

TOR 3

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System Analysis & Design

King Mongkut's University of Technology North Bangkok

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Customer's requirements

1.Online Room Booking System

- The customer wants a system that allows room bookings 24/7.
- Users should be able to select check-in and check-out dates.
- The system should display available room types along with their prices.

2.Online Payment

- The system should support payments via credit/debit cards and bank transfers.
- Real-time payment confirmation is required.

3.Customer Profile Management

- Users should be able to create accounts to save personal information and booking history.
- The system should send booking confirmation and check-in notifications.

4.Booking Confirmation and Notification System

- The system should send booking and payment confirmation via email or SMS.

5.Room Reviews and Ratings

-The customer wants a review system where previous guests can leave feedback and ratings for rooms.

6.Post-Booking Management

-The system should allow users to modify or cancel their bookings within a specified timeframe.

7.Promotion Management

-The system should support the use of coupons or discounts during room booking.

8.Data Security

-The customer wants a system with high security standards for protecting personal information and payments.

Functional Requirements

1. Guest Functions

- A guest can search and reserve a room.
- A guest can make payments for reservations.
- A guest can modify and cancel reservations.
- A guest can check in and check out of a room.
- A guest can receive notifications and manage their stay.
- A guest can choose a room and confirm their booking.

2. Booking Functions

- Confirm, cancel, and update booking details.
- Fetch booking status.
- Associate payment with booking.

3. Admin Functions

- Add or remove rooms from the system.
- Generate reports for guests, rooms, and bookings.
- Manage room availability and bookings.

4. Payment Functions

- Process payments.
- Check payment status.

5. Staff Functions

- Manage room availability.
- Handle check-in and check-out processes.
- Generate reports.

6.Notification Functions

- Send and receive notifications for guests and staff.
- Update notification statuses.

Non-Functional Requirements

1. Performance

The system must efficiently handle concurrent access from multiple users (guests, staff, and admin) without significant delays or performance degradation.

Database queries should be optimized to ensure minimal response time, especially during peak periods.

2. Scalability

The system must be scalable to support more users, rooms, and bookings as the business grows.

3. Reliability

Ensure 99.9% uptime with reliable booking, payment, and notification processing. Data between bookings and payments should remain consistent.

4. Security

Use encryption for sensitive data. Implement role-based access so guests, staff, and admins have appropriate permissions.

5. Usability

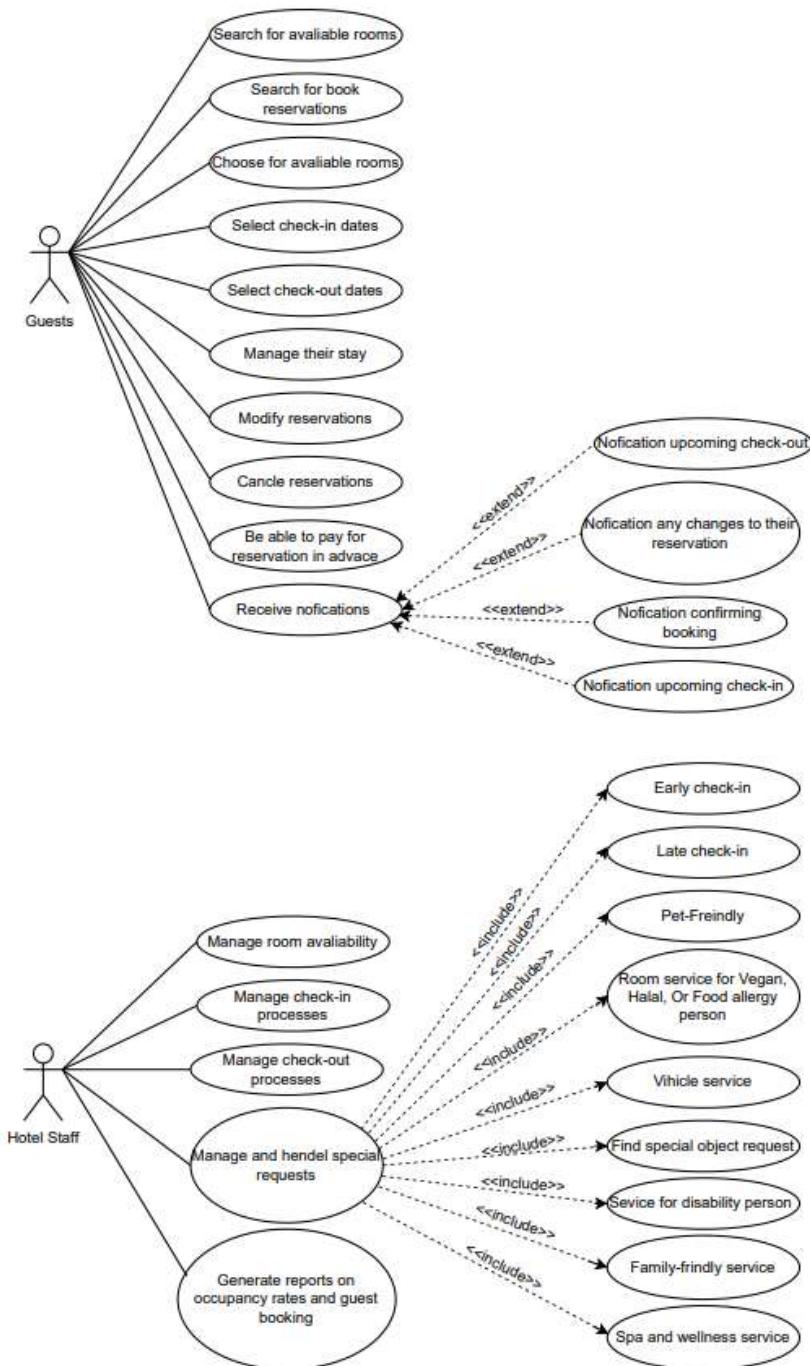
Provide an intuitive interface with clear error messages and support for both desktop and mobile devices.

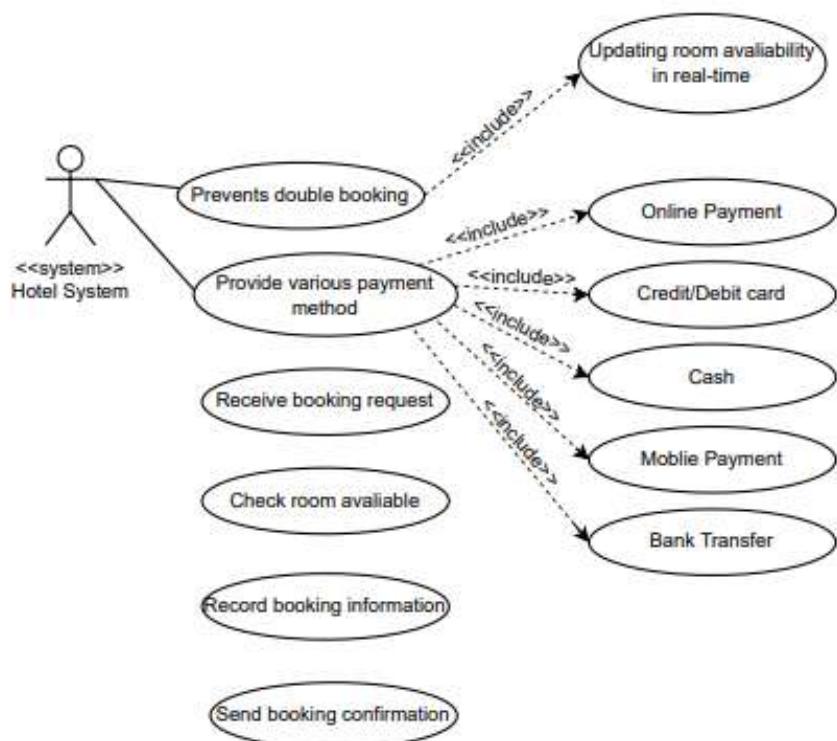
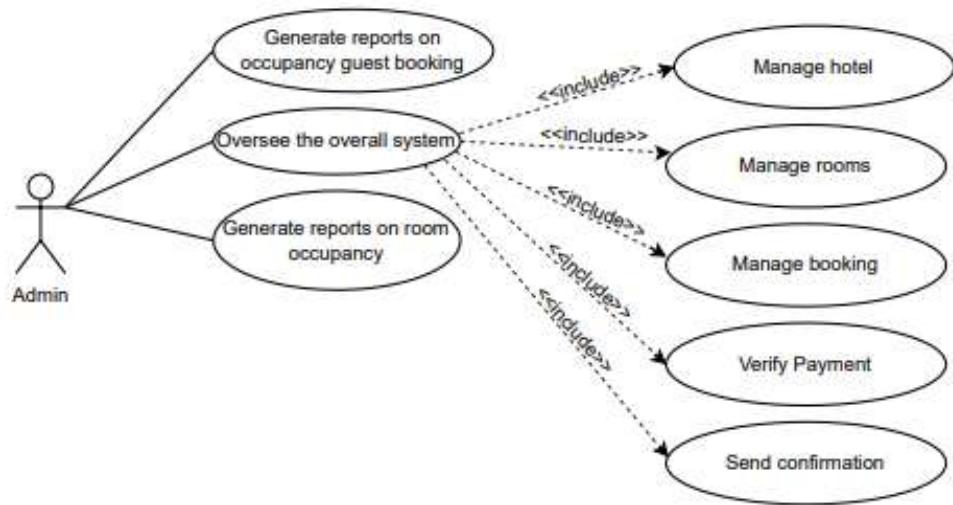
6. Maintainability

The system should be easy to maintain and extend, allowing new features to be added without disrupting existing functionality.

UML

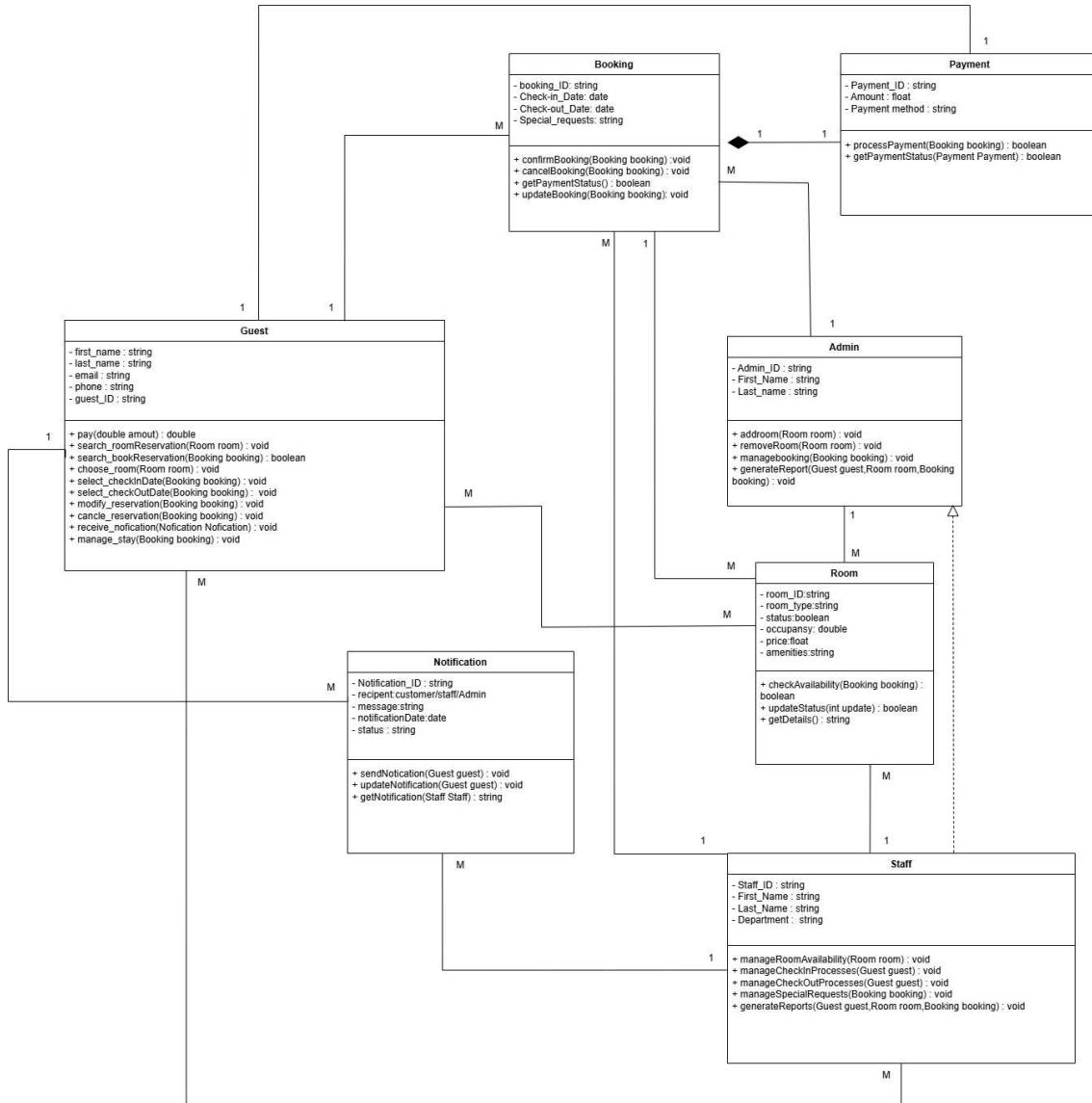
Use Case





- Guests: Search for rooms, manage reservations, pay in advance, and receive notifications
- Hotel Staff: Manage room availability, check-in/out processes, special requests, and generate reports on bookings.
- Admin: Oversees the system, manages rooms and booking, verifies payments, and generates reports.
- Hotel System: Prevents double bookings, updates room availability, processes bookings, and provides various payment options.

Class Diagram



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Relationship

Booking has a one-to-one relationship with Payment, and Payment is a component of Booking, meaning that Payment cannot exist without Booking.

Booking has a many-to-many relationship with both Guests and Rooms.

Guest has a many-to-many relationship with Notification.

Admin has a one-to-many relationship with Room. Admin has a one-to-many relationship with Booking.

Room has a many-to-many relationship with both Booking and Staff.

Room has a many-to-one relationship with Admin.

Staff implement the behaviors of the admin.

Staff has a many-to-many relationship with Notification.

Notification has a many-to-many relationship with both Guests and Staff.

The behaviors of each class

1. Booking

- Confirm, cancel, and update a booking.
- Get payment status.

2. Payment

- Process a payment.
- Get payment status.

3. Guest

- Pay for a booking.
- Search room and booking.
- Choose a room.
- Select check-in and check-out date.

- Modify or cancel a booking.
- Receive notifications.
- Manage stay.

4. Admin

- Add or remove rooms.
- Manage bookings.
- Generate reports.

5. Room

- Check room availability.
- Update room status.
- Get room details.

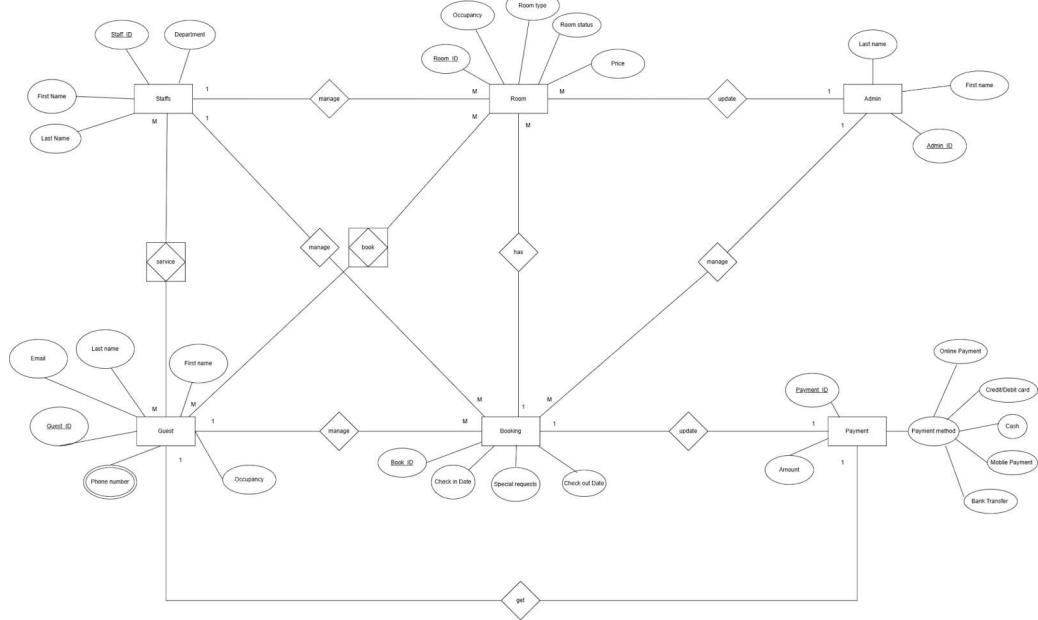
6. Notification

- Send and update notifications.
- Get notifications from staff.

7. Staff

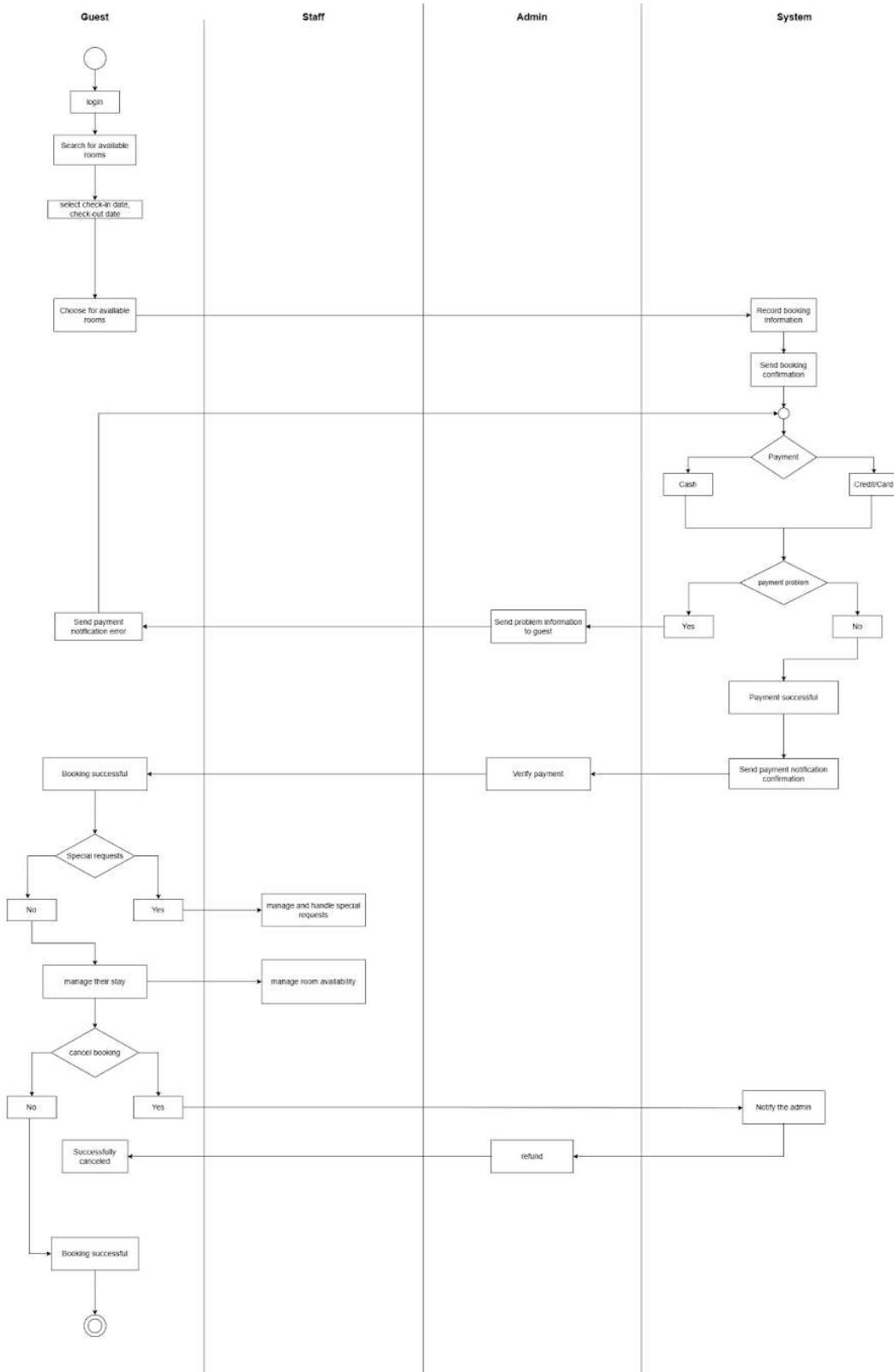
- Manage room availability.
- Manage check-in/out processes.
- Handle special requests.
- Generate reports.

ER diagram



Staff can manage multiple rooms, but each room can only be managed by one staff member. Staff can manage multiple bookings, but each booking can only be managed by one staff member. Staff can service multiple guests, and each guest can be serviced by multiple staff members. Guests can book multiple rooms, and each room can be booked by multiple guests. Guests can manage multiple bookings, but each booking can only be managed by one guest. Guests can get one payment and each payment can only be gotten by one guest. A booking can update one payment, and each payment can only be updated by one booking. Rooms can have multiple bookings, and each booking can only be associated with one room. Admin can update multiple rooms, but each room can only be updated by one admin. Admin can manage multiple bookings, but each booking can only be managed by one admin.

Activity diagram



The swimlane diagram outlines the hotel booking system, showing the interactions between four key roles: Guest, Staff, Admin and System. The Guest logs in, selects a room, and makes a payment. Staff manages guest requests and cancellations. The System processes room availability, payment, confirmations and cancellations. Overall, the diagram demonstrates the smooth workflow of booking, managing and canceling hotel reservations.

UX / UI

User Experience

1. Loading Page

This page shows up when the application is on task and processing, to make sure user will understand application still working

2. Welcome Page

Users will see this page when they open an application. This page makes users feel welcome and increases their experience.

3. Signup Page or Login Page

This page will show up after the Welcome page. Login button is for users who already have an account. And the sign up button is for new users who want to register in the application.

4. Login Page

When users press a login button, this page will appear on their screen. Basically, when users prompt their password. It will not show in string or text. The eye icon is for showing the user password after they type in text-field.

forget password is for users who forget their password.

Or you can login with any social media, in this application we have Facebook, Apple, Gmail.

5. Sign up Page

When new users want to register in this app, if they press a button signup, this Sign up page will show on their screen.

The first text-field is for the user's username and the second text-field is for the user's email address. After that, the password text-field is for the user's password, and the lower password field is for double checking password, to check if the user's password is matching their password or not.

6. Home Page

If users already login in the application, after the Welcome page. This page will be the second page on their screen.

In this page we have changed a language icon and notification icon on the navbar.

7. Offer Page

This page shows up when you press an Offer button in the Home page. This page will show many offers for users. and they can use it if they match in any offer category.

8. Promotion Page

Users can check when rooms are discounted. and if they want to check-in in any discounted room, they can press a picture of any room they want to check-in.

9. Photo & Video Page

This page shows an overview of the hotel. This page will show up after users press a photo & video button on the Home page.

10. Location Page

Location page will show up after users press a location room in the Home page. This page will show the location near to a hotel. and a map for users who are looking for hotel locations.

11. Room Page

The Room page shows up when you press a Room button in the Home page. Users can search for a name of a room, check if it's available, like a room, check a room in a cart.

12. Room Detail Page

This page shows up when users choose their room in the Room page. Room detail page has a picture of the room, details of its, and its amenities.

13. Add to cart page

If you users press a cart with a plus icon, the Add to cart page will appear on their screen. In this page users can see room rate, service and price.

14. Check in & Review Page

In this page users can see a review from other users, by pressing a topic you want to know. For user that used to stay in hotel, they can comment and review on this page

15. Select Date Page

After users press a button check-in - check-out in the Check in & Review Page, they can select a date to check-in and check-out.

16. Accessories Page

If users press the edit room button, this page will show up. In this page, users can add special requests in their reservation. such as, extra bed.

17. Special Package Page

For users who are looking for an extra experience while staying at a hotel. They can select these packages in their cart.

18. Cart Page

Users can see overall of payment in this page

19. Payment Page

Users can select payment methods. such as Credit card, Mobile banking,Cash.

20. Confirm Booking Page

After users commit their payment. This page will show up to confirm users about their payment.

21. Tracking Page

After users book their room, they can access this page by press button Tracking in the Home pages.

22. Nofication Page

Users can access this page by pressing the notification button in the Home page. on this page they can check the notification from the hotel.

23. Cancle Booking Page

If users want to cancel their reservation, they can press a button to cancel the booking. This page can be accessed through a Tracking button on The home page.

User Interface

We want to make an overall of this application like old-money, luxury and combined with modern vibe. so the color we choose is not a vivid color. but we will choose a color such as monotone, based color.

We only use vivid color when we want to make it important and easy to see. For example, notifications, like button, cart.

With an icon of this application. when we use a character with serif font. It will make our application more elegant and luxurious. This works with a hotel, luxury brand and others.

We use various fonts in design such as, Ibarra Real Nova, Cairo, Inter. The reason why we use so many fonts is because when users use an application with a repeated font, it could make it look weird and too straight.

When it comes to background color. we select a white and black background. These colors will make other components in our application easy to see.

In this application. We use a lot of icons and pictures to convey to users. Every picture we pick is linked to the purpose of it.

Price

1. Wireframe and Prototype Design

- Cost 600,000 - 1,000,000 THB

2. User Interface Design

- Cost 1,000,000 - 1,500,000 THB

3. User Experience Design

- Cost 600,000 - 800,000 THB

4. Special Function Design

- Cost 600,000 - 800,000 THB

5. Revisions and Testing

- Cost 400,000 - 600,000 THB

Total 3,200,000 - 4,700,000 THB

Maintain

1. Monitoring and Analytics:

- Performance Monitoring: Monitor server speed, page load times, and app response times.
- User Behavior Analysis: Study user interactions to improve UX/UI.
- Error Tracking: Collect and analyze user-reported errors for quick resolution.

2. Issue Resolution:

- Bug Fixing: Address identified bugs promptly.
- Thorough Testing: Rigorously test all fixes to ensure no new issues arise.

3. Updates:

- Software Updates: Keep operating systems and databases up-to-date.
- Feature Updates: Introduce new features or enhance existing ones based on user feedback.
- UI/UX Improvements: Refine design for a more user-friendly and visually appealing experience.

4. Data Backup:

- Regular Backups: Regularly back-up user data and bookings.
- Restore Testing: Test the backup and restore process to ensure data can be recovered if needed.

5. Security:

- Security Patches: Apply security patches to protect against threats.
- Vulnerability Assessment: Conduct regular assessments to identify risks.
- Access Control: Implement strict access controls to protect sensitive user data.