

# Development of a Mobile-based Application for RJ Studio's Administration and Booking using an object-oriented approach

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**Abstract:** RJ Charter is a mobile application designed to address the challenges faced by RJ Studio, a photography studio, in managing bookings and enhancing customer convenience. With a lack of a proper booking system, customers struggle to check the studio's availability, while the management team faces difficulties in organizing and managing bookings effectively. RJ Charter aims to resolve these issues by providing a user-friendly interface for customers to easily book available slots. Through features like a booking system and administration system, the application streamlines the management of bookings, providing real-time updates on schedules. Developed using Android Studio, Laravel, and Dart programming language, RJ Charter enables customers to book photography sessions, reserve studio time, and place printing service orders, eliminating the need for physical visits or phone calls. By enhancing operational efficiency and offering a seamless experience, RJ Charter aims to transform the way customers interact with RJ Studio and simplify booking management.

**Keywords:** Mobile Application, Booking System, Prototype Methodology

## 1. Introduction

In today's digital age, mobile applications have revolutionized the way businesses operate and interact with their customers. RJ Studio, a photography studio offering a range of services including photoshoots, studio rentals, and printing services, has recognized the need for an efficient and streamlined administration and booking system. To address the challenges they face with manual processes and communication channels, RJ Studio is introducing a new brand mobile application called RJ Charter. RJ Charter aims to provide a user-friendly interface for customers to conveniently book and manage their appointments, while also improving the efficiency of the management team's booking and scheduling processes. By leveraging the power of mobile technology, RJ Studio seeks to enhance customer satisfaction by offering convenient access to high-quality services and efficient interactions.

Currently, RJ Studio relies on manual input and paper-based documents, leading to complications and miscommunications with customers. The lack of a proper system for managing bookings and availability has resulted in scheduling conflicts and logistical issues. To overcome these challenges, RJ

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Charter will introduce a comprehensive booking system that allows customers to view the availability of RJ Studio before making a reservation, thus reducing the risk of overpromising or double booking. Moreover, RJ Studio's studio rental services have been handled manually, lacking a proper system to manage equipment availability and rental fees. RJ Charter will address this by providing a studio equipment rental service within the app, presenting customers with a list of available dates and rental packages.

Furthermore, an online payment system will be implemented to handle all online transactions, allowing customers to conveniently pay deposits online and balance payments in cash. Additionally, customers will have access to their booking details through the RJ Charter application, providing transparency and peace of mind. This application consists of 6 modules which are the registration module, login module, user and administration module, packages and services module, booking and scheduling module, and also payment module.

Overall, RJ Charter represents a significant step forward for RJ Studio in embracing digital transformation. By implementing a mobile-based application for administration and booking, RJ Studio aims to enhance their operational efficiency, provide exceptional customer experiences, and establish itself as a leading photography studio in the industry.

The article is organized into four sections. The first part is an introduction describing the context of the project. The second section describes the literature review of the related work and existing system. In the third section, the methodology used to develop the application including the analysis and design is explained. The implementation and testing of this system are described in the fourth section. In the last section, a conclusion with some instructions for future employment is given.

## **2. Related Work**

### **2.1 Booking and Administration System**

An online booking system is a software solution and reservation system which makes it easy for customers to reserve and pay for their activities [1]. An online booking system will allow users to book without getting stressed. Through the online booking system, customers will be able to see the bookings and other customers' bookings in real-time. There will be no more manually updating spreadsheets, only effortlessly synced data. A booking system offers customers more than just the ability to passively accept online bookings and payments [2]. One of the most significant benefits of an online booking system is that as a business administrator, we can remain open to the business 24 hours a day. Everything is more accessible when it is online. Moreover, manual data entry of customers might take a lot of time. In addition, from booking to checkout, reservation technology expedites the entire process.

### **2.2 Mobile-Based Application**

Mobile-based application, commonly addressed as an app, can be defined as a type of application software designed to run on a mobile device. In this era of technology, mobile-based application development is one of the rapidly growing industries where it has wide use for its vast functioning area. Mobile-based applications run on a small handheld device that is portable, easy to use, and available from anywhere at any time [3]. In addition, mobile applications are simple, user-friendly, inexpensive, easily downloadable, and accessible.

### **2.3 Comparison of Equivalent Systems**

Three existing systems related to the current developing application were analyzed and researched to know what to develop in the application, and what features should be included to develop a better, user-friendly application. Three existing systems are reviewed and compared which are Loominos Studio, YellowHive, and Glance Photography Studio.

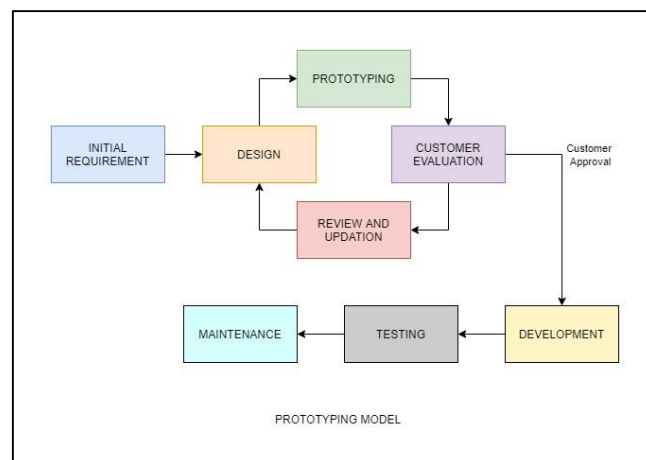
RJ Charter offers competitive advantages over other systems by being more accessible to customers who prefer mobile devices. It includes a registration and login module, allowing for easy tracking of customer information and booking history. Unlike other systems, RJ Charter features a Rental Studio and Equipment module, expanding the range of services available and potentially increasing revenue. The application also provides online payment and receipt generation, enhancing convenience for customers and streamlining the payment process. The Packages and Services module, present in all systems except YellowHive, enables customers to view available options, promoting services effectively and increasing revenue. Overall, RJ Charter's comprehensive and efficient system meets customer needs and simplifies administration processes. Table 1 shows the comparison table.

**Table 1: Comparison Table**

| Features/system              | Loominos Studio | YellowHive | Glance Photography Studio | RJ Charter   |
|------------------------------|-----------------|------------|---------------------------|--------------|
| Operating System             | Web-based       | Web-based  | Web-based                 | Mobile-based |
| Registration Module          | No              | Yes        | Yes                       | Yes          |
| Login Module                 | No              | Yes        | Yes                       | Yes          |
| Packages and Services Module | Yes             | No         | Yes                       | Yes          |
| Booking Module               | No              | Yes        | No                        | Yes          |
| Rental Studio and Equipment  | No              | No         | No                        | Yes          |
| Payment                      | No              | No         | No                        | Yes          |
| Generate Receipt             | No              | No         | No                        | Yes          |
| Clear Navigation             | Yes             | Yes        | Yes                       | Yes          |

### 3. Methodology

The prototype model is used as the methodology to build the RJ Charter application. Figure 1 shows the prototype model. The prototype model consists of 8 phases.



**Figure 1: Prototyping Model**

Table 2 shows the task performed in each phase of the prototype model for the RJ Charter application.

**Table 2: Task performed in each phase in Prototype Model**

| Phase               | Task   |
|---------------------|--|
| Initial Requirement | <ol style="list-style-type: none"> <li>1. Analysis of the existing manual system in RJ Studio.</li> <li>2. An interview is conducted with the manager and owner of RJ Studio, Mr.Sakthi to gather and analyse the user expectation and requirements.</li> <li>3. Analyse the software aspects collected</li> <li>4. Identify the software development model to be used in developing RJ Charter application</li> </ol> |
| Design              | <ol style="list-style-type: none"> <li>1. Design is created for RJ Charter: Mobile-based Application for RJ Studio Administration and booking</li> <li>2. Design flowchart, use case diagram, and UML class diagram for RJ Charter.</li> <li>3. Design user interface for RJ Charter.</li> <li>4. Develop a database.</li> </ol>   |
| Prototyping         | <ol style="list-style-type: none"> <li>1. Prototype is developed for RJ Charter: Mobile-based application for RJ Studio Administration and booking based on the design and requirement specification.</li> </ol>   |
| Customer Evaluation | <ol style="list-style-type: none"> <li>1. User evaluation is performed.</li> <li>2. Evaluate how customers can navigate the system while performing a task.</li> </ol>   |
| Review and Updation | <ol style="list-style-type: none"> <li>1. Evaluation from the customer is analyzed.</li> <li>2. Prototype will be updated according to new specifications from customer evaluation.</li> </ol>   |
| Development         | <ol style="list-style-type: none"> <li>1. Program code is built as per the design document specification</li> </ol>  |
| Testing             | <ol style="list-style-type: none"> <li>1. Functional testing will be performed to validate the application against functional requirements and specifications.</li> </ol>  |
| Maintenance         | <ol style="list-style-type: none"> <li>1. RJ Charter: Mobile-based application for RJ Studio Administration and booking is launched.</li> <li>2. Monitor to ensure the application is up to date.</li> </ol>   |

### 3.1 Requirement Analysis

System requirements analysis is the process of determining user result expectations from a proposed system. The major goal of requirements analysis is to make sure that the system will be created in accordance with user wants and to comprehend how to utilize this application in accordance with the established flow.

A functional requirement defines a system or a component of a system [4]. Table 3 shows the functional requirement of the application.

**Table 3: Functional Requirements**

| No | Module                                    | Description  |
|----|---|--|
| 1. | Registration Module                       | <ul style="list-style-type: none"> <li>The application should allow the customer and staff to register themselves before login.</li> </ul>   |
| 2. | Login Module                              | <ul style="list-style-type: none"> <li>The application should allow the customer to log in by entering the email and password.</li> <li>The application should allow the admin to log in by entering the username and password.</li> <li>The application should display an error message when the wrong username and password are entered.</li> <li>The application should redirect the user to the homepage after successful login.</li> </ul>                                |
| 3. | User And Administration Management Module | <ul style="list-style-type: none"> <li>The application should allow the management to view the bookings, and payments done.</li> <li>The application should allow the customers to view the details of RJ Studio.</li> <li>The application should allow the customer to view their profile</li> <li>The application should allow the customer to update their personal details.</li> <li>The application should allow the admin to edit or delete customer details.</li> </ul> |
| 4. | Packages And Services Module              | <ul style="list-style-type: none"> <li>The application should display the printing services, photoshoot packages, and studio rental services that are available in RJ Studio.</li> <li>The application should allow the admin to create, delete, and update details about packages and services available.</li> <li>The system should display a price for each package and service.</li> </ul>   |
| 5. | Booking And Scheduling Module             | <ul style="list-style-type: none"> <li>The application should allow the customer to book an appointment.</li> <li>The application should allow the customer to cancel an appointment.</li> <li>The application should allow the customer to select their preferred date and time for their booking.</li> <li>The application should allow the admin to change or edit the available date of an appointment.</li> </ul>   |
| 6. | Payment Module                            | <ul style="list-style-type: none"> <li>The application should allow the users will pay deposit online for their bookings.</li> <li>The application should generate a receipt.</li> <li>The application should allow the admin to update the payment status of customers, indicating whether they have made full payment for their booking or if there is any pending payment</li> </ul>  |

Non-functional requirements are essential criteria used to assess the performance of a system, focusing on its overall quality rather than specific behaviors [5]. Table 4 shows the Non-Functional Requirements of the application.

**Table 4: Non-Functional Requirements**

| No | Module          | Description   |
|----|-----------------|---|
| 1. | Performance     | <ul style="list-style-type: none"> <li>The system should function for at least 12 hours per day.</li> </ul>   |
| 2. | Operational     | <ul style="list-style-type: none"> <li>The application should be able to work on android.</li> </ul>  |
| 3. | Security        | <ul style="list-style-type: none"> <li>The system should be safe from viruses, Trojans or worms</li> </ul>  |
| 4. | Usability       | <ul style="list-style-type: none"> <li>The general appearance and flow of the application are easily understood by all types of users.</li> </ul>                           |
| 5. | Availability    | <ul style="list-style-type: none"> <li>The application is designed to be simple to use and accessible at all times</li> </ul>   |
| 6. | Maintainability | <ul style="list-style-type: none"> <li>Maintenance will be performed at regular intervals to minimize failure and maximize the application's smooth performance.</li> </ul> |

User requirement specifies what the user expects the RJ Charter to be able to do. Table 5 shows the user requirements for RJ Charter application.

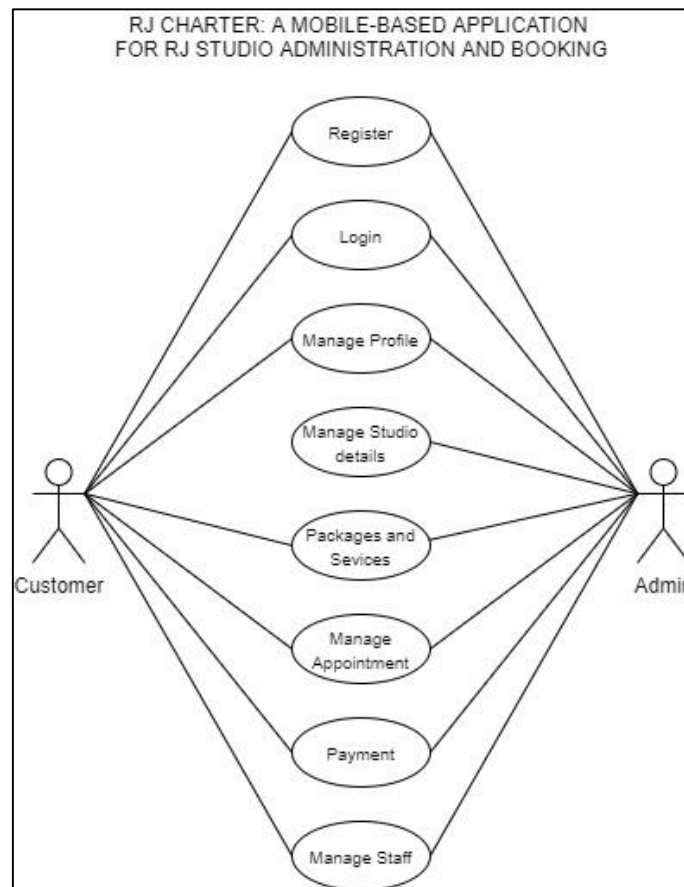
**Table 5: User Requirements**

| No  | User Requirements   |
|-----|---|
| 1.  | The customer should be able to register the application.                                  |
| 2.  | The customer should be able to input the email and password to log in to the application. |
| 3.  | The customer should be able to change the account password                                |
| 4.  | The customer should be able to change their personal details.                             |
| 5.  | The customer should be able to book the appointment.                                      |
| 6.  | The customer should be able to select their preferred booking date and time.              |
| 7.  | The customer should be able to view the packages and services available                   |
| 8.  | The customer should be able to view the available dates of RJ Studio.                     |
| 9.  | The customer should be able to view the booked photoshoot or rental studio details.       |
| 10. | The customer should be able to make payment through the application                       |
| 11. | The customer should be able to download the receipt through the application.              |
| 12. | The customer should be able to log out of the application.                                |
| 13. | The admin should be able to log in to the system.   |
| 14. | The admin should be able to manage staff information.                                     |
| 15. | The admin should be able to add new staff.  |
| 16. | The admin should be able to update the details of services and packages available.        |

| No  | User Requirements  |
|-----|--|
| 17. | The admin should be able to view and edit the unavailable dates of RJ Studio.          |
| 18. | The admin should be able to view the calendar and view booking details from customers. |
| 19. | The admin should be able to view the booking details.                                  |
| 20. | The admin should be able to view total bookings from customers.                        |
| 21. | The admin should be able to update if the customer has completed their payment.        |
| 22. | The admin should be able to log out of the application.                                |

### 3.2 System Analysis

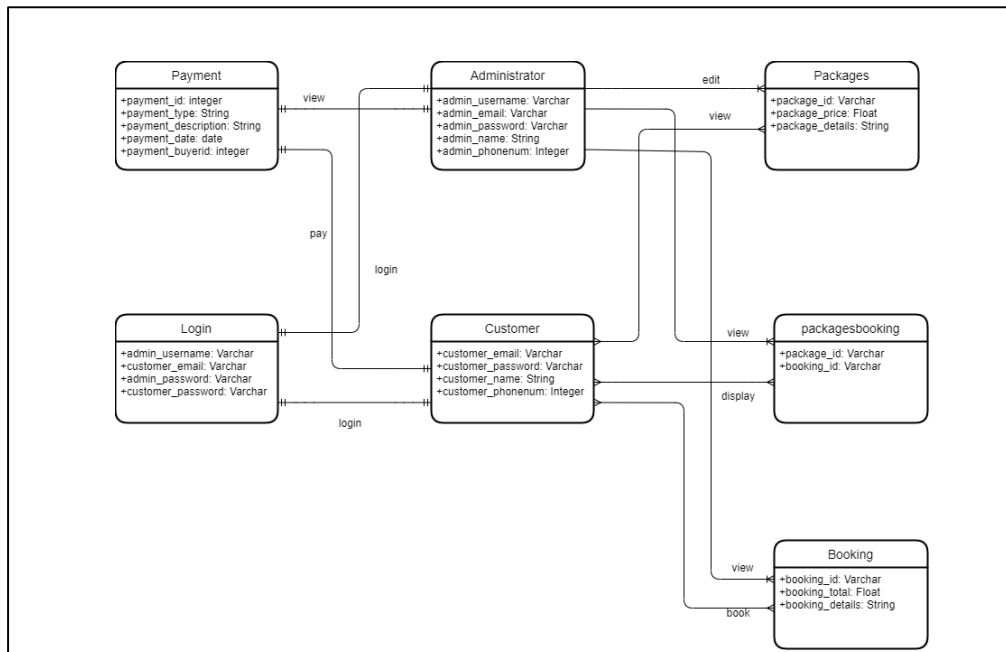
System analysis and design are critical steps in understanding the system comprehensively [6]. System analysis is a technique for compiling and analyzing data, identifying flaws, and breaking down a system into its component parts. Major elements of the UML Use Case Diagram of RJ Charter are shown below in Figure 2.



**Figure 2: Use case diagram**

### 3.3 Class Diagram

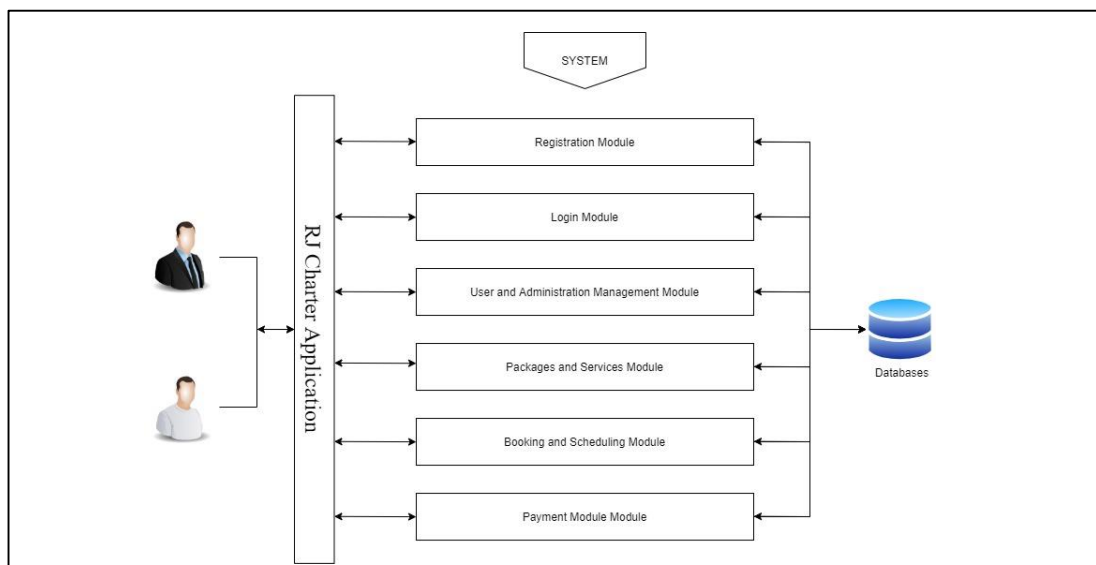
Class diagrams are crucial in determining the properties and methods to be utilized in the proposed application [7]. They help establish the relationships between classes and can be further described using sequence diagrams. Figure 3 shows the class diagram for RJ Charter application.



**Figure 3: Class Diagram**

### 3.4 Overall System Architecture

This system architecture diagram is used to depict how each module in a system interacts with one another [8]. Figure 4 shows the system architecture diagram of RJ Charter.



**Figure 4: Overall System Architecture Diagram of RJ Charter**

### 3.5 Database Design

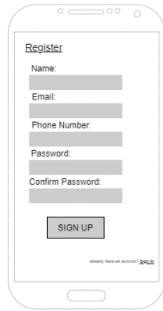
Database design is the process of organizing data based on a database model. It involves identifying the data that needs to be stored and establishing how it relates to each other. The following is the database schema that has been extracted from the Class Diagram.

- i. Customer (cus\_username, cus\_password, cus\_fullname, cus\_email, cus\_phonenum).
- ii. Administrator (admin\_username, admin\_password, admin\_email, admin\_fullname, admin\_phonenum).
- iii. Login (cus\_username, cus\_password, admin\_username, admin\_password )

- iv. Booking (booking\_id, booking\_total, booking\_details, booking\_date).
- v. Payment (payment\_id, payment\_type, payment\_description, payment\_date, payment\_cusid).
- vi. Packages (packages\_id, packages\_price, packages\_details)
- vii. PackagesBooking (booking\_id, packages\_id)

### 3.6 Interface Design

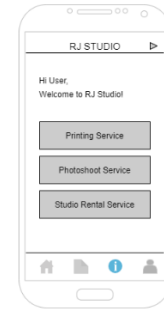
Interface design is the process by which designers create user interfaces for software or automated devices, with an emphasis on aesthetics or style [9]. The application system interface is very important to help users to use the system more easily.



**Figure 5: Registration Interface**



**Figure 6: Login Interface**



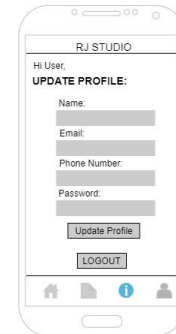
**Figure 7: Packages and Services Interface**



**Figure 8: Appointment Booking Interface**



**Figure 9: Payment Interface**



**Figure 10: User Management Interface**

## 4. Results and Discussion

### 4.1 Implementation

The register module in RJ Charter allows the customers to create an account by entering their personal information and creating a new password as well. This will enable the customers to log in and utilize the features and services provided by RJ Charter. Figure 11 shows the register module page in RJ Charter for customers. Figure 12 shows the code segment for the registration module.

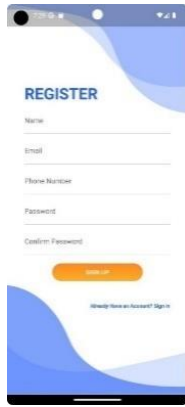


Figure 11: Register module for customer

```

class _RegisterScreenState extends State<RegisterScreen> {
  String name = '';
  String email = '';
  String phoneNumber = '';
  String password = '';
  String cpassword = '';
}
    
```

Figure 12: Code segment for Register module

This Login module in the RJ Charter application enables the customers to securely access their account by entering their email and password. Similarly, the login module for admin will allow authorized admins to log in to their account to manage to book, monitor RJ Charter, and also to perform administrative tasks. Figure 13 shows the login module for customers and followed by Figure 14 which shows the code segment for the login module for customers. Figure 15 shows the login page for admin and its code segment in Figure 16.



Figure 13: Login Module for Customer

```

class _LoginScreenState extends State<LoginScreen> {
  String email = '';
  String password = '';
  String name = '';
  String phoneNumber='';
  bool passPage= false;
  final _formKey = GlobalKey<FormState>();
  @override
  Widget build(BuildContext context) {
    Size size = MediaQuery.of(context).size;
  }
}
    
```

Figure 14: Code segment for Login module for customer

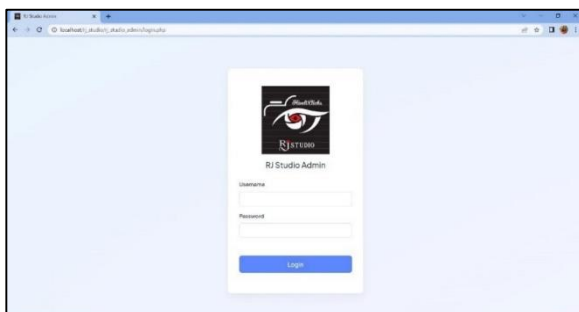


Figure 15: Login Module for Admin

```

<?php
session_start();
$conn = mysqli_connect("localhost", "root", "", "rj_studio");
if ( !isset($_POST['username']) && !isset($_POST['password'])) {

$username = $_POST['username'];
$password = $_POST['password'];
// $hash = md5($password);
$query = "SELECT * FROM admin_users WHERE username='$username'and password='$password'";
$result = mysqli_query($conn,$query) ;
$rows = mysqli_num_rows($result);
$getval = $result->fetch_assoc();
if($rows==1){
$_SESSION['email'] = $username;
$_SESSION['id'] = $getval['id'];
// $_SESSION['pass']

// $_SESSION['getpoint'] = $getval['reward_points'];

header("Location: dashboard.php");
}else{
echo<script>alert("Your Username and Password is Invalid")</script>;
}
}
    
```

Figure 16: Code segment for Login Module for Admin

The User module in RJ Charter will allow the customer to manage their profile, update personal information and change their passwords as well. The Administration Module, on the other hand, allows the admins to view and manage customers' booking details and monitor RJ Studio efficiently. Figure 5.9 shows the user module for customers and figure 5.10 and figure 5.11 shows the code segment module for customers. Figure 5.12 shows the administration module for Admin and figure 5.12 shows the code segment for the administration module.

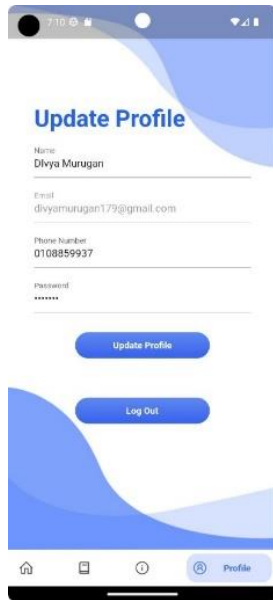


Figure 17: User Module for customer

```
class _Profile_PageState extends State<Profile_Page> {
  String name = '';
  String email = '';
  String phoneNumber = '';
  String password = '';

  final _formKey = GlobalKey<FormState>();
}
```

Figure 18: Code Segment User Module for customer

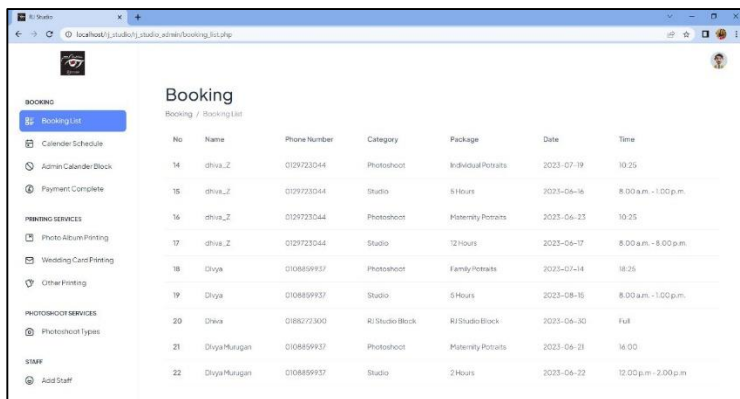


Figure 19: Administration Module for Admin

```
<table class="table">
  <thead>
    <tr>
      <th scope="col">No</th>
      <th scope="col">Name</th>
      <th scope="col">Phone Number</th>
      <th scope="col">Category</th>
      <th scope="col">Package</th>
      <th scope="col">Date</th>
      <th scope="col">Time</th>
    </tr>
  </thead>
  <tbody>
    <tr>
      <td><?php echo $row['id']; ?></td>
      <td><?php echo $row['name']; ?></td>
      <td><?php echo $row['phonenumber']; ?></td>
      <td><?php echo $row['category']; ?></td>
      <td><?php echo $row['package']; ?></td>
      <td><?php echo $row['date']; ?></td>
      <td><?php echo $row['time']; ?></td>
    </tr>
  </tbody>
</table>
```

Figure 20: Code Segment for Administration Module for Admin

The packages and Services module in RJ Studio will allow the customers to view all the services, and packages provided by RJ Studio, including their details and pricing. For admin, this module will allow them to view, add, update, and delete all the services and packages available at RJ Studio.



Figure 21: Packages and Services Module for Customer

```

class HomePage extends StatefulWidget {
  @override
  _HomePageState createState() => _HomePageState();
}

class _HomePageState extends State<HomePage> {
  String name = '';
  String email = '';
  int locate = 0;

  @override
  void initState() {
    super.initState();
    WidgetsBinding.instance?.addPostFrameCallback((_) {
      _get();
      setState() {
        build(context);
      });
    });
  }
}
    
```

Figure 22: Code Segment for Packages and Services Module for Customer

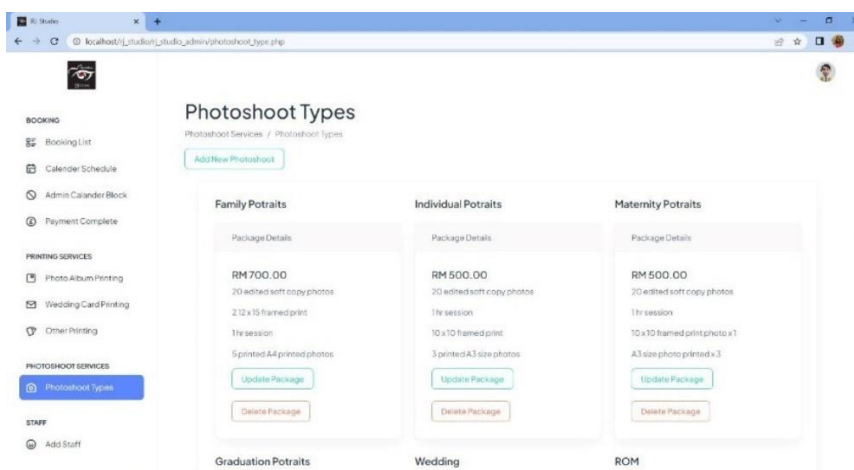


Figure 23: Packages and Services Module for Admin

```

<?php
$sql = "SELECT * FROM photoshoot_services ";
$result = mysqli_query($conn, $sql);
if (mysqli_num_rows($result) > 0) {
    while ($row = mysqli_fetch_assoc($result)) {
        ?>
        <div class="col-md-4">
            <h5 class="card-title fw-semibold mb-4"><?php echo $row['package_name']; ?></h5>
            <div class="card">
                <div class="card-header">
                    Package Details
                </div>
                <div class="card-body">
                    <h5 class="card-title"><?php echo $row['price']; ?></h5>
                    <p class="card-text"><?php echo $row['line1']; ?></p>
                    <p class="card-text"><?php echo $row['line2']; ?></p>
                    <p class="card-text"><?php echo $row['line3']; ?></p>
                    <p class="card-text"><?php echo $row['line4']; ?></p>
                    <button href="" class="btn btn-outline-success" onclick="update(<?php echo $row['id']; ?>)">Update Package</button>
                    <br><br>
                    <button href="" class="btn btn-outline-danger" onclick="view(<?php echo $row['id']; ?>)">Delete Package</button>
                </div>
            </div>
        </div>
    </div>
</php

```

Figure 24: Code Segment for Packages and Services Module for Admin

The Booking and Scheduling module in a booking application allows customers to select their desired date and time for bookings. For admins, this module provides a calendar view with customer bookings and allows them to manage the availability of RJ Studio by marking unavailable dates.

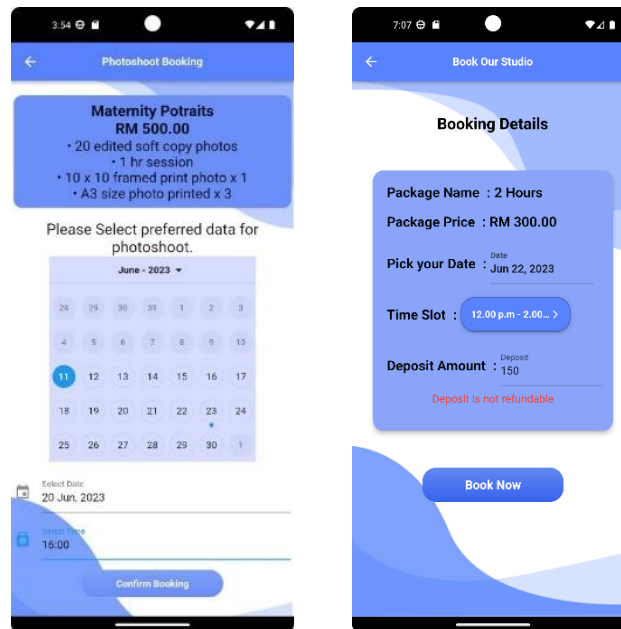


Figure 25: Booking and Scheduling Module for Customer

```

class _Service_BookingState extends State<Service_Booking> {
    var getPackagename = '';
    var getPrice = '';
    var getLine1 = '';
    var getLine2 = '';
    var getLine3 = '';
    var getLine4 = '';

    String date = '';
    String time = '';
    List list = [];

    String dates123 = "2023,06,06" ;
    List<DateTime> _dates = [];
}

```

Figure 26: Code Segment for Booking and Scheduling Module for Customer

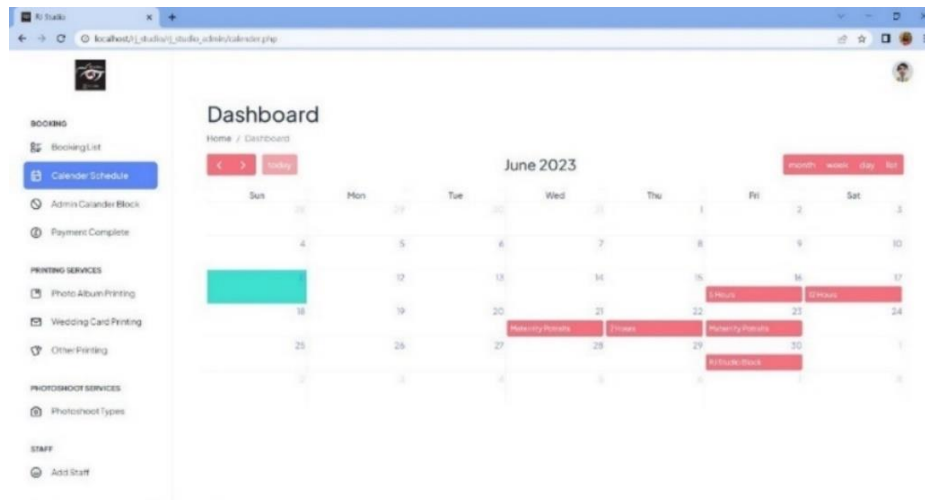


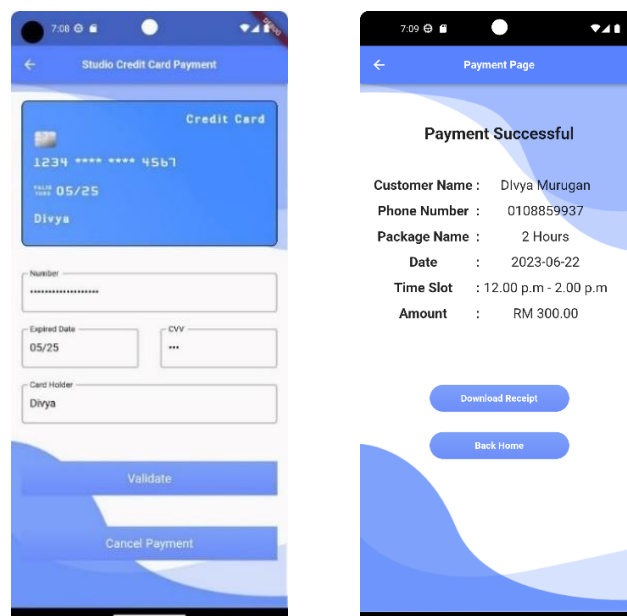
Figure 27: Booking and Scheduling Module for Admin

```

<script>
document.addEventListener('DOMContentLoaded', function() {
var calendarEl = document.getElementById('calendar');
const date = new Date();
var calendar = new FullCalendar.Calendar(calendarEl, {
  plugins: ['interaction', 'daygrid', 'timegrid', 'list'],
  height: 'parent',
  header: {
    left: 'prev,next today',
    center: 'title',
    right: 'dayGridMonth,timeGridWeek,timeGridDay,listWeek'
  },
  defaultView: 'dayGridMonth',
  defaultDate: date,
  navLinks: true, // can click day/week names to navigate views
  editable: true,
  eventLimit: true,
  // allow "more" link when too many events
  events: [
    <?php
    $conn = mysqli_connect("localhost", "root", "", "rj_studio");
    $sql = "SELECT * FROM bookings; ";
    $result = mysqli_query($conn, $sql);
    if (mysqli_num_rows($result) > 0) {
      while ($row = mysqli_fetch_assoc($result)) {
        >
        {
          title: '<?php echo $row['package']; >',
          start: '<?php echo $row['date']; >',
        }
      }
    }
    <?php
  ]
});
calendar.render();
}
</script>
    
```

Figure 28: Code Segment for Booking and Scheduling Module for Admin

The payment module in RJ Charter allows the customers to securely make payments for their appointments. Additionally, the admin can easily track pending payment and access detailed payment information from customers.



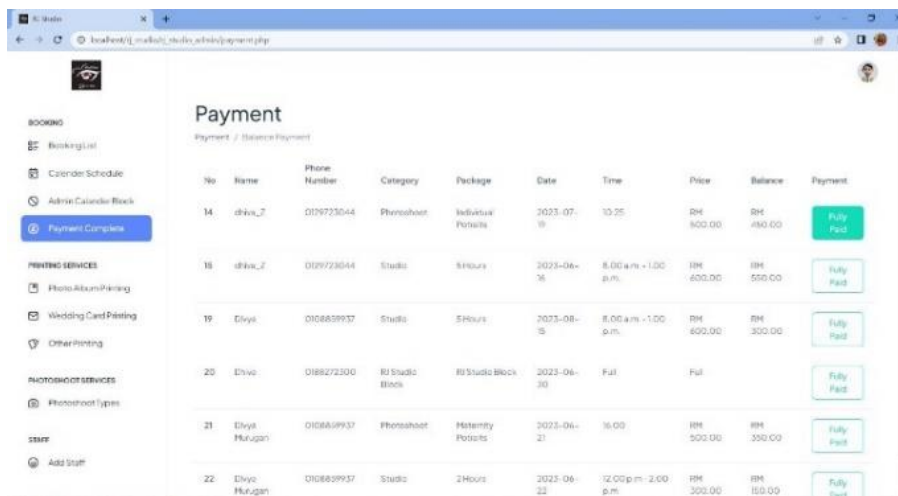
**Figure 29: Payment Module for Customer**

```

class _Credit_CardState extends State<Credit_Card> {
  String cardNumber = '';
  String expiryDate = '';
  String cardHolderName = '';
  String cvvCode = '';
  bool isCvvFocused = false;
  bool useGlassMorphism = false;
  bool useBackgroundImage = false;
  OutlineInputBorder? border;
  final GlobalKey<FormState> formKey = GlobalKey<FormState>();

  String name='';
  String email='';
  String package='';
  String date='';
  String price='';
  String category='Photoshoot';
  String phoneNumber='';
  String time = '';
  String deposit = '';
  String balance = '';
}
    
```

**Figure 30: Code Segment for Payment Module for Customer**



**Figure 31: Payment Module for Admin**

```

<table class="table">
  <thead>
    <tr>
      <th scope="col">No</th>
      <th scope="col">Name</th>
      <th scope="col">Phone Number</th>
      <th scope="col">Category</th>
      <th scope="col">Package</th>
      <th scope="col">Date</th>
      <th scope="col">Time</th>
      <th scope="col">Price</th>
      <th scope="col">Balance</th>
      <th scope="col">Payment</th>
    </tr>
  </thead>
  <tbody>
    <php
    $sql = "SELECT * FROM bookings where balance != 'fully Paid' ";
    $result = mysqli_query($conn, $sql);
    if (mysqli_num_rows($result) > 0) {
      while ($row = mysqli_fetch_assoc($result)) {
        <tr>
          <th scope="row"><php echo $row['id']; ?></th>
          <td><php echo $row['name']; ?></td>
          <td><php echo $row['phonenum']; ?></td>
          <td><php echo $row['category']; ?></td>
          <td><php echo $row['package']; ?></td>
          <td><php echo $row['date']; ?></td>
          <td><php echo $row['time']; ?></td>
          <td><php echo $row['price']; ?></td>
          <td><php echo $row['balance']; ?></td>
          <td>
            <button href="" class="btn btn-outline-success" onclick="update(<php echo $row['id']; ?>)">Fully Paid</button>
          </td>
        </tr>
      </php>
    </tbody>
</table>
    
```

**Figure 31: Code Segment for Payment Module for Admin**

## 4.2 Testing

Testing is of utmost importance in the development of a mobile application [10]. It ensures the stability and reliability of an app by addressing and fixing bugs and errors. Table 6 shows the test case for each module.

**Table 6: Test Case**

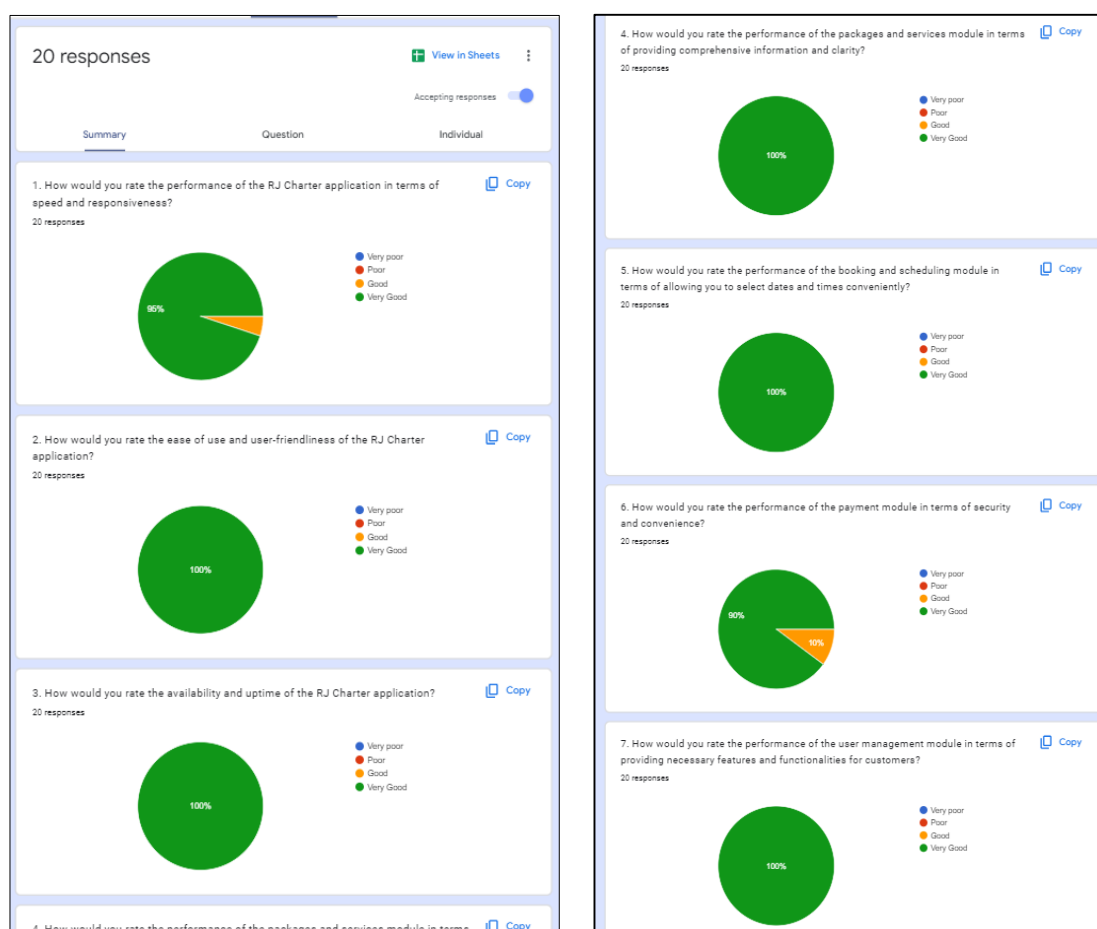
| Test Case ID  | Description  | Expected Result   | Status |
|---|--|---|--------|
| <b>Register Module (TC_100)</b>                           |  |   |        |
| TC_100_01   | Customers click the Signup button after entering all the information required for registration.  | The application should prompt a registered successful message on the screen   | PASS   |
| TC_100_02   | Customer register using an email address that already has been created before.                   | The application should prompt an invalid email message on the screen.   | PASS   |
| TC_100_03   | Customers press the Sign Up button without filling in the required information for registration. | The application should ask the user to fill in all the details required.  | PASS   |
| <b>Login Module (TC_200)</b>                              |  |   |        |
| TC_200_01   | Customers log in to the application without registering.   | The application should prompt an invalid email message on the screen.   | PASS   |
| TC_200_02   | Customer login into the application after successfully registering an account.                   | The application should prompt a successful login message on the screen.   | PASS   |
| TC_200_03   | Customer login into the application by entering the wrong email or password.                     | The application should prompt an error message asking the user to enter the email and password again on the screen. | PASS   |
| TC_200_04   | Admin login into the website by entering username and password.                                  | The system should show a login successful message on the screen and redirects the admin to the homepage.            | PASS   |
| TC_200_05   | Admin clicks login button by entering wrong username or password.                                | The system should prompt an invalid email or password error message at the screen.                                  | PASS   |
| <b>User and Administration Management Module (TC_300)</b> |  |   |        |
| TC_300_01   | Customers click the update button after updating their details.                                  | The application should display the profile successfully updated message on the screen.                              | PASS   |
| TC_300_02   | Admin clicks the save staff button by entering all the details required.                         | The system should display the “Staff added successfully” message on the screen.                                     | PASS   |
| TC_300_03   | Admin clicks the save staff button without entering the required information.                    | The system should display a “Please fill out this field” message on the screen.                                     | PASS   |

| Test Case ID                                  | Description  | Expected Result   | Status |
|---|--|---|--------|
| <b>Packages and Services Module (TC_400)</b>  |  |   |        |
| TC_400_01                                     | Customers click any services or packages.  | The application should display the package details including its pricing.   | PASS   |
| TC_400_02                                     | Admin clicks add a button to add a new package or service.   | The system should ask the user to enter the necessary details to add a service or package.  | PASS   |
| TC_400_03                                     | Admin clicks the save button after entering all the details required.  | The system should display the “Package has been added successfully” message on the screen.  | PASS   |
| TC_400_04                                     | Admin clicks the delete button on any packages or services available at RJ Charter.                            | The system should display a “Are you sure want to delete this package or service” message on the screen.                                      | PASS   |
| <b>Booking and Scheduling Module (TC_500)</b> |  |   |        |
| TC_500_01                                     | Customers click confirm booking button after selecting their preferred date and time for the specific service. | The application should redirect the customer to the payment page.   | PASS   |
| TC_500_02                                     | Admin clicks the “Admin Calendar Block” button.  | The system should display an admin calendar blocking details page for the admin to fill in the required details to block an unavailable date. | PASS   |
| TC_500_03                                     | Admin clicks Submit button after entering all the required details to block an unavailable date                | The system should prompt the “Date has been blocked successfully” message on the screen and calendar.   | PASS   |
| <b>Payment Module (TC_600)</b>                |  |   |        |
| TC_600_01                                     | The user clicks the credit card button after entering a specific amount of money for the deposit.              | The application should redirect to the payment page where the user has to enter credit card details to proceed with the payment.              | PASS   |
| TC_600_02                                     | The Users click the “Cancel Booking” button after selecting a package or service from RJ Studio.               | The application should redirect the customer to the homepage.   | PASS   |
| TC_600_03                                     | The User clicks validate button after entering all the data needed for credit card payment.                    | The application should display the receipt with all the booking details.  | PASS   |
| TC_600_04                                     | Admin clicks the “Fully Paid” button in the system for fully paid customers.                                   | The system should prompt the “The Payment is completed” message on the screen.  | PASS   |

| Test Case ID | Description | Expected Result | Status |
|--------------|-------------|-----------------|--------|
|--------------|-------------|-----------------|--------|

### 4.3 User Acceptance Test

The user acceptance test for the RJ Charter application demonstrated positive feedback from 20 student respondents. The application received high ratings across various aspects, including speed and responsiveness, availability and uptime, comprehensive information and clarity of packages and services, convenient booking and scheduling, secure and convenient payment processing, and effective user management features. The results indicate a high level of satisfaction and success in meeting user expectations, affirming the efficiency, reliability, and user-friendliness of the RJ Charter application.



**Figure 32: User Acceptance Test Result for Customer**

The User Acceptance Test for the RJ Studio admin system yielded excellent results, with all 6 admins rating the system as "very good" in various aspects. The feedback indicated that the system excelled in providing an easy login process, user-friendly navigation, efficient management of customer bookings, seamless handling of studio rentals and equipment, accurate reporting capabilities, and secure payment processing. Overall, admins were highly satisfied with the RJ Studio admin system, highlighting its user-friendliness, functionality, and ability to meet their administrative needs effectively. Figure 33 shows the user acceptance test result for Admin.

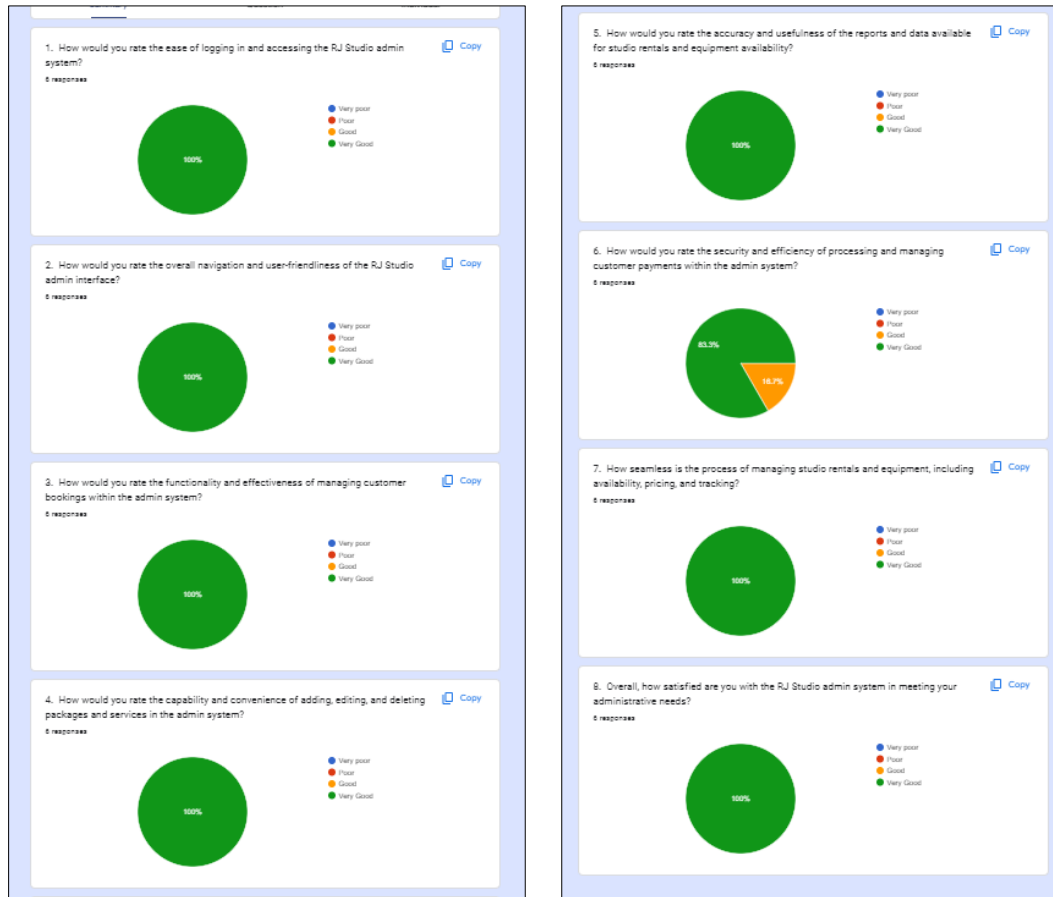


Figure 33: User Acceptance Test Result for Admin

## 5. Conclusion

In conclusion, the development of the RJ Charter, the mobile-based application for RJ Studio Administration and Booking has successfully addressed the challenges faced by the studio in managing their bookings and administrative processes. The project has resulted in a user-friendly mobile-based application that streamlines the booking system, facilitates online payments, and improves overall customer experience. Through an object-oriented approach and rigorous testing, the application has achieved its objectives of providing a structured and scalable system design, utilizing mobile technology and ensuring quality and reliability through alpha and beta testing. With future implementation possibilities such as a refund policy, booking modification feature, enhanced data security, compatibility across platforms, feedback system, and integration with additional services, RJ Charter has the potential to further improve and meet the evolving needs of RJ Studio and its customers. Overall, this project has proven to be a successful solution that enhances efficiency, customer satisfaction, and the overall management of RJ Studio.

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