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Development of a Web-based Reservation Management System for Walters Farm

Lee Jia Mei[1], **Norfaradilla Wahid**[1]*

[1] Faculty of Computer Science and Information Technology,
Universiti Tun Hussein Onn Malaysia, Parit Raja, Batu Pahat, 86400, MALAYSIA

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Abstract: Walters Farm Reservation Management System is a web-based platform developed for online ticket purchases and streamline booking services. It aims to address issues like manual ticket entry, staff shortages, and disorganized booking management. Based on the surveys collected from the customers, Walters Farm should implement digitalization to reduce manpower, boost business volume, and increase local tourism. The prototype model is used as the methodology model for this project. For implementation, the system is developed using PHP Laravel and MySQL as the database platform. Overall, Walters Farm Reservation Management System aims to streamline the booking process that can be improved with QR code technology to provide a functional platform for both customers and staff. Based on the functional testing, it is shown that the majority of the test plan's actual result for each module is successful. All respondents expressed satisfaction with the user interface and system functionalities.

Keywords: Reservation, management system, local tourism, digitalization, QR code

1. Introduction

Tourism sector is one of the important sectors in boosting the economic growth of Malaysia [1]. Tourism is the activity of people traveling and visiting other places far from home [2], and hospitality refers to the provision of services to welcome guests. Both tourism and hospitality are closely related to provide the tourists with a great travel experience. People nowadays would prefer to plan their trips in advance in a more convenient, faster, and safer way. Thus, Walters Farm Reservation Management System is developed to overcome the challenges faced by Walters Farm, a recently constructed tourist attraction in Segamat, Johor.

The main challenge for Walters Farm is they are still lacking an online platform for ticket purchase and services booking to facilitate their daily business. Currently, all the customers must queue up to buy tickets at the reception counter before being allowed to enter and enjoy the recreational parks. The second issue is due to the shortage of staff at the reception counter, which results in a long and time-consuming process during ticket purchasing. Manual handling of the entry tickets becomes another problem to Walters Farm, where each ticket must have the date manually recorded on it and be reviewed

*Corresponding author: faradila@uthm.edu.my

by the ticket collector. This causes the possibility of human error that might cost the organization money, time, and productivity. Additionally, an early booking or reservation can only be made through a direct call or WhatsApp with the person in charge of Walters Farm for other services including accommodations and private event venue booking which has increased the workload of employees. Using Google Sheets to record booking details and sales makes it difficult for the organization to organize the bookings and evaluate the total sales performance. From the problem statement, we can identify several project objectives as follows:

1. To analyze and design a web-based online platform for the users to purchase tickets, make reservations on accommodation and private event space.
2. To develop a user-friendly and efficient platform for both customers and administrators in ticket purchase and any other booking with QR technology.
3. To test the functionalities and usability of the developed system on the target users.

A few modules are developed for the reservation management system which include User Management Module, Ticket and Accommodation Reservation Module, Private Event Space Reservation Module, Payment Module, Schedule and Event Module, and Sales Report Module. With the system, the business manager and operational staff are authorized as the administrators to manage the tickets and reservations, track the sales' performance, edit the customers' details, update the latest event information. Hence, the system can ease their workload and improve the efficiency of their businesses without the need to hire more employees.

The rest of the paper is organized as follows. Section 2 describes the related works on tourism and digitalization, online reservation management system, QR code technology, and the review between the existing systems and the developed systems. Section 3 describes the methodology used to develop the system, the development workflow, and the analysis and design of the system. Section 4 of this paper describes the results and discussion, which presents the implementation and testing to validate the actual output of the developed system. Following that, Section 5 concludes the discussion by presenting future suggestions, improvements, and recommendations.

2. Related Works

2.1 Tourism and Digitalization

Tourism can be defined as leisure or business travelling when the individuals staying in places outside their typical surroundings for leisure for no more than one year and for no fewer than 24 hours for business or other objectives [3]. It is important to strengthen the domestic tourism by upgrading service quality of tourism staff and implementing digitalization such as e-wallet, e-booking etc [3].

2.2 Online Reservation Management System

An online reservation system is a web-based software system that manages reservations [4]. With the increase in digital literacy among customers after the post-pandemic, the use of online booking systems, especially ticket booking systems, has become more widespread. A reservation management system helps provide centralized control for managing everything in one place. To prioritize the customer experience, companies need a computerized reservation system for handling reservations and ensuring that processes such as presenting information, booking, and payment are consolidated to prevent manual error.

2.3 QR Code Technology

A Quick Response (QR) Code is a two-dimensional digital data storage that encodes and retrieves information quickly. Introduced in 1994 by DENSO WAVE in Japan, it stores data vertically and horizontally, allowing it to carry up to 7,089 characters at time [5]. Compared to traditional barcodes, QR Codes have a smaller printout size but can encode the same amount of data in one-tenth of the space.

They can be read from any direction and are commonly used to store ticket booking details [6] and protect sensitive data through e-authentication [7].

2.4 Study of Existing System

Three similar systems are selected for the study. The systems include Farm in The City Booking System [8], Labis Sunrise Farm Reservation System [9], Desa Dairy Farm Online Ticketing System [10] and Walters Farm Reservation Management System. A comparison of the existing systems and the developed system is shown in Table 1.

Table 1: Comparison table between similar systems and the developed system

Features / System	Farm In the City Booking System[8]	Labis Sunrise Farm Reservation System[9]	Desa Dairy Farm Online Ticketing System[10]	Walters Farm Reservation Management System
Platform	Web-based	Web-based	Web-based	Web-based
Check availability	No	No	Yes	Yes
Latest events update	Yes	No	Yes	Yes
Registration and login	Not compulsory	No need	Compulsory	Compulsory
Ticket purchase	Available	WhatsApp booking	Available	Available
Accommodation booking	Not applicable	WhatsApp booking	Not applicable	Available
Private event booking	Not applicable	Available	Not applicable	Available
Room cancellation	Not applicable	Not applicable	Not applicable	Available
Payment method	Credit/Debit Card, Online banking, E-wallet	Credit/Debit Card, Online banking, E-wallet	Credit/Debit Card, Online banking, E-wallet	Cash, Credit/Debit Card, Grab Pay, Alipay
QR code implementation on ticket purchase	No	No	Yes	Yes
QR code implementation on room reservation	No	No	No	Yes

Farm in The City Booking System allows tickets to be purchased online and it is valid within 90 days. Thus, the customers can make a single visit anytime within three months' time without worrying about having to reschedule the date. The system allows the customers to make ticket purchases without the need to register and sign in an account. The disadvantage of this system is it does not provide other booking services like the Labis Sunrise Farm Reservation System and the developed system do. On the other hand, Labis Sunrise Farm Reservation System has the advantage of allowing the customers to make all kinds of booking services directly from customer services without using any account. The

disadvantage of this system is it relies on another platform, which is WhatsApp to deal with all booking operations and transactions. This makes the system less interactive and functional. The While for Desa Dairy Farm Online Ticketing System, it has the advantage that allows the customers to check ticket availability before any booking is made. It also allows rescheduling on booking at most three days before the visit date. Moreover, it implements QR code on ticket purchase and room booking process to verify the customers' booking order and ease the entry when entering the farm. The disadvantage of this system is it does not update daily with the latest events or the latest activities, resulting in some customers being unable to access some stations because they were closed without any notice.

The developed system Walters Farm Reservation Management System supports different kinds of booking including tickets, accommodation, and private event venue. Through the website, customers can check booking availability and obtain the latest schedule and event information. The visitor must register an account and sign in before making a booking. Once the booking has been made, a QR code is generated for customers to easily access the farm. Receptionists use a QR code scanner to retrieve ticket order details from the system and use the QR code to simplify the check-in and check-out process for room bookings.

3. Methodology

3.1 Prototype Model

Prototype Model has been chosen as the methodology model for this project. The prototype is used for testing, demonstration, and improvement before the final system is developed and deployed [11]. This allows developers to create a working model quickly before making improvements to the final version. Based on Figure 1, prototype-based methodology model consists of six main phases which include planning, analysis, design, development, testing and implementation [12]. The analysis, design and implementation phase are conducted repeatedly to build up a system prototype. Then, the prototype is reviewed and evaluated to get feedback from stakeholders or customers to refine the requirements needed. The iteration continues until the prototype is accepted to be developed to final system with coding and database.

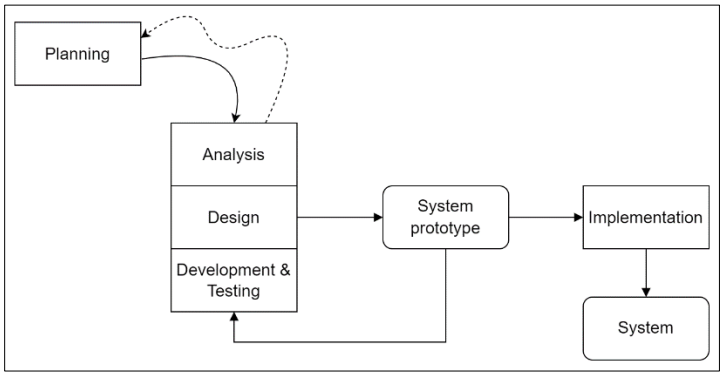

Figure 1: Prototype Model [11]

In the planning phase, the scope, objectives, and significance of the developed system are defined. The specific needs and requirements of Walters Farm, such as managing reservations for different types of activities and coordinating resources, are considered. To outline the specific tasks and milestones of developing the reservation management system, a comprehensive work plan is created using Gantt Chart. In the analysis phase, the issues of Walters Farm in managing bookings or reservations are figured out thoroughly after conducting interviews with the stakeholders at Walters Farm to understand their specific requirements and challenges. Additionally, the questionnaires are distributed to gather input from the public who are the potential customers of Walters Farm to gain insights into their expectations and preferences, such as allowing booking cancellation, displaying latest promotion, and

providing a reminder notification. In the design phase, the system design is created using object-oriented analysis and design (OOAD), to visualize the modules, functionalities and process of booking and reservation management. Wireframes are created to provide specific branding and visual elements relevant to Walters Farm and the system database is designed to store and retrieve booking data and customer data efficiently.

In the development phase, the prototype is coded by developing modules like ticket and accommodation reservation, user management, payment integration for both customers and administrators using Visual Studio Code, PHP, Laravel, Bootstrap, and MySQL. In the testing and review phase, the prototype of the developed system is evaluated. The administrators conduct functional testing, and the customers conduct user acceptance testing, providing feedback on the usability and user experience of the system. Through iteration cycles, any necessary modifications or refinements are made to address identified issues and improve the system's overall performance. The implementation phase deploys the final prototype of the developed system for end users which is accessible to the administrators and customers of Walters Farm.

Table 2: System Development Workflow of The Developed System

Phases	Activity	Deliverables
Planning	1. Identify problem statements, objectives, scope, expected result and project significance. 2. Design a work plan. 3. Study and research of related topics and existing systems.	1. Project proposal. 2. Gantt Chart.
Analysis	1. Construct questionnaire. 2. Distribute questionnaires to public. 3. Interview with the person-in-charge. 4. Analyze and identify user requirements. 5. Identify software and hardware requirements. 6. Identify functional and non-functional requirements. 7. Identify the relationship among all classes.	1. Gather user requirements through questionnaire and interview. 2. Hardware and software requirements. 3. Functional and non-functional requirements. 4. Use case diagram, sequence diagram, activity diagram and class diagram.
Design	1. Design user interface. 2. Design database. 3. Interrelate all data elements.	1. Wireframe. 2. Database design.
Development	1. Develop prototype. 2. Develop system functionalities and modules. 3. Connect database with system.	1. Prototype. 2. Developed system.
Testing and review	1. Perform functional testing. 2. Fix bugs and make improvements. 3. Finalize the latest development system. 4. Perform User Acceptance Testing (UAT). 5. Get feedback from the stakeholder. 4. Review the system and fix the error.	1. Fix the system bugs and errors. 2. Get user feedback through Google Form. 3. Latest system is finalized and ready to release.
Implementation	1. Release the latest development system.	1. Final system is released.

3.3 System Analysis and Design

Requirement analysis is implemented to identify what the customer needs. As part of gathering requirements, it is important to consider functional and non-functional aspects to identify the contexts, constraints, and objectives [12]. The functional requirements of the system define the basic functionality of the system. It includes registration, login, update personal information, make reservations, make payment, check booking history, generate sales report and many more. The non-functional requirement of the system defines the usability of the system, which considers from the aspects of performance, operational, security, cultural and political.

Unified Modeling Language (UML) is an open-standard graphical description language used in software development to model objects through a collection of diagrams [13]. The UML diagrams include use-case diagram, sequence diagram, activity diagram and class diagram. A use-case diagram visually represents the interactions between the actors and the actions performed on the system, a sequence diagram shows how the actors, objects and classes interact in the system over time, an activity diagram shows the flow of actions and decision between activities and a class diagram defines the system in classes with attributes and methods.

The use case diagram for the developed system is displayed in Figure 2. The customer, administrator, and super administrator are the actors of the system. It illustrates key actions such as user management, ticket purchase with payment processing, room booking, private event booking, and sales report checking.

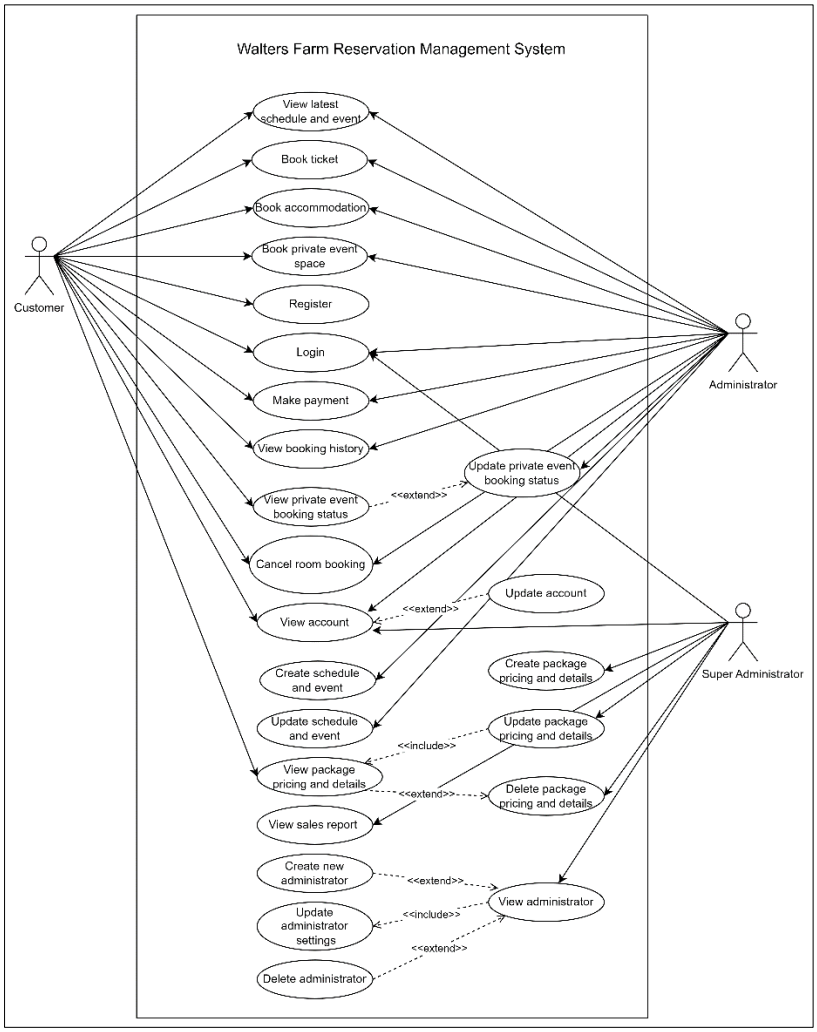

Figure 2: Use Case Diagram of Walters Farm Reservation Management System

A sequence diagram is a graphical representation to show how actors, objects and classes interact in a system over time, how the messages are transmitted between the objects and how the messages are sent and received between each other. Figure 3 depicts the sequence diagram specifically for booking tickets, involving all users of the system. Additionally, Figure 4 showcases the sequence diagram for updating user accounts, involving all users of the system.

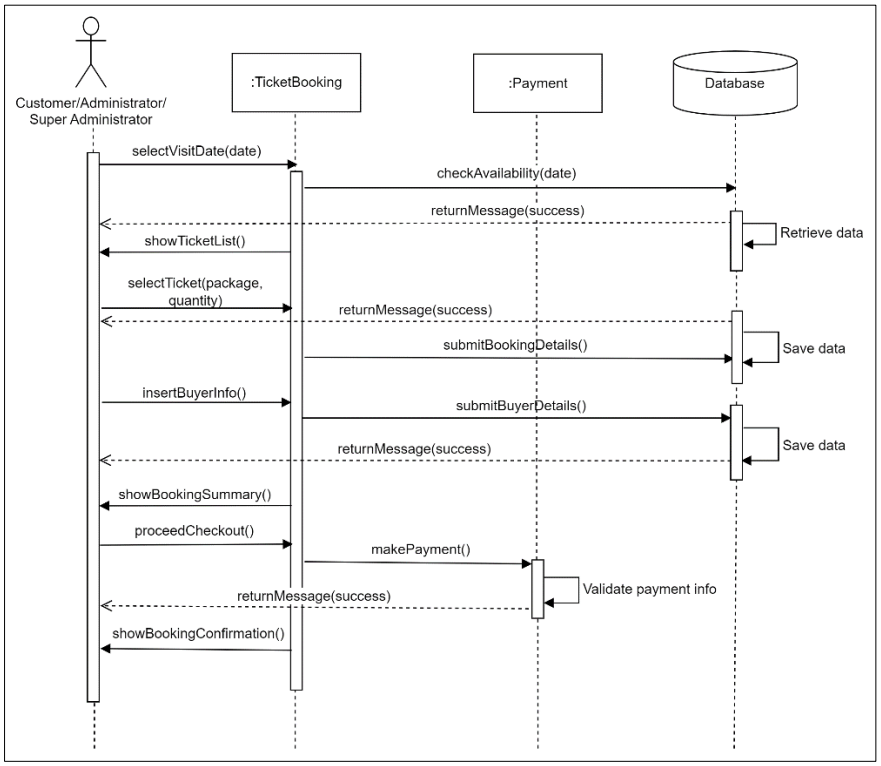

Figure 3: Sequence Diagram of Booking Ticket

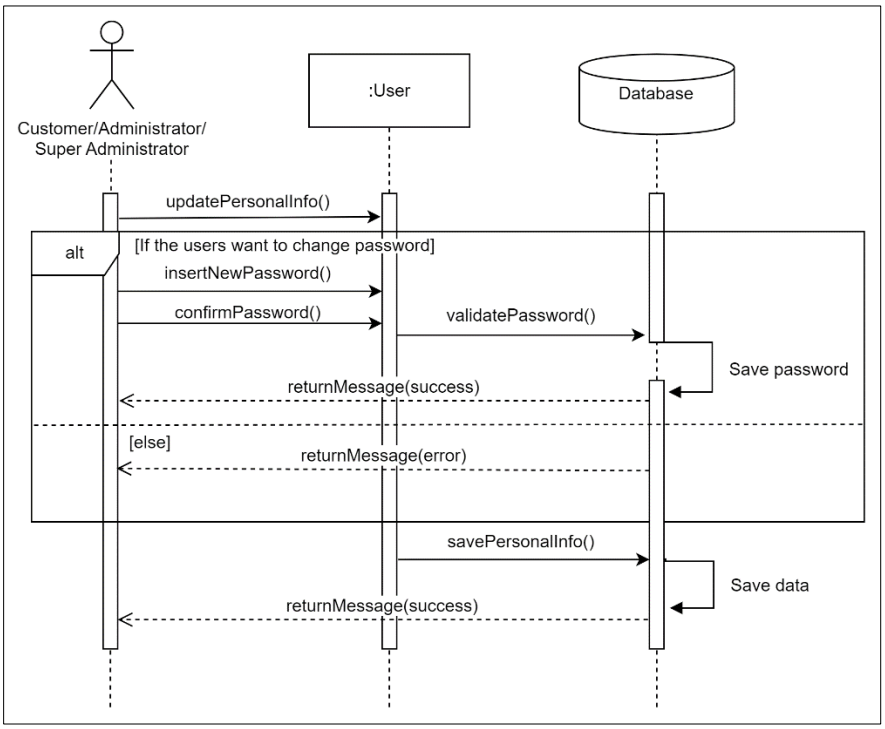

Figure 4: Sequence Diagram of Updating Account Information

A class diagram illustrates the relationships between classes, attributes, methods, and their relationships in a system. It helps visualize and communicate the design of a system, and it is widely used in object-oriented modeling and design. Figure 5 shows the class diagram of Walters Farm Reservation Management System.

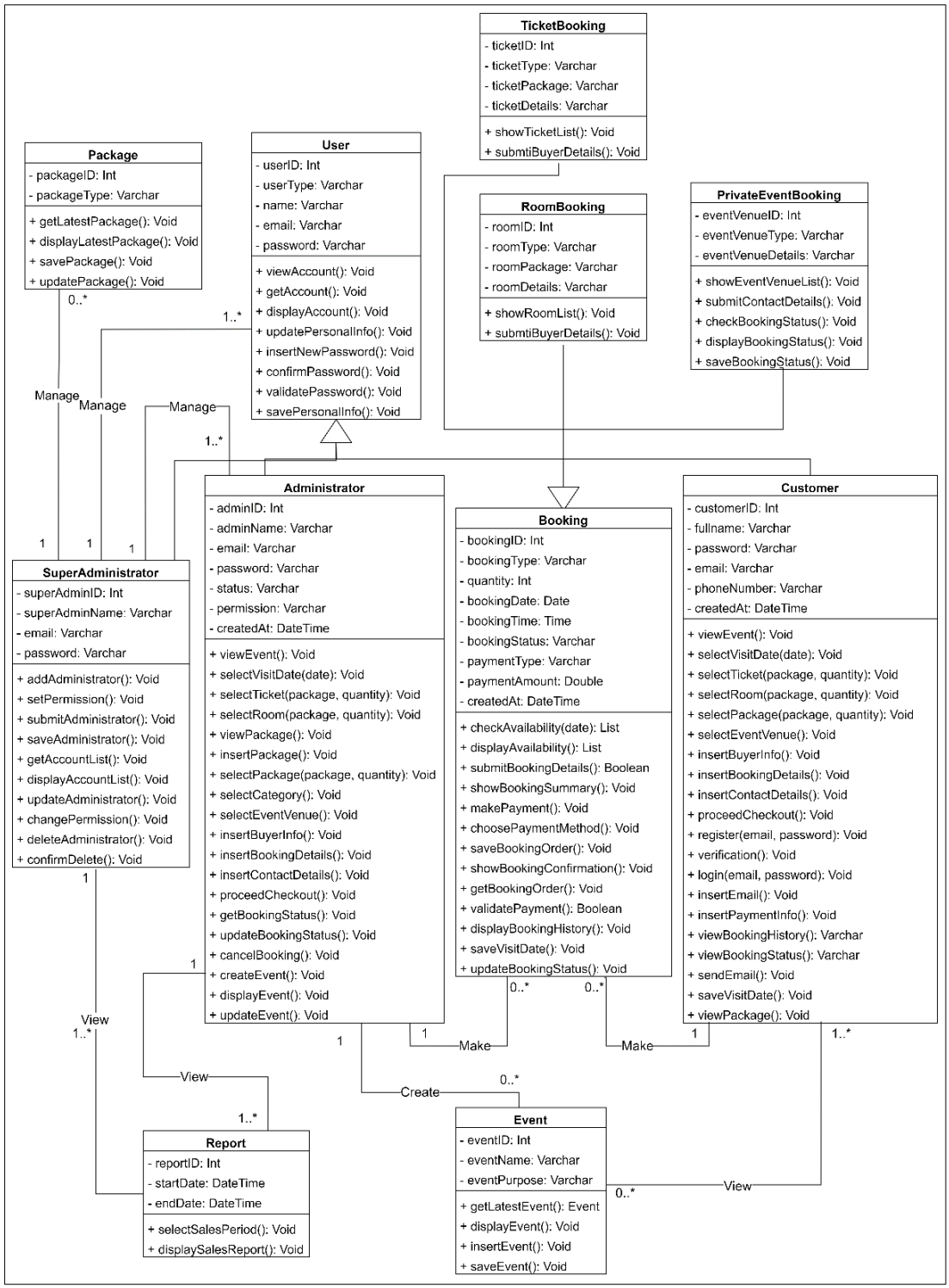

Figure 5: Class Diagram of Walters Farm Reservation Management System

Data dictionaries are defined in the design phase, and the user interface (UI) design is created using wireframes. However, due to the limitations of the paper, the data dictionary and UI design are not included in the paper.

4. Results and Discussion

Implementation phase is important as it transforms the conceptual design into a tangible system, ensuring that the proposed solution is effectively put into action, while the testing phase is important to verify the functionality, performance, and reliability of the implemented system. This section delves into a comprehensive discussion on how the system was implemented and tested using functionality testing and User Acceptance Testing (UAT).

4.1 Implementation Phase

The web-based application is implemented using front-end and back-end technologies, with Visual Studio Code as the IDE. Front-end technologies include HTML, CSS (with Bootstrap framework), and JavaScript. Back-end technologies include PHP (with Laravel framework) for server-side processing and MySQL for the database. The database schema can be executed in the Laravel environment through the CLI. In Figure 6, the login and register interface of the system is depicted, allowing customers to log in using their email and password. Additionally, the system provides support for Google Sign In as an alternative method for both signing up and logging in for customers. For the administrators, they can access the management system by using their email and password.

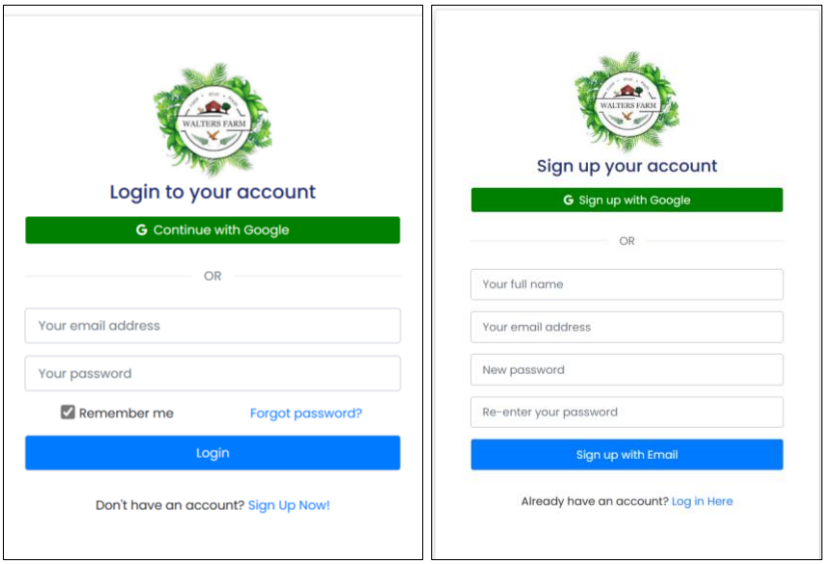

Figure 6: Interface of Customer Login and Register of Walters Farm Reservation Management System

Figure 7 displays the user interface for updating user profiles, available for both customers and administrators. Similar to administrators, customers have the ability to modify their full name, email address, and contact number through the account settings in their registered accounts. Additionally, customers are also able to change their password for enhanced security.

Figure 7: Interface of Customer Profile Update

Figure 8 depicts the user interface for managing profiles and user accounts by a super administrator. In this interface, the super administrator can add a new administrator by entering the individual's name, email address, password, and confirming the password. Additionally, the super administrator can assign privileges to the new user, specifying whether they have the role of an administrator or a super administrator.

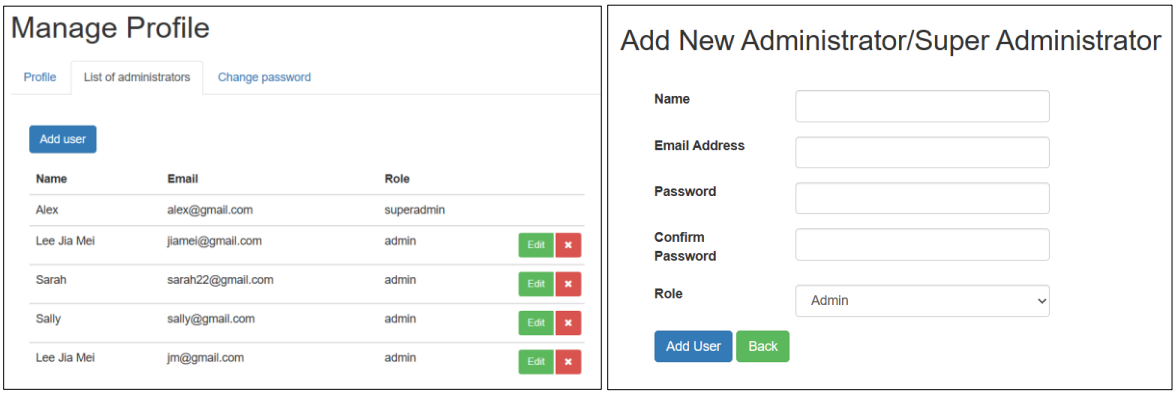

Figure 8: Interface for Administrator Profile and User Management

Figure 9 displays the user interfaces for ticket purchasing and room booking. To successfully complete the booking process, customers are guided to follow the provided instructions or steps. Firstly, they need to select a visit date to check the availability of tickets or rooms. Once the availability is confirmed, they can proceed to choose the desired package or quantity. Figure 10 shows the code segment of storing ticket purchase information. Finally, customers are prompted to complete the booking by making the payment as shown in Figure 11.

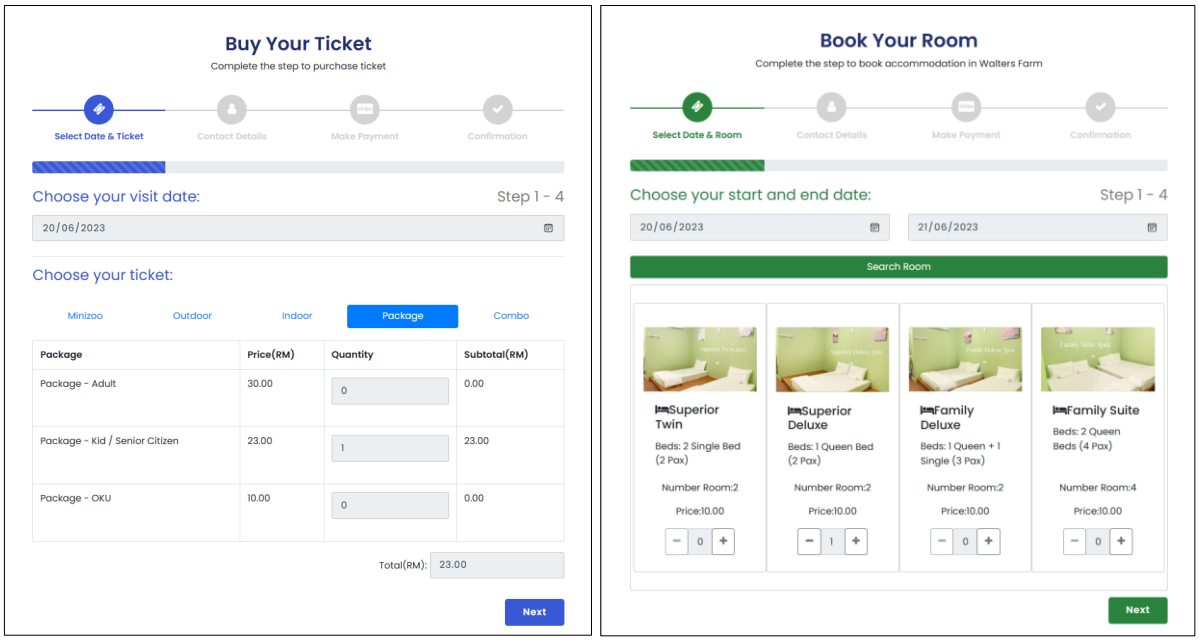

Figure 9: Interface of Customer Ticket Purchase and Room Reservation

```php
public function store(Request $request)
{
    if  ( empty(Auth::guard('customers')->user()->id) ){
        return $this->index();
    }
    $this->validate($request, [
        'ticket-date' => 'required',
    ]);

    $total_price = 0;

    foreach ( $request['package'] as $key => $package ){
        if ($request['qty'][$key] > 0 ){
            $total_price += $request['price'][$key]*$request['qty'][$key];
        }
    }

    $ticket = new Ticket([
        'package' => $request->input('package'),
        'quantity' => $request->input('quantity'),
        'user_id' => '0',
        'customer_id' => Auth::guard('customers')->user()->id,
        'ticket_date' => $request->input('ticket-date'),
        'total_price' =>$total_price,
        'payment_method' => $request->input('stripe_payment'),
        'payment_id' => '',
        'status' => "Pending",
        'customer_name' => $request->input('name'),
        'customer_phone' =>$request->input('phone'),
        'customer_email' => $request->input('email'),
        'ticket_id' => "T-".strtoupper(Str::random(10)),

    ]);

    $ticket->save();

    foreach ( $request['package'] as $key => $package ){
        if ( $request['qty'][$key] > 0 ){
            $ticket_detail = new Ticket_detail([
                'ticket_id' => $ticket->id,
                'package_id' => $key,
                'package_name' =>$request['package'][$key],
                'package_price' => $request['price'][$key],
                'package_quantity' => $request['qty'][$key] ,
            ]);
            $ticket_detail->save();
        }
    }
```

Figure 10: Code Segment of Storing Ticket Purchase Information

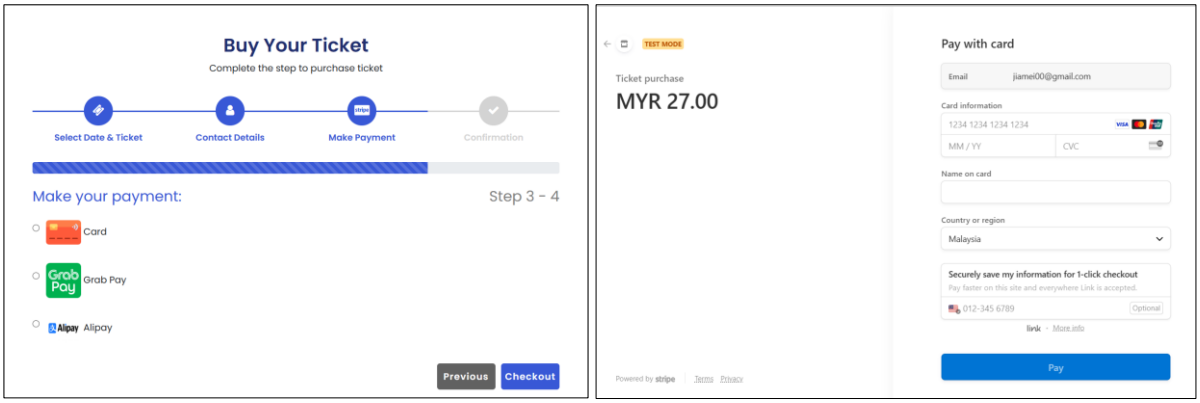

Figure 11: Interface of Customer Make Payment and Payment Gateway

Upon successful payment using the selected payment method, customers are redirected back to the booking confirmation page. The confirmation page includes comprehensive ticket order details, such as a unique order ID presented in a QR code format. Additionally, customer information is provided, including their name, phone number, and email address. Furthermore, the order details are presented, specifying the selected package, quantity, and total price of the order as shown in Figure 12. Customers have the option to print their receipt from their account's booking history at any time.

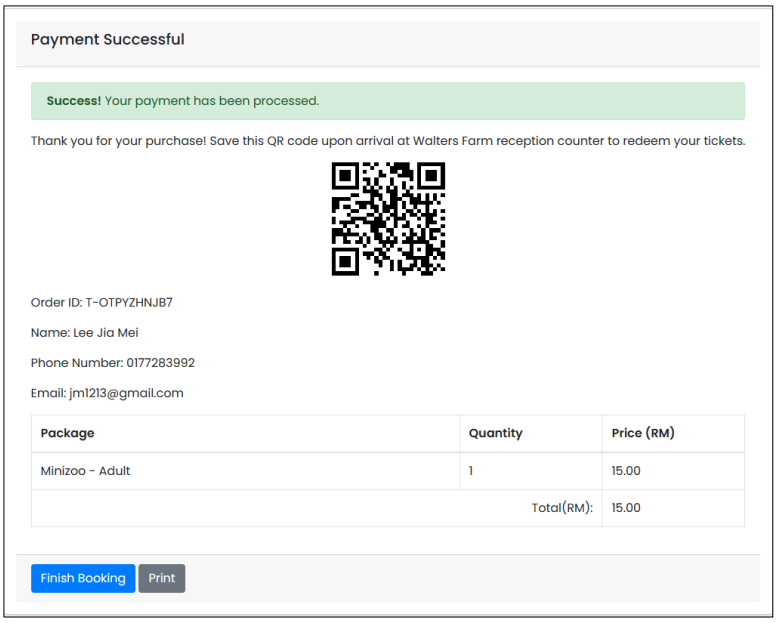

Figure 12: Interface of Customer Booking Confirmation with QR Code

Figure 13 shows the QR code scanner in the administrator panel that is used by the administrators or the receptionists to easily scan and retrieve booking order details from customers upon their arrival at Walters Farm. The customers do not need to wait in a long queue to buy tickets, instead they can directly redeem physical tickets at the counter based on the QR code provided. This generates a more secure and convenient way for them when booking tickets or accommodation. Once the QR code is validated, the customers will get physical tickets to enter the farm seamlessly. While for the room booking, the QR code is used to enable the administrators to record check-in and check-out time.

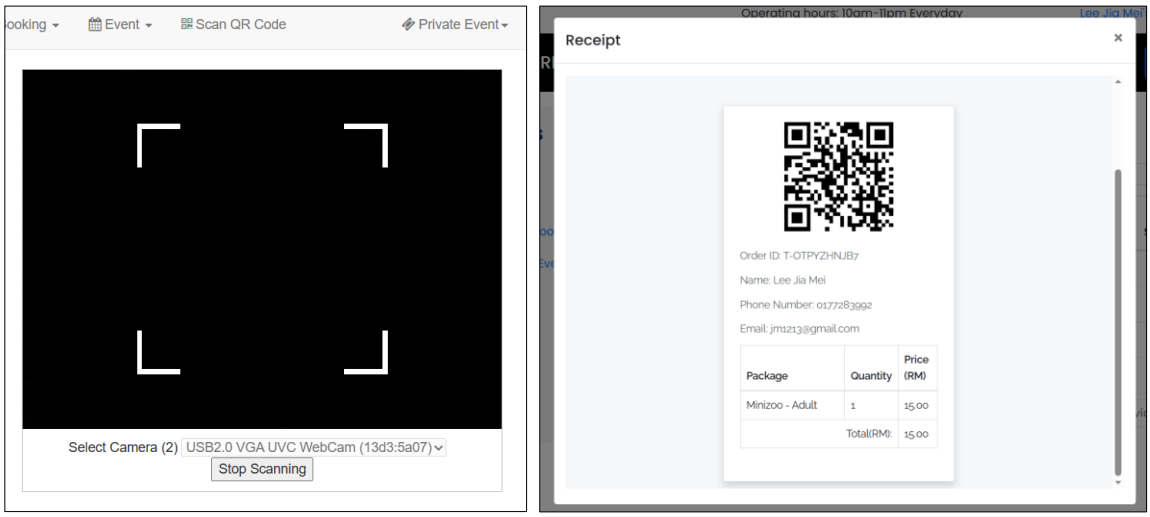

Figure 13: Interface of Administrator Scanning QR Code and Retrieving Receipt

Figure 14 shows the private event space reservation request that is submitted from customer side to administrator side. The customer needs to insert a start date and end date of event, choose venue of event, enter event purpose and contact information before the submission to make a booking request. The administrator needs to update the status of the booking request either approve or reject the booking on the specific date, time, and venue. The customers can always check the booking status at their booking history for further updates. Once the booking status is updated, they can notice the status either 'Accepted' or 'Rejected', else it remains status 'Pending'. The code segment of storing private event space reservation request is shown in Figure 15.

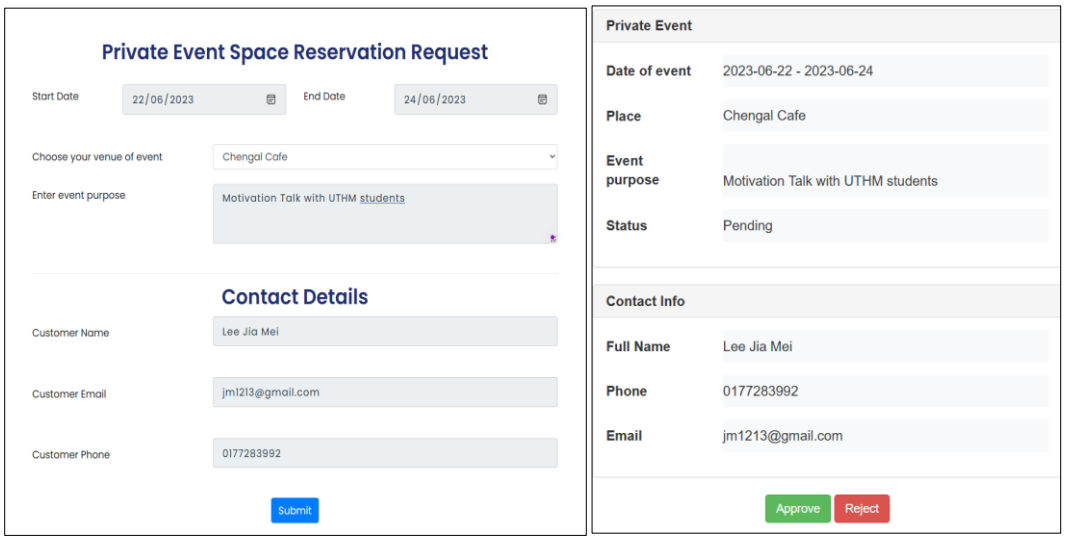

Figure 14: Interface of Private Event Space Reservation

```php
$this->validate($request, [
    'place' => 'required',
    'name' => 'required',
    'email' => 'required',
    'phone' => 'required',
    'eventPurpose' => 'required',
    'start_date' => 'required|date',
    'end_date' => 'required|date|after:start_date',
]);

$privateEvent = new PrivateEvent([
    'place' => $request->input('place'),
    'purpose' => $request->input('eventPurpose'),
    'customer_id' => Auth::guard('customers')->user()->id,
    'start_date' => $request->input('start_date'),
    'end_date' =>  $request->input('end_date'),
    'status' => "Pending",
    'customer_name' =>  $request->input('name'),
    'customer_phone' =>  $request->input('phone'),
    'customer_email' =>  $request->input('email'),
    'event_no' => "P-".strtoupper(Str::random(10)),
]);

$privateEvent->save();

return redirect("/customer-private-event/new")->with('status', 'Private event created successfully');
```

Figure 15: Code Segment of Storing Private Event Space Reservation Request

Figure 16 shows the list of events in the administration panel, where the administrators can create, read, update, and delete (CRUD) the latest event with the details like the event title, description, event start time, event end time with event image. The visitors or customers can browse the event update and notice with the latest information along with other upcoming events as shown in Figure 17. Figure 18 shows the code segment of creating a new event information.

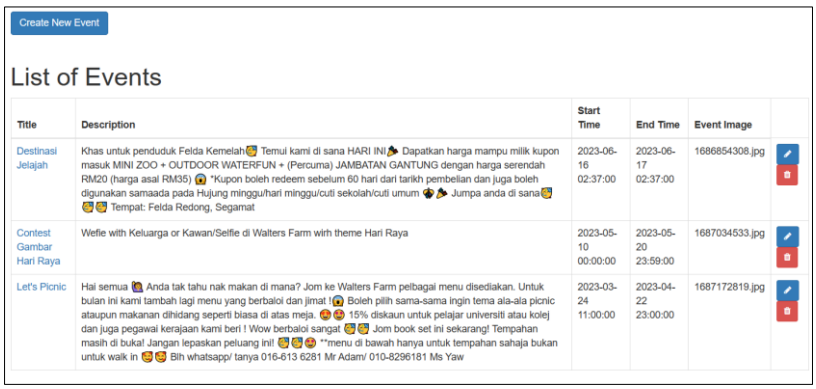

Figure 16: Interface of List of Events in Administrator Panel

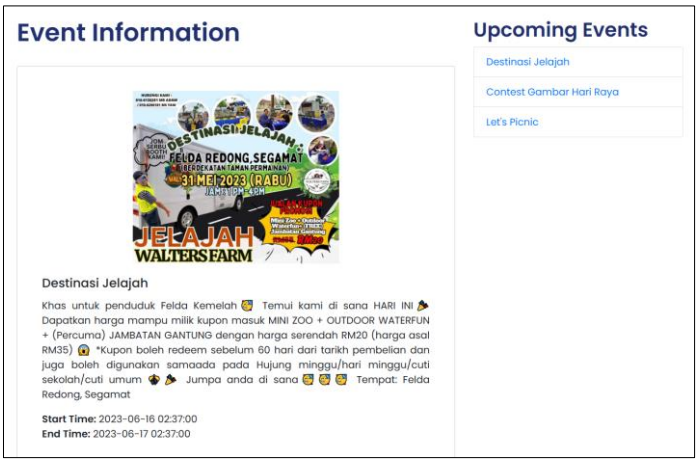

Figure 17: Customer Interface for Event Information Display

```php
// Create the event
$event = new Event;
$event->title = $request->input('title');
$event->description = $request->input('description');
$event->start_time = $request->input('start_time');
$event->end_time = $request->input('end_time');
if (isset($imageName)) {
    $event->image = $imageName;
}

$event->save();

return redirect()->route('events.index')->with('success', 'Event created successfully');
```

Figure 18: Code Segment of Creating a New Event Information

In the administration panel, the super administrators and the administrators have the privileges to assist customers in purchasing ticket and booking accommodation, as well as monitoring the sales performance of tickets sold and rooms that have been booked. The sales profit for tickets and room bookings can be checked weekly, monthly, and yearly.

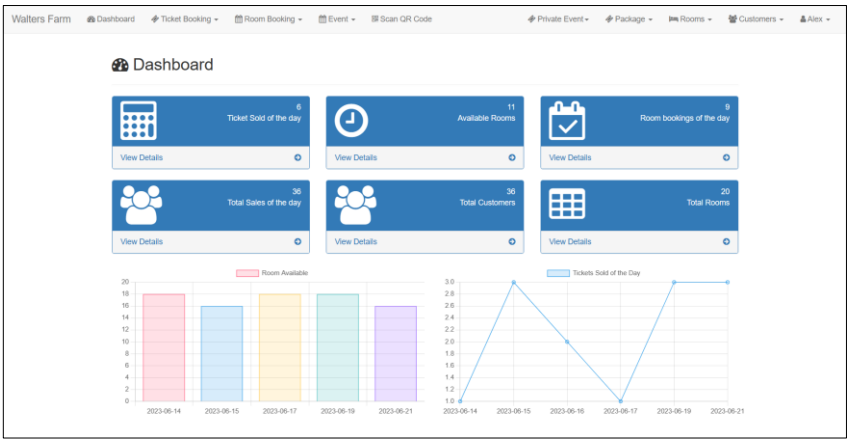

Figure 19: Administrator Interface for Dashboard and Sales Performance Display

4.2 System Testing

4.2.1 Functional Testing

Functional testing is performed by executing test cases that are organized by modules. This type of testing verifies whether the system fulfills the functional requirements outlined in the developed system. It involves identifying test scenarios and designing corresponding test cases for each module. During execution, the actual results are compared to the expected results to identify and track any defects or

errors. The overall success of each module of the test plan is reflected in Table 3, which displays the actual results.

Table 3: Test Plan of The System Module and Results

Module	Functions	Test	Expected Output	Actual Output
User management module	Register	Incomplete data input	An alert message shows if the input field is empty.	Pass
		Unique email address	An alert message shows if the entered email address already exists in the database.	Pass
		Valid password	An alert message shows to indicate the password must contain at least one number, one uppercase and lowercase letter, and be at least 8 characters long.	Pass
	Login	Complete input with invalid email address or password	An alert message shown indicates both fields should match with database.	Pass
	User profile	Update user profile with valid input	The user can update their full name, email address and contact number. A successful message shows after changes has been updated.	Pass
	Forgot password	Update password with validate email	An alert message shows if the entered email address does not exist in the database.	Pass
		Complete email input	Successfully sent reset password link to user's email.	Pass
	Manage customer information	CRUD customer with valid input	The user can create new customer with valid input, read list of customers, update customer profile, and delete customer after confirmation.	Pass
	Administrator settings	CRUD new administrator with valid input	The user can create new administrator with valid input, read list of administrators, update administrator profile, and delete administrator after confirmation.	Pass
Ticket and accommodation reservation module	Book ticket	Select visit date	The user can only select visit date from current date onwards.	Pass
			Prices change based on weekday/weekend.	Pass
		Select ticket type, package and quantity	The user must select at least one ticket from the selection list, else cannot proceed to next step or show alert message.	Pass
			The subtotal and total price change according to the quantity input.	Pass

Table 3: (cont.)

Module	Functions	Test	Expected Output	Actual Output
Ticket and accommodation reservation module	Book room	Select check-in and check-out date	An alert message shows when the start date or end date is empty, end date is earlier than start date.	Pass
		Show room availability	The room list displays the availability of each room category before the user proceeds with the booking.	Pass
		Select room type and quantity	The user must select at least one room from the room list, else cannot proceed to next step or show alert message.	Pass
	Book ticket or book room	Complete contact details with valid input	An alert message shows to indicate customers' contact information must be filled out including full name, email address and contact number.	Pass
		Booking summary is shown after payment	The user will be redirected back from payment gateway and return a booking summary with QR code after payment is successful.	Pass
	View booking history	Display ticket booking or room booking history	The user can view and check the booking history through their account.	Pass
	Validate QR code	Scan QR code on ticket booking	The user can scan QR code to retrieve ticket order details from the system.	Pass
		Scan QR code on room booking	The user can scan QR code to retrieve room details and help customers check-in and check-out process.	Pass
Private event reservation module	Make private event space booking request	Select event date	The user can only select visit date from current date onwards.	Pass
			An alert message shows when the start date or end date is empty, end date is earlier than start date.	Pass
		Select event venue, event purpose, number of participants	An alert message shows when the event venue, event purpose and number of participants field are not complete.	Pass
		View booking status	The user can view the booking status either pending, accepted, or rejected.	Pass
	Manage private event space booking request	Update booking status	The user can update booking status either accept or reject the booking request from the customers.	Pass

Table 3: (cont.)

Module	Functions	Test	Expected Output	Actual Output
Payment module	Payment	Correct amount	The payment amount is shown correctly when redirects the user to the payment gateway to continue the procedure.	Pass
		Stripe payment gateway	The user is redirected to Stripe payment gateway to proceed credit/debit card, Grab Pay or Alipay method.	Pass
		Payment status	The payment status is shown after payment is made either success or fail.	Pass
Schedule and event module	Manage schedule and event	CRUD event and details with valid input	The user can create new event, read list of events, update, and delete events.	Pass
Sales report module	Calculate total tickets sold, rooms booked and sales performance	Show sales and profit in week, month, and year	A graph on ticket sold or room booking is shown based on the week, month, and year.	Pass

4.2.2 User Acceptance Testing

User Acceptance Testing (UAT) is a testing approach where the software system is verified and accepted by the end-user or customer prior to its deployment in the production environment. The customers of Walters Farm are chosen randomly to answer survey forms to evaluate user acceptance on the developed system. A total of 16 users participated in the testing, including one designated person-in-charge who acts as a super administrator or administrator, and 15 random users who assume the role of customers. The outcome is evaluated and presented in a graph after the data collected from the users. as shown from Figure 20 to Figure 24.

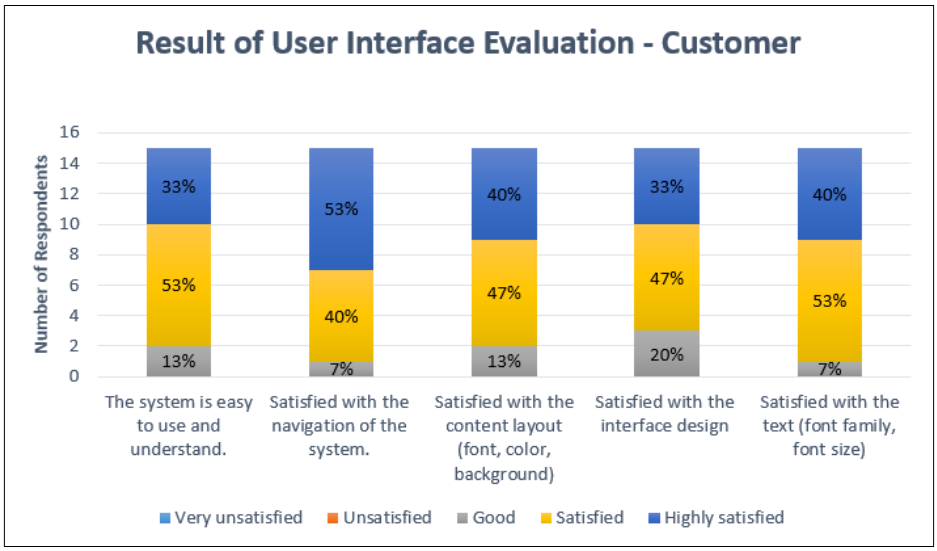

Figure 20: Result of User Interface Evaluation from Customer

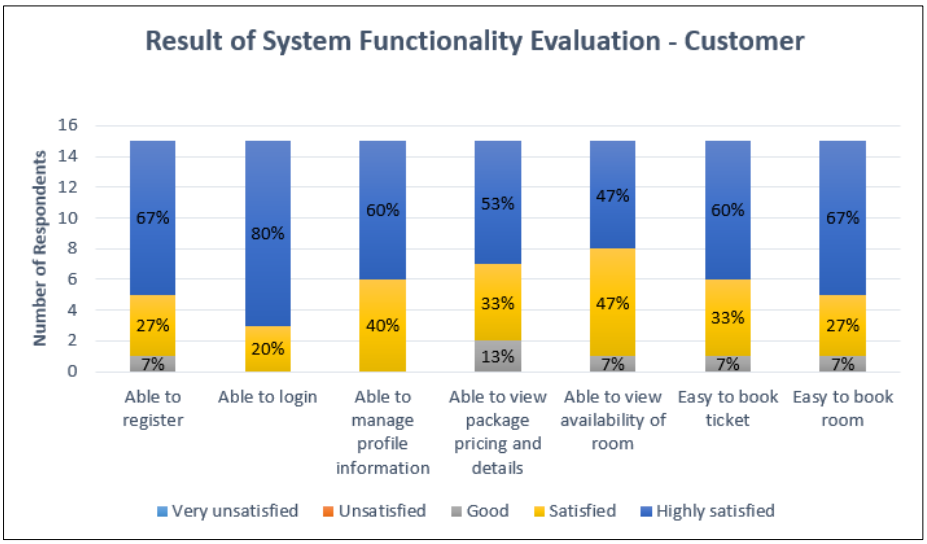

Figure 21: Result of System Functionality Evaluation from Customer (Part 1)

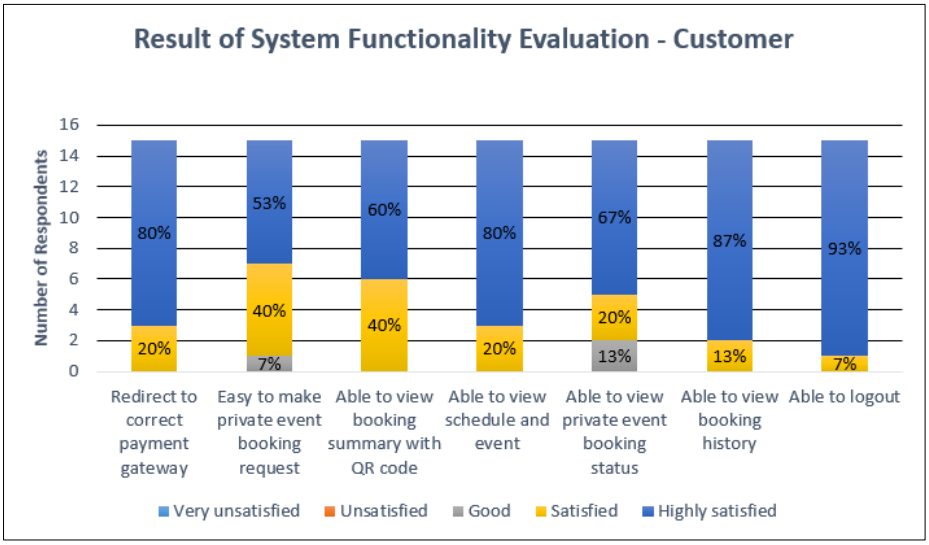

Figure 22: Result of System Functionality Evaluation from Customer (Part 2)

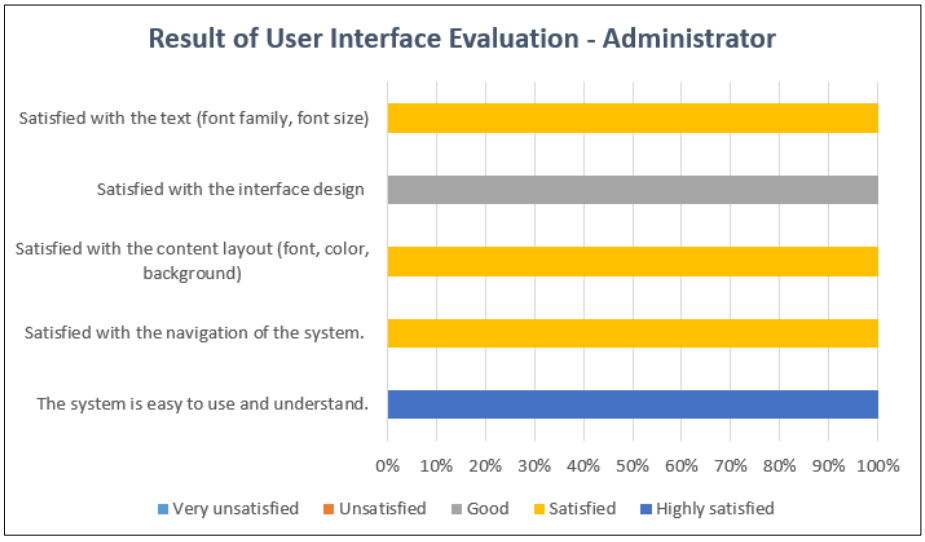

Figure 23: Result of User Interface Evaluation from Administrator

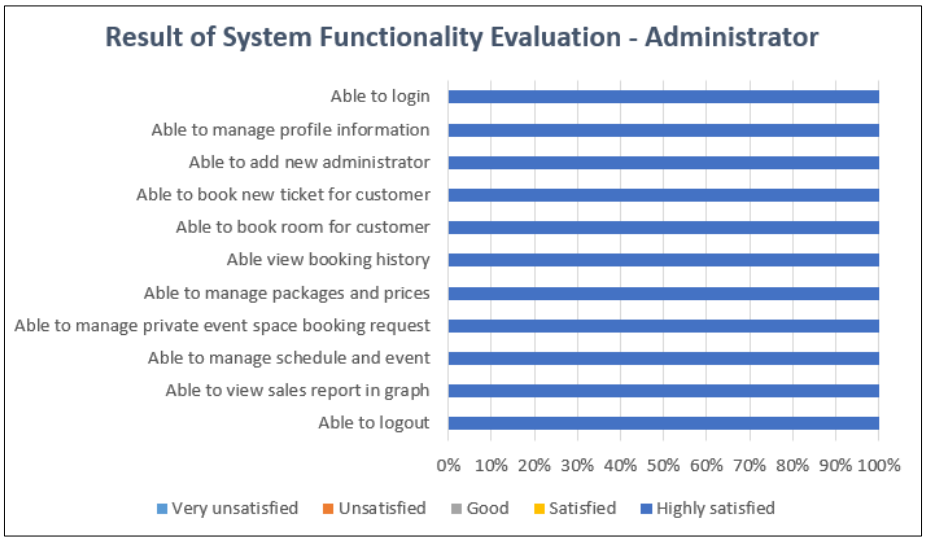

Figure 24: Result of System Functionality Evaluation from Administrator

5. Conclusion

In conclusion, Walters Farm Reservation Management System is a web-based reservation management system that provides an all-in-one integrated platform, which has been successfully developed for the users to make online bookings and aids the organization in improving business efficiency. Overall, the results from the functional testing and UAT evaluation indicate that both customers and administrators are generally satisfied with the system. Most aspects of the user interface and system functionalities received positive feedback, indicating a well-designed and functional system.

However, there are some limitations for this developed system. One of the limitations is the user interface lacks full responsiveness, making it difficult for mobile users to navigate the web system effectively. Furthermore, the ticket booking process does not allow the application of promotion codes during the checkout of an order. The QR code scanner feature only retrieves booking details instead of validating ticket admission due to hardware limitations. The payment method supports credit/debit card, Grab Pay, and Alipay, but does not include e-wallet payment options. In terms of security, the web system lacks enhanced measures like AES-256 encryption to ensure secure encryption of customer data, transactions, and company data.

To improve the usability of Walters Farm Reservation Management System, some improvements can be made in the future. The recommendation for improving the system is to implement email notification as a reminder where the users can be notified if there are any updates on the booking status. Not only that, but it is also better to enhance customer satisfaction if the system supports live chat and provides membership to the customers. Furthermore, it would be advantageous to enhance the system by implementing a reschedule and refund function that allows users to modify their bookings or request refunds. Additionally, for future improvements, the system could be enhanced to generate e-tickets for seamless admission.

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