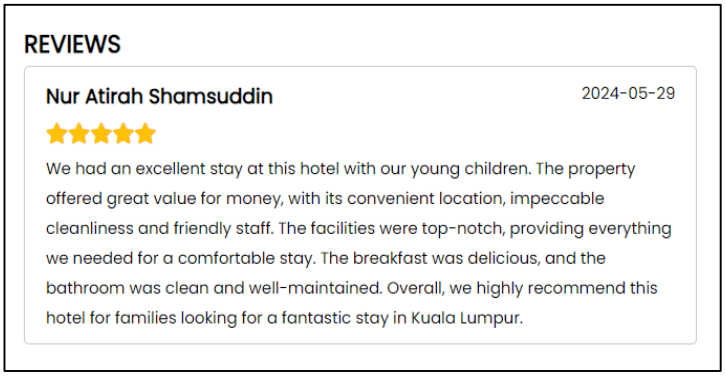

Figure 28: Review and Rating Module

```php
$act        = (isset($_REQUEST['act'])) ? trim($_REQUEST['act']) : '';
$name       = (isset($_POST['name'])) ? trim($_POST['name']) : '';
$rating     = (isset($_POST['rating'])) ? trim($_POST['rating']) : '';
$review     = (isset($_POST['review'])) ? trim($_POST['review']) : '';

$review     =   mysqli_real_escape_string($con, $review);

if($act == "addReview")
{
    $SQL_insert = "
    INSERT INTO `review`(`id_review`, `id_room_type` ,`name`, `rating`, `review`, `id_user`, `created_date`)
                VALUES (NULL, $id_room_type, '$name','$rating','$review', $id_user, NOW()) ";

    $result = mysqli_query($con, $SQL_insert);
}
?>
```

Figure 29: Review and Rating Source Code

Figure 29 shows piece of code manages the process of adding a new review for a specific type of room. Gathers user input for the review information, cleanses the review content, forms an SQL INSERT statement to insert the review into the review table, and runs the statement when the action is "addReview". This process guarantees the secure addition of review data to the database.

5.8 Testing

In this section, a thorough test will be carried out to evaluate how well each module in the system works. The evaluation of the system's performance and usability from the perspective of end-users will be done using the User Acceptance Test (UAT) method during the testing process. In the User Acceptance Testing (UAT) phase, real users, including guests and administrators, will complete specific tasks to confirm that the modules meet the necessary business specifications and are easy to use.

Table 5 Test Case for Login Module

No	Test Cases	Expected Result	Actual Result
1	Valid username and password	Redirect Guest to homepage.	As Expected
2	Invalid username and password	An error message will display “Error, invalid login, please try again”	As Expected
3	Empty credentials during login	An alert message “Please fill out this field” will display at the empty space	As Expected

Table 6 Test Case for Room Catalogue Module

No	Test Cases	Expected Result	Actual Result
1	View room catalogue details	Displays a list of all room types with detailed information, including descriptions, amenities, and pricing.	As Expected
2	View specific room details by clicking 'DETAIL' button	Displays detailed information of a selected room, including descriptions, amenities, and pricing.	As Expected
3	Hotel Administrators add new room type	Successfully adds a new room type with specified details (description, pricing, amenities).	As Expected
4	Hotel Administrators modify existing room details	Successfully updates the details of an existing room type (description, pricing, amenities).	As Expected
5	Hotel Administrators remove room type	Successfully removes the selected room type from the room type.	As Expected
6	Ensure database integrity	Database operations (add, modify, remove) are performed correctly and reflect accurate room details.	As Expected
7	Validate input data	Ensures all input fields are validated (non-empty, correct format) before submitting changes.	As Expected

Table 5 test case for Login Module that include scenarios for valid and invalid credentials and empty fields, all of which yielded the expected results. Successful logins directed users to the main page, unsuccessful logins showed an error message, and blank entries triggered a reminder to fill them out. Table 6 shows a list of the test cases for the Room Catalogue module, which include tasks like accessing room information and performing administrative functions like adding, editing, and deleting room types. These instances also secured the integrity of the database and validation of input data. The Room Catalogue module passed all tests successfully, confirming its functionality and reliability.

Table 7 Test Case for Room Reservation Module

No	Test Cases	Expected Result	Actual Result
1	Input Check-in and Check-out Dates	Users can choose dates for check-in and check-out to view available rooms	As Expected
2	Input Number of Adults and Children	Guests can specify the number of adults and children for the reservation	As Expected
3	View Available Rooms	Upon clicking 'Check Availability,' the system presents a list of available rooms based on the details provide by guest.	As Expected
4	Login Requirement	Before proceeding with reservation, guests are prompted to login to their account.	As Expected
5	Reservation Form - First Page	The initial reservation form shows the selected check-in and check-out dates and the total number of rooms selected.	As Expected

Table 7 (cont.)

6	Proceed to Second Page of Reservation Form	After clicking 'Next Proceed', guests are taken to the final page of the booking form to input address and payment information.	As Expected
7	Attach Payment Slip	Guests have the option to attach the payment slip as required.	As Expected
8	Complete Reservation	After filling out the reservation form, the system will show a Reservation Receipt to confirm the reservation.	As Expected

Table 7 shows the lists of test cases for the Room Reservation module, specifying different scenarios and their expected results, all of which were executed as planned. Individuals have the option to choose their check-in and check-out dates, indicate the quantity of adults and children, and see the rooms that are accessible according to these specifications. Guests are required to login to the system before making a reservation. The first booking form shows the chosen dates and room numbers correctly, and after that, guests are able to input their address and payment details. Furthermore, visitors can choose to include a payment slip, and once they finish filling out the form, the system will create a Reservation Receipt to verify the reservation.

5.9 User Acceptance Test

User Acceptance Testing (UAT) is an essential phase in the development process of a system, that required end-users or clients assess the system's performance and readiness prior to its functionality. Six participants were requested to give their opinions on the system's features and user interface for this system. A survey was created to assess their level of satisfaction and acceptability. The findings were examined and displayed graphically to offer a straightforward comprehension of user opinions.

Table 30 shows UAT results regarding user interface elements, whereas Figure 31 emphasizes the system's functions for stakeholders to evaluate strengths and areas needing improvement. This User Acceptance Testing ensures the system fulfills all criteria and is positively received by end users.

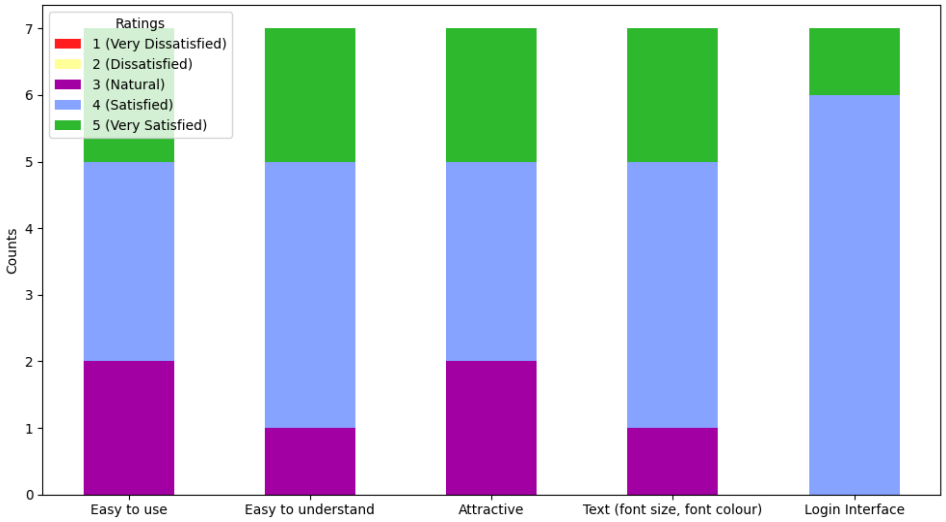

Figure 30: User Acceptance Testing for User Inreface

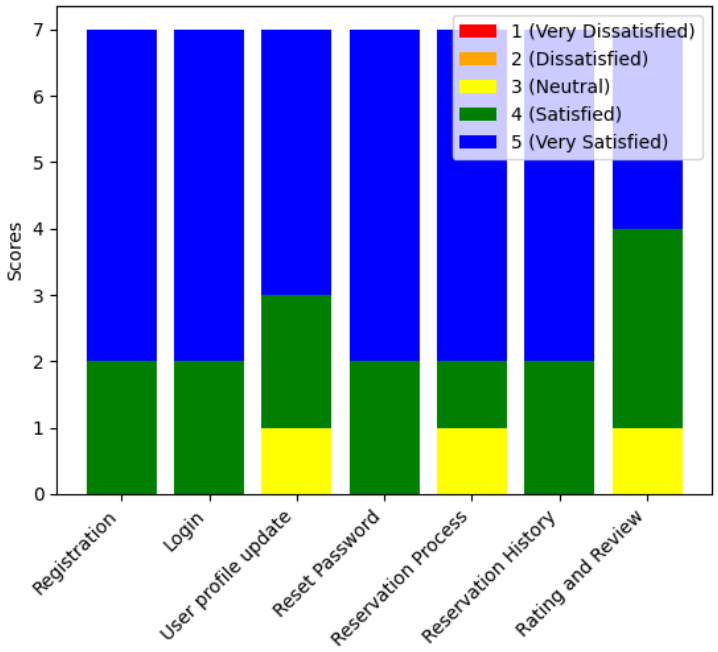

Figure 31: User Acceptance Testing for System Functionality

6. Conclusion

In conclusion, the Ivory Inn Room Reservation System represents a significant advancement for the hotel by replacing a manual, error-prone reservation process with an automated, web-based platform. The system offers numerous benefits, including reduced time and effort for both guests and staff, higher customer satisfaction through faster booking processes, and increased operational efficiency for the hotel. Key features such as user login, real-time room availability, online payment, and a comprehensive room catalog address the shortcomings of manual methods. The iterative prototyping approach ensured early user feedback and continuous refinement, resulting in a system that meets user needs and expectations. The successful implementation and testing of this system demonstrate its reliability and effectiveness, positioning the Ivory Inn competitively in the digital era of the hotel industry.

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Conflict of Interest

The authors declare that there is no conflict of interest regarding the paper's publication.

Author Contribution

Nur Fatihah Binti Khairil Azmi conducted the study conception and design, data collection, analysis and interpretation of results, and manuscript preparation, with Puan Rozlini binti Mohamed giving supervisory support and critical revisions to the manuscript.

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