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**BATANGAS STATE UNIVERSITY**  
**The National Engineering University**  
**Lipa Campus**

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# **In Partial Fulfillment of the Requirements in CS 211 - Object-Oriented Programming**

By: Group 1

Briones, Carvey Adrian

Carabeo, Aira-joy A.

Levita, Reymark A.

Protestante, Louisa Victoria C.

Untalan, Princess Althea Mae S.

DECEMBER 2024



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## College of Informatics and Computing Sciences

### IT System Project Document

#### 1. Project Overview

- **Project Title:** Velora: A Smart and Sustainable Hotel Reservation System for Responsible Tourism
- **Project Description:** Velora is an innovative hotel reservation and management system designed to streamline operations, enhance guest satisfaction, and promote sustainable tourism practices. It serves both hotel staff and guests with features tailored to efficient reservation handling, room management, and an enhanced guest experience, all while aligning with key Sustainable Development Goals (SDGs).
- **Group Members:**

Briones, Carvey Adrian - TL / Developer / Quality Tester

Carabeo, Aira-joy A. - Developer / Quality Tester

Levita, Reymark A. - Developer / UI Designer / Documentation Coordinator / Quality Tester

Protestante, Louisa Victoria C. - Developer / Quality Tester

Princess Althea Mae S. Developer

- **Client Group** - Group 3
- **Developer Group** - Group 1
- **Date of Agreement:** November 8, 2024
- **Document Version:** Version 4.0 - (*Last Updated: December 13, 2024*)

#### 2. Project Goals and Objectives

##### Primary Objective

The primary goal of Velora is to develop a seamless, secure, and highly intuitive platform that revolutionizes hotel operations by integrating reservation management, room allocation, and guest interactions into a unified, efficient digital interface. This system is meticulously designed to meet the unique requirements of our client while promoting sustainable practices in the hospitality industry.

Aligned with the **Sustainable Development Goals (SDGs)**:

- **SDG 8 Decent Work and Economic Growth:**
  - The system enhances operational productivity by automating manual tasks, reducing human error, and freeing up staff to focus on delivering exceptional guest experiences.
  - By improving accuracy in billing and resource allocation, the system supports the hotel's long-term economic growth and promotes job satisfaction for staff through simplified workflows.
- **SDG 9 Industry, Innovation, and Infrastructure:**
  - Through the adoption of cutting-edge technology, the system fosters resilience and innovation in hotel operations. Real-time data management, advanced database integration, and payment

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processing ensure efficient use of resources, contributing to the modernization of hospitality infrastructure.

- **SDG 12 Responsible Consumption and Production:**

- The system minimizes environmental impact by optimizing housekeeping schedules, reducing unnecessary energy consumption, and promoting paperless operations through digital invoicing and confirmations. By streamlining processes and conserving resources, the system aligns with global sustainability efforts.

### **Additional Objectives**

To elevate guest satisfaction and maximize system performance, the following enhancements will be incorporated:

- Enhanced Data Security:
  - Implementation of robust encryption for data at rest and in transit, alongside secure password hashing protocols, ensures guest information is protected.
  - Compliance with data protection standards (e.g., GDPR) to safeguard sensitive data and build trust with users.
- Advanced Room and Resource Management:
  - Real-time room availability updates allow for accurate bookings, reducing the likelihood of overbooking.
  - Integration of housekeeping and maintenance tracking ensures efficient resource allocation, supporting SDG 12 by reducing waste and prioritizing sustainability.
- User-Centric Design and Experience:
  - Development of a user-friendly graphical user interface (GUI) designed for easy navigation by both guests and hotel staff.
  - Streamlined workflows for booking, billing, and guest management, reducing time and effort while improving user satisfaction.
- Scalable Payment Integration:
  - Support for multiple payment methods, including credit cards, GCash, and PayMaya, ensures flexibility and convenience for guests.
  - Future-ready design to accommodate upgrades for advanced payment gateways and additional digital wallet options.
- Notifications and Real-Time Updates:
  - Automated notifications for guests, such as booking confirmations and check-in reminders, ensure smooth communication.
  - Real-time status updates for admins on housekeeping, room availability, and pending tasks improve operational oversight.
- Future Scalability:
  - The system is designed with scalability in mind, allowing for future integration of advanced features like in-depth reporting and data analytics.



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- Modular architecture enables seamless upgrades without disrupting current functionalities.

By achieving these objectives, the Velora Hotel Reservation and Management System aims to set a new standard in hotel management, delivering a superior experience for both staff and guests while aligning with global sustainability goals. The system not only fulfills immediate client requirements but also establishes a foundation for continuous growth and innovation in the hospitality industry.

### **3. Requirements**

#### **Client Requirements**

##### **Functional Requirements**

###### **1. User Authentication and Authorization**

- Provide a secure login system for staff and guests, with distinct access levels to ensure proper data segmentation and role-based operations.
- Utilize secure password hashing and encrypted storage for user credentials to protect sensitive information.

###### **2. Room Management (Admin)**

- **CRUD Operations:** Enable admins to create, read, update, and delete room records efficiently.
- **Room Information Storage:** Maintain details like room type, capacity, price, and status (Available, Occupied, Under Maintenance).

###### **3. Reservation Handling (Admin)**

- Allow admins to create new reservations by collecting guest details, check-in/check-out dates, and selecting appropriate rooms.
- Provide functionalities to modify or cancel existing reservations following hotel policies.
- Include an integrated availability checker to avoid double bookings for specific dates.

###### **4. Guest Management (Admin)**

- Enable CRUD operations for guest profiles, capturing details like full name, contact information, and preferences (e.g., room type or special requests).

###### **5. Pricing and Billing (Admin)**

- Allow admins to manage room rates, apply seasonal pricing adjustments, and set discounts.
- Calculate total costs for reservations, including taxes and optional services, and generate detailed invoices.
- Provide payment processing for credit cards, GCash, and PayMaya, ensuring seamless transactions.



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## **6. User Interface (Admin)**

- Design an intuitive graphical interface (GUI) for admins to manage reservations, rooms, guests, and housekeeping tasks.
- Ensure the interface includes clearly labeled buttons, real-time feedback, and navigational shortcuts.

## **7. Housekeeping Management (Admin)**

- Track room cleaning statuses (Clean, In Progress, Needs Cleaning).
- Allow admins to assign cleaning tasks to housekeeping staff and monitor task progress.

## **8. Notifications (Guests)**

- Automatically generate reservation confirmation emails after successful booking.
- Provide reminders for upcoming check-ins and check-outs via email or in-app notifications.

## **9. Payment Integration and Tracking (Admin)**

- Enable payment tracking with detailed fields for payment type (Credit Card, GCash, PayMaya), amount paid, and balance due.
- Allow admins to generate and record payment confirmations for accurate tracking.

## **10. Error Handling and Logging (Admin)**

- Implement robust error handling to display user-friendly error messages for invalid inputs or failed operations.
- Maintain a logging system to track system activities, errors, and transactions for troubleshooting and audit purposes.

## **11. File I/O and Configuration Management (Admin)**

- Include backup and restore functionality for critical data to ensure recovery during failures.
- Allow easy modification of system configurations, such as cancellation policies, pricing rules, and housekeeping schedules.

## **12. Date and Time Handling**

- Use Java's Date and Time API to manage reservation dates, time zones, and automated calculations for accurate booking and availability.

## **13. Data Validation**

- Ensure input validation across all forms to maintain data accuracy, avoid invalid entries, and prevent duplicate bookings.

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## Non-Functional Requirements

### 1. Performance

- System operations, such as room searches and booking creation, must complete within 2-3 seconds for optimal user experience.
- Payment processing must be finalized within 5 seconds to minimize guest wait times.

### 2. Security

- Protect sensitive guest data (e.g., personal information, payment details) with robust encryption methods for data at rest and in transit.
- Enforce role-based access control to limit system access based on user roles (Admin or Guest).
- Hash passwords using industry-standard secure hashing algorithms.

### 3. Usability

- Ensure the GUI is intuitive and easy to navigate, requiring minimal training for admins and guests.
- Provide meaningful error messages with clear instructions for resolving common user issues.

### 4. Scalability

- Design the system to handle increased traffic and operational loads during peak seasons without performance degradation.

### 5. Compliance

- Ensure the system complies with relevant privacy and data protection laws, such as the GDPR, to protect guest information and maintain trust.

## Requirements Traceability

Requirement ID	Requirement Description	Module/Component	Implementation Details	Status	Planned Completion Date	Actual Completion Date
R1	Optional login system for guests and admins	User Authentication Module	Allows guests to proceed without logging in. Admins must log in to access management features.	DONE	12/07/2024	12/09/2024
R2	Room	Room	Admins can create, read,	DONE	11/21/2024	11/22/2024



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	Management CRUD Operations	Management Module	update, and delete room details, including status and pricing.			
R3	Reservation Handling	Reservation Module	Allows creating, modifying, and canceling reservations, tracks check-in/out dates	DONE	11/21/2024	11/23/2024
R4	Guest profile management (optional for guests)	Guest Management Module	Enables admins to store and update guest profiles; optional for guests who prefer not to create an account.	DONE	11/24/2024	12/05/2024
R5	Payment processing and tracking	Billing and Payment Module	Supports payment methods like credit cards, GCash, and PayMaya, with tracking for completed payments.	DONE	12/10/2024	12/12/2024
R6	Notifications for guests	Notification Module	Sends booking confirmations and check-in/check-out reminders to both logged-in users and one-time guests.	DONE	11/25/2024	12/03/2024
R7	Housekeeping task assignment and tracking	Housekeeping Management Module	Tracks room cleaning statuses and allows admins to assign and monitor housekeeping tasks.	DONE	12/10/2024	12/11/2024
R8	Error handling and activity logging	Error Management Module	Displays user-friendly error messages and logs all system activities for troubleshooting and auditing purposes.	DONE	12/10/2024	12/10/2024
R9	Backup and restore functionalities	File I/O Module	Provides options to back up and restore critical system data for reliability and disaster recovery.	DONE	12/11/2024	12/12/2024



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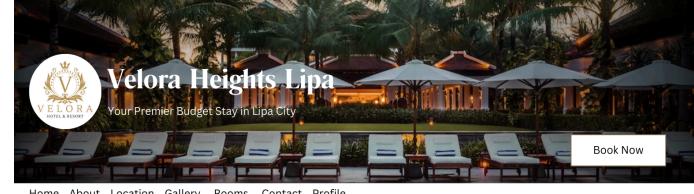
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R10	Room availability checker	Reservation Handling Module	Integrates availability checks during reservation creation to prevent double bookings.	DONE	12/10/2024	12/12/2024
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#### **4. Design and Development**



**Welcome to VELORA Heights Lipa**

Discover the perfect blend of luxury, comfort, and affordability at VELORA Heights Lipa, your premier destination for exceptional accommodations in the heart of Lipa City, Batangas. Whether you're traveling for business or leisure, our hotel offers an unparalleled experience tailored to meet your every need.

**Why Choose VELORA Heights Lipa?**

- Prime Location: Situated in the vibrant and thriving city of Lipa, our hotel provides easy access to key attractions, shopping centers, and dining options.
- Elegant Accommodations: Choose from our carefully designed rooms Deluxe, Executive, and Suite each offering modern amenities and a tranquil ambiance.
- Affordable Luxury: Experience premium services and facilities at prices that won't break the bank.
- Outstanding Hospitality: Our dedicated team ensures your stay is seamless, comfortable, and memorable.

Explore our system to learn more about our offerings and make your reservation today. VELORA Heights Lipa awaits to welcome you with open arms.

**About VELORA Heights Lipa**

At VELORA Heights Lipa, we redefine the standard of hotel accommodations by seamlessly combining style, comfort, and affordability. Nestled in the heart of Lipa City, our hotel serves as a tranquil retreat for travelers seeking convenience and relaxation.

**Our Vision**

To be the leading choice for travelers by providing top-notch service, elegant accommodations, and a memorable guest experience.

**Our Mission**

To create a welcoming environment where every guest feels valued, relaxed, and cared for, ensuring their stay is nothing short of extraordinary.

**Experience the Difference**

With modern facilities, spacious rooms, and exceptional dining options, VELORA Heights Lipa is more than just a hotel; it's your home away from home.



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Your Premier Budget Stay in Lipa City

**Find Us at VELORA Heights Lipa**

VELORA Heights Lipa is conveniently located in the heart of Lipa City, Batangas, making it the perfect starting point for exploring the area's attractions.

Address: Located near SM City Lipa, and Lipa City Hall along President Jose P. Laurel Highway

Plan your visit today and experience unparalleled comfort and convenience. For detailed directions or assistance, feel free to contact us.



**Discover the Beauty of VELORA Heights Lipa**

Browse through our curated gallery to get a glimpse of the elegance and comfort that await you at VELORA Heights Lipa. From our stunning interiors to our cozy rooms and exceptional facilities, let our images tell the story of a truly remarkable stay.

**Rooms**

Experience the comfort of our Deluxe, Executive, and Suite rooms.

**AMENITIES**

Explore our modern amenities, from the cozy lounge areas to our spacious function rooms.

**Dining**

Savor the ambiance and culinary delights of our in-house dining options.

**Surroundings**

Discover the vibrant cityscape of Lipa City just steps from our doors.

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### Elegant Rooms Tailored for Your Comfort

At VELORA Heights Lipa, we offer three distinctive room types to suit every traveler's needs and preferences. Each room is thoughtfully designed with modern amenities and a serene ambiance to ensure a restful stay.

#### Velora Deluxe Room

- Perfect for solo travelers or couples seeking a cozy retreat.
- Features: Queen-sized bed, flat-screen TV, complimentary Wi-Fi, and en-suite bathroom.

**₱5,880 / per night**

[Book Now](#)



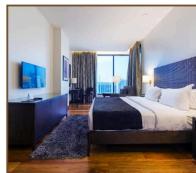
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#### Velora Executive Room

- Ideal for business travelers or small families desiring extra space and comfort.
- Features: King-sized bed, workspace, flat-screen TV, complimentary Wi-Fi.

**₱9,880 / per night**

[Book Now](#)



>

#### Velora Suite Room

- Designed for those who seek the pinnacle of luxury and elegance.
- Features: Separate living area, king-sized bed, premium bathroom amenities, flat-screen TV, complimentary Wi-Fi, and a minibar.

**₱12,880 / per night**

[Book Now](#)



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Reserve your preferred room today and indulge in the VELORA Heights Lipa experience.

### Get in Touch with VELORA Heights Lipa

You may contact us through [Facebook Messenger](#).  
Or fill our the form below and we will reply to you via email.

Name

Email

Type your message here...

[Submit](#)



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**Welcome to Velora Hotel's Guest Portal**

For a seamless booking experience, please log in to your account. Don't have an account? Creating one takes just a moment and offers exclusive benefits!

Email Address:

Password:

[Create Account](#)

[Log In](#)

[Forgot Password](#)

**Create Your Account**

Join to Velora Hotel for a personalized booking experience. Save your preferences, manage your reservations, and enjoy exclusive offers.

Full Name:

Email Address:

Password:

Confirm Password:

[Create Account](#)

**Reservation Details**

Your Journey Begins Here: Review and Confirm Your Stay with Velora Hotel.

Full name:

Contact number:

[Confirm](#)

**Your Booking Details:**

Room Type:

Check-In Date:

Check-Out Date:

Total Price:

[Pay Now](#)

[Back](#)

**Find Your Perfect Stay at Velora Hotel**

Welcome to your reservation portal! Discover your ideal room, manage your bookings, and prepare for an exceptional stay with us.

Check-in date:  [Calendar](#)

Check-out date:  [Calendar](#)

[Search Availability](#)

[Back](#)

**Welcome to Payment Information**

Choose your preferred payment method to secure your stay. Select from Credit Card, GCash, or PayMaya to complete your reservation effortlessly and securely. Your comfort and convenience are our top priority.

[Credit Card](#)

[GCash](#)

[Pay Maya](#)

[Back](#)

**Credit Card Payment**

You've selected Credit Card as your payment method. Please provide your card details below to securely complete your transaction. Rest assured, your information is protected with our advanced security measures.

Credit Card Number:

Credit Cardholder Name:

Expiry Date:

CVV:

[Confirm Payment](#) [Cancel](#)

[Back](#)



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**GCash Payment**

You've chosen GCash as your payment method. Please scan the QR code below to complete your payment. Enjoy a fast, secure, and seamless transaction with GCash!

GCash Name:

GCash Number:

Amount to Pay:



Pay Now

Back

**PayMaya Payment**

You've chosen PayMaya as your payment method. Please scan the QR code below to complete your payment. Experience effortless and secure payment with PayMaya!

Louisa Victoria Protestante  
+63 917 123 8899



GCash Name:

GCash Number:

Amount to Pay:

Pay Now

Back

**Booking Confirmed!**

Thank you for choosing Velora Hotel! We are delighted to confirm your booking.

Booking Reference Number: VELORA-20241114-12345

Room Type:

Check-In Date:

Check-Out Date:

Payment Method:

Total Price:

Download Confirmation

Close

## ADMIN INTERFACE

**Welcome to the Velora Hotel Admin Portal!**

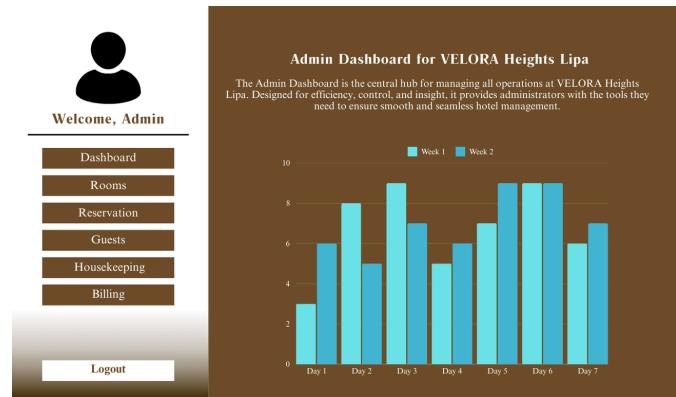
Please log in to access management tools, view reservations, and oversee hotel operations. Your secure login helps us maintain a smooth experience for our guests. Enter your credentials below to begin.

Username:

Password:

Log In

Forgot Password



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Welcome, Admin

Logout

Room Number	Room Type	Capacity	Status	Actions
6	Velora Deluxe Room	2	Occupied	<a href="#">Edit</a> <a href="#">Delete</a>
2	Velora Executive Room	2	Available	<a href="#">Edit</a> <a href="#">Delete</a>
4	Velora Suite Room	2-3	Under Maintenance	<a href="#">Edit</a> <a href="#">Delete</a>
5	Velora Deluxe Room	3-6	Available	<a href="#">Edit</a> <a href="#">Delete</a>

Add New Room

Welcome to the Room Management Panel

Here you can view, edit, and manage room details, including room number, type, capacity, status, and available actions. Effortlessly keep your rooms organized and ready for guests.

Guest Name	Contact Information	Preferences	Action
Reymark Levita	reymark.levita@gmail.com	Non-Smoking & King Bed	<a href="#">Edit</a> <a href="#">Delete</a>
Louisa Protestante	louisa.protestante@gmail.com	Smoking Room & Early Check-In	<a href="#">Edit</a> <a href="#">Delete</a>
Althea Untalan	althea.untalan@gmail.com	Accessible & Late Check-Out	<a href="#">Edit</a> <a href="#">Delete</a>
Aira Carabeo	aira.carabeo@gmail.com	Non-Smoking & Late Check-In	<a href="#">Edit</a> <a href="#">Delete</a>

Add Guest

Welcome, Admin

Logout

Guest Name	Room Number	Check-in Date	Check-out Date	Status	Actions
Reymark Levita	101	November 16, 2024	November 18, 2024	Confirmed	<a href="#">Edit</a> <a href="#">Cancel</a>
Louisa Protestante	406	November 20, 2024	November 23, 2024	Pending	<a href="#">Edit</a> <a href="#">Cancel</a>
Althea Untalan	205	December 1, 2024	December 4, 2024	Confirmed	<a href="#">Edit</a> <a href="#">Cancel</a>
Aira Carabeo	304	December 8, 2024	December 11, 2024	Cancelled	<a href="#">Edit</a> <a href="#">Cancel</a>

New Reservation

Welcome to Reservation Management

Here you can easily create, update, and manage guest reservations. View details such as guest names, check-in/check-out dates, room assignments, and reservation status. Streamline your booking process and ensure a seamless guest experience.

Room Number	Room Type	Status	Assigned Staff	Duration
002	Velora Deluxe Room	Under Maintenance	Rey	9:00 PM - 10:00 PM
007	Velora Executive Room	Under Maintenance	Mark	7:00 PM - 8:30 PM
006	Velora Suite Room	Under Maintenance	Levi	7:30 PM - 9:00 PM
001	Velora Deluxe Room	Under Maintenance	Elie	6:00 PM - 10:00 PM

Welcome, Admin

Logout

Guest Name	Contact Information	Preferences	Action
Reymark Levita	reymark.levita@gmail.com	Non-Smoking & King Bed	<a href="#">Edit</a> <a href="#">Delete</a>
Louisa Protestante	louisa.protestante@gmail.com	Smoking Room & Early Check-In	<a href="#">Edit</a> <a href="#">Delete</a>
Althea Untalan	althea.untalan@gmail.com	Accessible & Late Check-Out	<a href="#">Edit</a> <a href="#">Delete</a>
Aira Carabeo	aira.carabeo@gmail.com	Non-Smoking & Late Check-In	<a href="#">Edit</a> <a href="#">Delete</a>

Add Guest

Welcome to the Guest Management Panel

Here you can view, edit, and manage guest profiles. Easily add new guests, update their information, or delete profiles as needed.

Room Number	Room Type	Status	Assigned Staff	Duration
002	Velora Deluxe Room	Under Maintenance	Rey	9:00 PM - 10:00 PM
007	Velora Executive Room	Under Maintenance	Mark	7:00 PM - 8:30 PM
006	Velora Suite Room	Under Maintenance	Levi	7:30 PM - 9:00 PM
001	Velora Deluxe Room	Under Maintenance	Elie	6:00 PM - 10:00 PM

Add New Room

Welcome, Admin

Logout

Room Number	Room Type	Status	Assigned Staff	Duration
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007	Velora Executive Room	Under Maintenance	Mark	7:00 PM - 8:30 PM
006	Velora Suite Room	Under Maintenance	Levi	7:30 PM - 9:00 PM
001	Velora Deluxe Room	Under Maintenance	Elie	6:00 PM - 10:00 PM

Add New Room

Welcome, Admin

Logout

Rate Management	Payment Tracking	Payment Method
Standard Room Rate	Guest Name:	Payment Type:
Seasonal Rate:	Room Number:	Transaction ID:
Discount:	Total Payment Due:	Record Payment
Apply	Deposit Paid:	
	Remaining Balance:	Mark As Paid

Welcome to the Billing and Payment Management

At the top center, providing a clear indication of the panel's purpose.

Rate Management	Payment Tracking	Payment Method
Standard Room Rate	Guest Name:	Payment Type:
Seasonal Rate:	Room Number:	Transaction ID:
Discount:	Total Payment Due:	Record Payment
Apply	Deposit Paid:	
	Remaining Balance:	Mark As Paid



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## **5. Project Plan**

### **1. Development Timeline (6 Weeks)**

The development of the **Velora Hotel Reservation System** is structured across six weeks, with each phase addressing specific features and functionalities as defined in the wireframe.

#### **Week 1: Wireframe Analysis and System Design**

- **Activities:**
  - Analyze the provided wireframe to finalize system workflows and architecture.
  - Create detailed UI designs for all interfaces (Login/Create Account, Role Selection, Booking, Admin Dashboard).
  - Establish navigation structure based on user roles (Client/Admin).
- **Deliverables:**
  - System Design Document.
  - Finalized Wireframe Analysis Report.
  - UI Layouts for all core screens.

#### **Week 2: Database and Core Backend Setup**

- **Activities:**
  - Design and implement the database schema for managing reservations, rooms, guests, and payments.
  - Configure data handling operations for room availability, user accounts, and booking details.
  - Implement basic data validation to maintain database integrity.
- **Deliverables:**
  - Functional Database Schema (e.g., MySQL/PostgreSQL).
  - Backend structure for data retrieval and storage.

#### **Week 3: Core Module Development**

- **Activities:**
  - Develop and integrate the **Client Interface**:
    - Booking search functionality for check-in/check-out dates.
    - Room selection with room details, images, and pricing.
  - Implement the **Admin Interface**:
    - Basic Room Management CRUD operations.
    - Initial setup of the reservation and guest management modules.
- **Deliverables:**
  - Functional Client Booking Module.

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- Admin Room and Guest Management Panels (basic version).

#### **Week 4: Advanced Features and Payment Integration**

- **Activities:**

- Enhance the Client Interface:
  - Implement reservation summary and payment screens.
  - Add support for payment methods (Credit Card, GCash, PayMaya) with validation.
- Expand Admin Interface:
  - Enable reservation modifications and cancellations.
  - Track payments and generate invoices.
- Introduce housekeeping management for admins (task assignment and status tracking).

- **Deliverables:**

- Complete Payment Integration.
- Advanced Admin Reservation and Billing Modules.
- Functional Housekeeping Management System.

#### **Week 5: Integration and End-to-End Testing**

- **Activities:**

- Integrate all client and admin features into a cohesive system.
- Conduct comprehensive testing to ensure:
  - Room availability updates correctly reflect real-time data.
  - Payment processes operate securely and reliably.
  - Admin panels function across all modules (rooms, guests, housekeeping).

- **Deliverables:**

- System Integration Report.
- Detailed Bug List for correction.

#### **Week 6: User Testing, Feedback, and Final Refinement**

- **Activities:**

- Perform **User Acceptance Testing (UAT)** with stakeholders to ensure the system aligns with real-world requirements.
- Refine features based on user feedback, focusing on usability and accuracy.
- Prepare the system for deployment by addressing final bugs and polishing the user interface.

- **Deliverables:**

- Updated and Tested Final System.
- UAT Feedback Report with action items addressed.

## **2. Testing and Quality Assurance**

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## Testing Phases

- **Unit Testing:**
  - Validate individual features (e.g., room booking, payment submission) during development.
  - Ensure data accuracy and input validation for all forms.
- **Integration Testing:**
  - Verify that modules (e.g., Client Booking, Admin Management) interact seamlessly.
  - Test workflows, such as a guest booking a room and admins tracking the reservation.
- **User Acceptance Testing:**
  - Collaborate with the Client Group to validate the system's functionality and usability.
  - Address stakeholder feedback to refine key components.

## 6. Testing Plan and Results

In Week 6, the Client Group participated in a comprehensive testing phase for the Velora Hotel Reservation System to validate its functionality, usability, and alignment with project requirements. This phase was critical in ensuring the system meets user expectations and operates seamlessly across all components. The testing process allowed the Client Group to evaluate features such as optional login, room selection, reservation handling, payment processing, and housekeeping management.

### Testing Summary and Key Feedback

#### 1. Role Selection and Login

- The role selection interface (Client/Admin) and optional login for guests were tested extensively.
- Feedback: The feature was intuitive, allowing guests to proceed without logging in while maintaining secure admin access.
- Resolution: No issues were reported, and this functionality was marked as complete and user-friendly.

#### 2. Room Selection and Filtering

- The room selection interface, including room details, pricing, and filters, was evaluated.
- Feedback: The Client Group praised the visual clarity of room options. However, they suggested enhancing filter usability, as some labels were unclear.
- Resolution: The development team updated filter labels and refined their layout, making it easier for users to search and select rooms.

#### 3. Reservation Creation and Modification

- Reservation workflows were tested to ensure guests could book, modify, and cancel reservations without issues.

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- Feedback: The booking process was smooth, but users experienced difficulty with the date picker interface, leading to occasional errors in selecting check-in and check-out dates.
- Resolution: The date picker was enhanced for improved responsiveness and user-friendliness, ensuring accurate date inputs.

#### **4. Payment Processing and Invoice Generation**

- Payment methods (Credit Card, GCash, PayMaya) were thoroughly tested for functionality and security.
- Feedback: The Client Group confirmed successful processing across all methods, and invoices were generated accurately. No issues were identified in this component.
- Resolution: This section passed testing without requiring adjustments.

#### **5. Housekeeping Management**

- Task assignment and room cleaning status tracking were evaluated for functionality and ease of use.
- Feedback: A logic issue was discovered where certain tasks could not be assigned under specific conditions.
- Resolution: The development team updated the task assignment algorithm, ensuring consistent functionality. This improved the efficiency of the housekeeping module.

#### **6. Error Handling and Logging**

- Error handling was examined for clarity, including testing of invalid inputs and system errors.
- Feedback: The error messages were clear and actionable, contributing to a positive user experience.
- Resolution: No further action was needed, as this component functioned effectively.

The feedback provided by the Client Group was instrumental in refining the system. By addressing usability issues and improving core functionalities, the development team ensured the system was more intuitive and robust for end users. This iterative process highlighted the commitment to delivering a system that exceeds client expectations.

#### **7. Implementation Details**

- **Environment Setup:**
  - **Integrated Development Environment (IDE): Eclipse**
    - The Hotel Reservation and Management System will be developed using *Eclipse*, a robust and versatile Integrated Development Environment (IDE) widely used for Java applications. Eclipse provides an extensive set of features, such as code refactoring, syntax highlighting, debugging, and integrated testing, which make it ideal for developing complex systems like hotel management software. The IDE's support for various plugins



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and tools enhances productivity, enabling the development team to efficiently manage the system's components, from user authentication to reservation handling.

- **Java Version:**
  - The system will be developed using *Java SE 11* or later, leveraging its stability, extensive libraries, and compatibility with JDBC for database integration. Java SE 11 ensures efficient memory management, security, and scalability, which are essential for a secure and reliable reservation system.
- **Database Connectivity:**
  - *Java Database Connectivity (JDBC)* will be used to connect the application to a relational database (e.g., PostgreSQL). JDBC allows the system to perform essential data operations, such as retrieving, inserting, and updating guest and reservation information, ensuring smooth data flow within the system.
- **Additional Libraries and Tools:**
  - JUnit: for unit testing various system functionalities, such as reservation management and user authentication, ensuring code reliability and reducing errors.
  - JavaFX or Swing (optional): for creating a user-friendly graphical interface that enhances interaction with the system's functionalities, providing intuitive forms and visualizations.
  - Maven/Gradle: to manage dependencies and build automation. Using Maven or Gradle with Eclipse will streamline library management and allow for efficient project compilation, testing, and deployment.
- **Version Control System:**
  - *Git* will be used in combination with a platform like GitHub or GitLab for version control. This will allow multiple developers to collaborate efficiently, track code changes, and maintain a history of updates, ensuring that all team members work on the latest version of the project.

## **8. Reflection on Sustainable Development Goals (SDGs)**

- **SDG Alignment Summary:** This Hotel Reservation and Management System contributes to various Sustainable Development Goals (SDGs) by enhancing operational efficiency, improving customer satisfaction, and promoting sustainable business practices. Key SDGs aligned with this project include:
  - **SDG 8 - Decent Work and Economic Growth:**
    - By streamlining hotel operations, automating reservation handling, and reducing manual tasks, the system promotes higher productivity and service quality. This efficiency encourages economic growth in the hospitality sector, helping create a sustainable and profitable environment for businesses and staff. Additionally, the system's automated features support decent work conditions by reducing repetitive tasks for employees, allowing them to focus on guest interaction and satisfaction.
  - **SDG 9 - Industry, Innovation, and Infrastructure:**
    - This system leverages technology to modernize the hospitality infrastructure, employing database connectivity, data security, and payment gateways. Such innovations support



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resilient hotel operations, promote sustainable industry practices, and increase the adaptability of hotel infrastructure in a digital economy.

- **SDG 12 - Responsible Consumption and Production:**

- Through data-driven reporting and housekeeping management, the system encourages responsible resource allocation. Tracking occupancy rates and managing cleaning schedules allows the hotel to optimize resource use, reduce waste, and ensure responsible management of rooms and services.

- **Impact and Future Enhancements:**

- **Advanced Environmental Monitoring:** Implement features to track and report resource consumption (e.g., energy, water usage per room). By analyzing these insights, hotels can adopt more sustainable practices to support SDG 12 further.
- **Digital Check-in/Check-out Options:** To reduce paper waste and streamline processes, integrate digital forms and contactless check-in/check-out, contributing to SDG 9 and SDG 12.
- **Employee Training and Development Tracking:** Integrate modules for tracking employee training and development progress. This feature would align with SDG 8 by promoting skill development and enhancing job satisfaction, ultimately improving the quality of service offered.
- **Enhanced Data Analytics for Business Growth:** Future improvements could include AI-driven data analytics to offer insights into guest preferences and occupancy trends, supporting better decision-making and aligning with SDG 8 and SDG 9.