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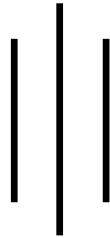
Simalchaur, Pokhara, Nepal

A Project Report

On

“Hamro Booking Sewa”

(Hotel Booking Application)



Submitted to:

LA Grandee International College

Bachelor of Computer Application (BCA) Program

In partial fulfilment of the requirements for the degree of BCA under

Pokhara University

Submitted by:

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We are also appreciative among each other and have understood that teamwork, the designation of the task per the skillset one portrays, constant synchronisation and monitoring of progress and instilling new knowledge and skill is imperative for the success of any given work.

Sincerely,

Laxman Parajuli

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STUDENT'S DECLARATION

We hereby declare that we are the only authors of this work and that no sources other than the listed here have been used in this work.

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SUPERVISOR'S DECLARATION

I, hereby recommend that the project “**Hamro Booking Sewa**” done under my supervision by **Mr. Laxman Parajuli, Ms. Sandhya Banstola** and **Mr. Ujjwal Adhikari** during their 8th Semester in the partial fulfillment of the requirement for the degree of **Bachelor of Computer Application** under the affiliation of **Pokhara University** is completed to my satisfaction and be processed for final evaluation.

.....

Mr. Sunil Sapkota

Project Supervisor

Date: 2 July 2024

LETTER OF APPROVAL

We certify that we have examined this report entitled “**Hamro Booking Sewa**”, and are satisfied with the project defense. In our opinion it is satisfactory in the scope and qualify as project in partial fulfillment of the requirements for the degree of **Bachelor of Computer Application** under **Pokhara University**.

.....

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ABSTRACT

Hotel is a company that provides accommodation services and provides other facilities that meet the requirements of comfort and commercial purposes. The development of the times and technology, also affects the development of the hotel. The use of hotel reservation technology makes it easier for the hotel booking process. Service quality, trustworthiness, facilities and security affect hotel selection decisions.

Hotel booking applications have revolutionized the way people make travel arrangements. These mobile applications provide users with the convenience of booking a hotel room anytime, anywhere. With just a few taps on their smartphones, users can browse through a wide selection of hotels, compare prices, read reviews, and make a reservation within minutes. The application also offers users the option to choose their preferred room type, view room availability, and even make special requests, such as extra amenities or early check-in.

One of the key features of a hotel booking application is its user-friendly interface. The application is designed to be easy to navigate, with intuitive search filters that allow users to quickly find the perfect hotel that suits their preferences and budget. Additionally, many hotel booking applications offer loyalty programs or special deals for frequent users, encouraging them to continue using the application for their travel needs.

Hotel booking applications have become an indispensable tool for travelers looking to easily and efficiently book accommodation. These applications provide users with a seamless booking experience, allowing them to make reservations in just a few taps on their smartphones. With a wide selection of hotels, user-friendly interfaces, and special deals for frequent users, hotel booking applications have revolutionized the way people plan their travel accommodations.

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ABBREVIATIONS

BCA	Bachelor Of Computer Application
AI	Artificial Intelligence
GDPR	General Data Protection Regulation
SEO	Search Engine Optimization
AR	Augmented reality
VR	Virtual Reality
ISO	International Organization for Standardization
DSS	Decision Support System
QA	Quality Assurance
UI	User Interface
UX	User Experience
ER	Entity Relationship
DFD	Data Flow Diagram
API	Application Programming Interface
UAT	User Acceptance Testing
STLC	Software Testing Life Cycle
PHP	Hypertext Preprocessor
Wi-Fi	Wireless Fidelity
UML	Unified Modeling Language

1. INTRODUCTION

Hamro Booking Sewa is a laravel and react native based android application project on online hotel booking where users can view, select and book hotel. The system is fully computerized; the users can book the hotels very easily. The project completely user-friendly to attract more users into the platform.

While this project is being built across different development areas, the primary features included are uploading hotel details by hotel owners and online hotel booking by users. The rooms can also be viewed, selected and reviewed. The project has different modules in the development work, which are divided among super admin, hotel owners, users and registrations option. Some additional features which have been added to make the project more interactive is reviewing hotels by customers.

For today's audiences it's all about immediacy and mobility, the content they are looking for must be just a click away to fit their needs. Now everything is possible. Maybe you want to book a room at your favorite hotel when you are traveling, or maybe each member of your family wants to stay in separate rooms of the hotel. All of these demands are being fulfilled with the help of hotel booking application. Now if you want to view rooms, book hotel rooms and view hotel features you can easily do it wherever you may be.

This hotel booking project in laravel and react native is very unique and different in its approach when compared to the existing projects in the booking segment. The project is built with React Native, a framework of JavaScript for front end and PHP framework Laravel for backend. It involves the teamwork of the entire development team.

We have seen a lot of success in the recent times in the online hotel booking with the advent of Internet and our project is targeted to ride on the current trend to reap benefits while meeting the customer's needs.

We have frequently communicated with system features, expectation and resolution of conflicts in requirements as demanded by various users. We have accessed the probable effect of a change with the plan of reducing sudden side effects. Presenting this project in digital platform leads to global connectivity and helps us to improve our application development skills.

2. PROBLEM STATEMENT

- Online hotel booking apps lack transparency in pricing: many apps advertise low rates, only for users to discover hidden fees and additional charges upon booking.
- Online hotel booking apps are often inconsistent in the quality of information provided; users often rely on photos and reviews to make their booking decisions, only to arrive at their destination and find that the reality does not match their expectations.
- Online hotel booking apps may lack customer support and assistance; when problems or issues arise during the booking process or stay at the hotel, users often struggle to get in touch with a representative for assistance.

3. OBJECTIVES

- To improve the user experience and satisfaction by providing a platform where users can browse, compare different hotel options, and find the best deal that suits their budget and preferences.
- To streamline the reservation process by allowing users to reserve rooms at their own convenience, without the need to make phone calls or visit multiple hotels in person.

4. BACKGROUND STUDY

The Internet usage has entirely revolutionized the behavior of people in the way of purchasing goods and services. Nowadays, people begin to shop online as their life become very busy to be able to shop in-store. Hence, the development of mobile phone has rapidly grown to satisfy the need of human being as they start using mobile phone habitually in their daily life. Mobile phone emerges as one of the devices that people always use in their daily life. Hotel booking on the mobile phone has become trends among people who attach very much on the easiness of purchasing that produce a paperless ticket. According to Nielsen global e-commerce report in 2017, more than a half of global online purchasing on fashion products accounted for 58%, travel products or services represented an average 55%, Book, music & stationary represented 50%, IT and mobile accounted for 43% and event tickets is 41% of the total global respondents [1].

The growth of current technology on the mobile phone gives a big opportunity for airlines, travel and tourism companies to attract customers by offering the easiness of purchasing on the mobile application [2]. According to Nielsen Mobile Wallet Syndicated Report in 2016, the vast majority (76%) of Canada smartphone owners have used their mobile phone in purchasing-related activity [3]. A Bronto report in 2016 also highlights that 64% of Americans are shopping more often on their mobile phones [4]. From the combination surveys above shows that purchasing travel products or service is the second most likely purchased product/service in online shopping that attract smartphone users. The tremendous accomplishment of these companies can be interpreted by developing their mobile application that is user-friendly. A lot of similar application has been introduced in the market in order to book flight ticket or hotel. However, that application that has poor usability will not attract the users or customers to use those applications in the future.

Hotel is a company that provides services in the form of accommodation and provides meals and other facilities in hotels for the public that meet the requirements for convenience and commercial purposes in these services. Its role is very important in the scope of tourism, business, and other travel needs. The development of times and technology has also influenced the development of hotels today, where one of them can

easily order and find hotels in an area, only from a smartphone that we have, simply by installing a hotel booking application. We can rest in peace during our journey [5].

The use of hotel reservation technology facilitates the booking, but to be able to determine a hotel has many factors. Service quality, trust, facilities and of course security partially and simultaneously influence hotel selection decisions [6]. Service quality can be said to be satisfactory and the level of security affects financial performance and service quality also affects financial performance, this means that the better the level of security and quality of service, the hotel's financial performance will further improve [7].

The evolution of the hotel industry has been significantly influenced by technological advancements, particularly through the proliferation of hotel booking applications. These applications have revolutionized how travelers search for and book accommodations, offering convenience and accessibility like never before. This study explores the critical elements involved in the development of a successful hotel booking application, drawing insights from industry trends, technological innovations, user experience design, and effective marketing strategies.

To develop a compelling hotel booking application, it is essential to analyze current industry trends and understand the preferences of modern travelers. According to a study by Deloitte [8], travelers today prioritize personalized experiences and seamless booking processes. They seek accommodations that offer unique amenities and cater to specific preferences such as location, price range, and the availability of facilities like Wi-Fi or complimentary breakfasts.

A thorough competitive analysis is crucial to identify gaps in the market and distinguish the application from existing competitors. [9] For instance, while major players like Booking.com and Airbnb dominate the market with their extensive listings and user-friendly interfaces, there remains room for niche applications targeting specific traveler segments or offering unique features such as real-time room availability updates or integration with local experiences and attractions.

The success of a hotel booking application hinges on robust technological foundations. Integration of advanced features such as AI-driven recommendation engines for personalized suggestions, secure payment gateways, and seamless user interfaces are imperative. [10] Research indicates that applications leveraging AI to analyze user

preferences and offer tailored recommendations can significantly enhance user engagement and satisfaction.

User experience design plays a pivotal role in the adoption and retention of users. [11] A user-centric approach involves designing intuitive interfaces, optimizing for mobile platforms, and ensuring accessibility features for diverse user demographics. Studies suggest that applications with streamlined booking processes and visually appealing interfaces tend to attract and retain a larger user base.

Navigating legal and regulatory landscapes is crucial to ensure compliance and build trust among users. Data protection regulations such as GDPR in Europe impose requirements on the handling of user data, emphasizing the need for robust security measures and transparent data policies within the application. [12]

Effective marketing strategies are essential to enhance visibility and attract a broad user base. Techniques such as search engine optimization (SEO), social media marketing, and partnerships with influencers or travel bloggers can significantly boost app downloads and user engagement. [13] Studies highlight the effectiveness of targeted digital marketing campaigns in driving app awareness and adoption.

Choosing the right revenue model is critical for the sustainability of the application. Revenue streams such as commission fees on bookings, subscription-based premium features, or partnerships with hotels for promotional placements can generate steady income. [14] Research indicates that a diversified revenue model aligned with user expectations and market dynamics is key to long-term.

Planning for scalability is essential to accommodate growing user demands and future expansions. This involves anticipating technological advancements, exploring potential partnerships, and adapting to changing market trends. [15] Studies suggest that agile development methodologies and continuous innovation are pivotal in sustaining growth and competitiveness in the dynamic landscape of hotel booking applications.

Incorporating emerging technologies can provide a competitive edge to hotel booking applications. For example, the use of block chain technology for transparent and secure transactions in booking and payment processes can enhance trust among users and reduce transaction costs [16]. Furthermore, leveraging augmented reality (AR) and virtual reality (VR) technologies can offer immersive experiences, allowing users to

virtually tour hotel rooms and facilities before making a reservation, thereby enhancing decision-making and user satisfaction [17]

Data analytics plays a crucial role in understanding user behavior and preferences, enabling personalized recommendations and targeted marketing efforts. By analyzing data on booking patterns, user demographics, and feedback, applications can tailor offerings to individual preferences and improve customer retention [18]. Moreover, predictive analytics can forecast demand trends, optimize pricing strategies, and enhance inventory management for hotels, fostering mutually beneficial relationships between the application and its hospitality partners [19]

Ensuring robust security measures is paramount in building trust among users. Applications must adhere to industry standards for data protection and privacy, such as ISO 27001 certification and compliance with DSS for payment security [20] [21]. Transparent communication of security practices and policies to users can further reinforce trust and encourage adoption of the application [22]

Increasingly, travelers are prioritizing sustainability and ethical practices when choosing accommodations. Integrating features that highlight eco-friendly options or partnerships with sustainable hotels can appeal to conscientious consumers and align with global sustainability goals [23]. Additionally, applications can support local communities by promoting cultural experiences and responsible tourism practices, thereby enhancing their social impact and appeal to socially conscious travelers [24]

Understanding regional variations in traveler preferences and cultural norms is crucial for international expansion and market penetration. For instance, preferences for specific amenities, payment methods, and customer service expectations vary across regions and demographic groups [25]. Tailoring the application's offerings and user interface to accommodate these differences can enhance user satisfaction and market penetration in diverse global markets.

The development of a successful hotel booking application requires a holistic approach that integrates technological innovation, data-driven insights, robust security measures, sustainability practices, and cultural sensitivity. The development of a successful hotel booking application requires a multifaceted approach encompassing market research, technological innovation, user-centric design, regulatory compliance, strategic marketing, revenue optimization, and scalability planning.

5. REQUIREMENT DOCUMENT

Requirement analysis is a crucial phase in the development cycle of a hotel booking application, providing detailed specifications essential for building the system and understanding its behavior. The collection of system requirements is particularly critical as it forms the foundation upon which the entire system is constructed and informs subsequent stages of the development life cycle. The benefits of thorough requirement analysis include:

- **Alignment:** Ensures clear understanding among developers.
- **Preparation:** Helps in avoiding deviations from the project goals.
- **Direction:** Facilitates easier software design and development.
- **Efficiency:** Streamlines coding efforts.
- **Productivity:** Enables accurate budgeting and reduces project costs.

S.N.	Required Component	Description	Priority	Remarks
1	User Authentication	Allows users to securely login/signup	High	Compliance with security standards.
2	Hotel Search and Filters	Provides options to search and filter hotels	High	Essential for user experience.
3	Room Booking	Enables users to book rooms	High	Core functionality.
4	User Reviews and Ratings	Allows users to review and rate hotels	Moderate	Enhances user trust.
5	Admin Dashboard	Provides administrators with control and insights	High	Necessary for management.
6	Reporting and Analytics	Generates reports and analytics on bookings	Moderate	Supports business decisions.

Table 5.1.1: Hotel Booking Component Matrix

Types of Requirements:

1. **Functional Requirements:** These specify the functionalities, behaviors, and objectives the system must achieve. Functions defining system behavior are articulated as behavioral requirements and typically presented through use cases. Examples include user login and real-time monitoring completion times.
2. **Non-Functional Requirements:** Also referred to as system quality requirements, these provide insights into system operations rather than its functionalities. They complement functional requirements by focusing on system architecture to achieve quality goals and enhance system functionalities. Non-functional requirements encompass aspects such as security protocols and data accuracy during hotel booking.

A requirement document for a hotel booking application is an essential tool that outlines all the necessary features, functions, and user interactions that the application must have to meet the needs of its users effectively. This document serves as a roadmap for the development team, ensuring that everyone involved in the project is on the same page and working towards the same goal.

The requirement document clearly defines the target audience for the hotel booking application. This includes identifying the demographics of the users as well as their preferences and needs when it comes to booking accommodation. Understanding the target audience is crucial for designing a user-friendly interface and providing relevant features that attract and retain users.

The document outlines the specific features and functionalities that the hotel booking application offers. This includes search and filter options, booking processes, user registration and profiles, reviews and ratings.

The document includes a detailed description of the user journey for booking accommodation through the application. This includes the steps the user takes from searching for hotels to making a reservation, as well as any interactions with the system along the way. Understanding the user journey is essential for designing a smooth and intuitive user experience.

The document defines the performance and scalability requirements of the hotel booking application. This includes specifications for response times, loading speeds, and system resources, as well as the ability to handle a large number of users and

transactions simultaneously. Performance and scalability are key factors in ensuring the application can meet the demands of its users without experiencing downtime or slowdowns.

The requirement document specifies the testing and QA requirements for the hotel booking application. This includes outlining the types of testing conducted, such as functional, usability, security, and performance testing, as well as the criteria for acceptance and release. Testing is essential for ensuring the application works as intended and is free of bugs and errors.

The document includes a timeline and budget for the development and launch of the hotel booking application. This includes estimating the time and resources needed for each phase of the project, from design and development to testing and deployment. A clear timeline and budget are essential for managing expectations and ensuring the project stays on track.

The requirement document outlines the maintenance and support requirements for the hotel booking application. This includes specifications for ongoing updates and enhancements, as well as user support and troubleshooting. Maintaining the application is essential for ensuring it remains relevant and competitive in the market.

Lastly, the document includes a list of stakeholders and their roles and responsibilities in the development and management of the hotel booking application. This includes the project team, key decision-makers, and any external partners or vendors involved in the project. Clearly defining the roles and responsibilities of each stakeholder is essential for effective communication and collaboration throughout the project.

A requirement document for a hotel booking application is a vital tool for ensuring the successful development and launch of the application. By defining the target audience, features, technical requirements, user journey, security and privacy measures, performance and scalability specifications, testing and QA requirements, timeline and budget, maintenance and support needs, and stakeholder roles and responsibilities, the document provides a comprehensive roadmap for the project. With a well-defined requirement document in place, the development team can work efficiently towards creating a hotel booking application that meets the needs of its users and delivers a seamless and enjoyable booking experience.

6. SYSTEM DESIGN

6.1 Flow Chart

This flowchart outlines the basic steps involved in a hotel booking application, from logging in to selecting a room and making a payment, ensuring a smooth experience for users throughout the process.

1. Start: The process begins.
2. User Login: Users enter their credentials (username and password).
3. Authentication: The system verifies if the login credentials are correct.
4. Login Successful?
 - Yes: Proceed to step 5.
 - No: Return to User Login.
5. Main Menu: Users are presented with options like "Search Hotels," "View Bookings," "Profile," etc.
6. Search Hotels:
 - Users enter their search criteria (location, check-in/out dates, number of guests).
 - The system displays available hotels based on the criteria.
7. Select Hotel: Users choose a hotel from the list.
8. Room Selection: Users select the type of room they want (single, double, suite, etc.).
9. Booking Details: Users confirm booking details (dates, room type, price).
10. Booking Confirmation: Users receive a confirmation message with booking details.
11. End: The process concludes.

➤ Importance

The flowchart of a hotel booking application is essential for the project because:

- **Visual Representation:** It visually outlines the entire booking process, ensuring everyone understands how the application works.
- **Clarity and Understanding:** It provides a clear overview, helping stakeholders grasp the process details easily.
- **Identifying Improvements:** Highlights potential bottlenecks or areas needing improvement before development.
- **Communication Tool:** Facilitates communication among teams, ensuring everyone is aligned on requirements.
- **Testing and Validation:** Guides testing teams in creating test cases to validate the application's functionality.
- **Documentation and Maintenance:** Serves as documentation for future updates and maintenance, preserving the original design intent.
- **Efficient Development:** Breaks down tasks for developers, reducing errors and speeding up development.

6.2 ER Diagram

➤ Entities

1. Customer

- Attributes: Customer ID (primary key), name, email, phone number, address.

2. Booking

- Attributes: Booking ID (primary key), check-in date, check-out date, total price

3. Room

- Attributes: Room number (primary key), room type, price per night, availability.

4. Hotel

- Attributes: Hotel ID (primary key), name, location, rating, amenities.

➤ Relationships

1. Customer books Booking:

- Relationship type: One-to-many (1)
- Description: A customer can make multiple bookings, but each booking is made by exactly one customer.

2. Booking includes Room:

- Relationship type: Many-to-many (M) resolved to 1
- Description: Each booking can include one or more rooms, and each room can be booked multiple times, but for each booking, each room is booked once.

3. Hotel has Room:

- Relationship type: One-to-many (1)
- Description: Each hotel can have multiple rooms, but each room belongs to only one hotel.

➤ **Diagram Representation**

- **Entities:** Represented as rectangles labeled with entity names (Customer, Booking, Room, Hotel).
- **Attributes:** Listed inside the rectangles (e.g., Customer has attributes like CustomerID, name, etc.).
- **Relationships:** Represented with lines connecting relevant entities, with cardinality (1, M) and optional participation (whether each entity is mandatory or optional in the relationship) indicated.

➤ **Importance**

Creating an ER Diagram for a hotel booking application helps project by:

- **Clarifying Structure:** Clearly defining entities, attributes, and their relationships.
- **Facilitating Design:** Providing a blueprint for developers to build the database schema.
- **Enhancing Communication:** Allowing stakeholders to visualize and understand how data flows and interacts within the application.

This diagram serves as a foundational document for developers and stakeholders, ensuring everyone involved in the project has a clear understanding of the system's data model and relationships.

6.3 DFD

A Data Flow Diagram (DFD) is a way to show how data moves through a system. It helps us understand what information is input to the system, how it's processed, and what outputs are produced. DFD is a powerful tool that helps in visualizing and understanding the flow of information within a hotel booking application, ensuring clarity and efficiency in its design and implementation.

Scenario

- External Entity: A customer uses a hotel booking application to reserve a room.
- Process: The booking system checks room availability and confirms the reservation.
- Data Store: Booking details are stored in the system's database.

➤ Importance

Creating a DFD for a hotel booking application is crucial for project because it:

- Ensures Understanding: It ensures that everyone involved in the project understands how data flows through the system.
- Guides Development: It guides developers in building and integrating different parts of the application.
- Supports Planning: It supports planning by identifying dependencies and potential bottlenecks in data processing.

6.3.1 DFD Level 0

DFD Level 0 for Hotel Booking Application

A Data Flow Diagram (DFD) level 0 is an overview that shows the major processes involved in a system and how they interact with external entities. Here's how it applies to a hotel booking application:

➤ External Entities

- Customer: The person who wants to book a hotel room.
- Hotel Staff: Staff members who manage bookings and room availability.

- Online Booking Platform: Websites or apps through which customers can make reservations.

➤ **Processes**

- Book Room: This process involves a customer selecting and booking a room.
- Check Availability: Determines if a room is available for booking on specific dates.
- Manage Booking: Allows hotel staff to update or cancel existing bookings.

➤ **Data Stores**

- Booking Database: Stores information about bookings, such as customer details, room types, dates, and payment status.
- Room Availability Database: Stores current room availability information.
- Customer Database: Stores customer information like names, contact details, and booking history.

➤ **Data Flows**

- Customer Booking Request: Data flow from the Customer to the Book Room process, indicating the customer's request to book a room.
- Availability Status: Data flow from the Check Availability process to the Customer, informing them whether a room is available.
- Booking Details: Data flow from the Book Room process to the Booking Database, storing details of the new booking.
- Booking Confirmation: Data flow from the Booking Database to the Customer, confirming their booking with details.

➤ **Diagram Representation**

- External Entities: Represented as squares labeled with their names (Customer, Hotel Staff, Online Booking Platform).
- Processes: Represented as circles or bubbles labeled with their names (Book Room, Check Availability, Manage Booking).

- Data Stores: Represented as rectangles with labels (Booking Database, Room Availability Database, Customer Database).
- Data Flows: Represented as arrows showing the flow of data between entities, processes, and data stores.

➤ **Importance**

Creating a DFD level 0 for a hotel booking application is important for project documentation because it:

- Provides Overview: Gives a high-level overview of the system's major processes and interactions with external entities.
- Identifies Boundaries: Clearly defines the boundaries of the system and its interactions with users and external systems.
- Supports Planning: Helps in planning the development process by outlining key functionalities and data requirements.

This level of detail helps stakeholders, developers, and designers understand the basic structure and flow of information within the hotel booking application, ensuring clarity and alignment during the project development phase.

6.3.2 DFD Level 1

Moving from DFD level 0 to level 1 involves breaking down each major process into more detailed subprocesses. Let's describe DFD level 1 for a hotel booking application in simple terms:

DFD Level 1 for Hotel Booking Application

➤ Processes

✓ Book Room:

- Capture Booking Details: Collects customer information (name, contact details, preferences).
- Check Room Availability: Verifies if the requested room type is available for the specified dates.
- Calculate Total Price: Calculates the total cost based on room rate, duration of stay, and any additional services.
- Confirm Booking: Finalizes the booking and updates the booking database with the reservation details.

✓ Manage Booking:

- Update Booking: Allows modifications such as change of dates, room type, or cancellation.
- Cancel Booking: Removes the booking from the system and updates availability.

➤ Data Stores

- Booking Database: Stores detailed information about each booking, including customer details, room type, dates, and payment status.
- Room Availability Database: Contains real-time data on room availability, updated whenever a booking is made or canceled.
- Customer Database: Stores customer information such as names, contact details, and booking history.

➤ **Data Flows**

- Customer Booking Request: Data flow from the Customer (external entity) to the Capture Booking Details process.
- Availability Status: Data flow from the Check Room Availability process to the Calculate Total Price process, indicating room availability.
- Booking Confirmation: Data flow from the Confirm Booking process to the Customer, confirming their reservation.

➤ **Diagram Representation**

- Processes: Each process (Capture Booking Details, Check Room Availability, etc.) is represented as a circle or bubble with a clear label indicating its function.
- Data Stores: Each database (Booking Database, Room Availability Database, Customer Database) is represented as a rectangle with a label.
- Data Flows: Arrows show the direction of data flow between processes, data stores, and external entities, with labels indicating what information is being transferred.

➤ **Importance**

Creating a DFD level 1 for a hotel booking application is crucial for project documentation because it:

- Provides Detail: Breaks down the main processes into manageable subprocesses, detailing how data moves through the system.
- Clarifies Functionality: Clearly defines the steps involved in each process, helping developers understand system requirements and functionalities.
- Supports Implementation: Serves as a blueprint for building the system, ensuring all necessary components and interactions are accounted for.

This detailed level of the DFD helps stakeholders and developers grasp the operational flow of the hotel booking application, ensuring effective communication and alignment throughout the project development lifecycle.

6.3.3 DFD Level 2

DFD level 2 dives deeper into the subprocesses identified in DFD level 1, providing more detailed insights into how each function within the hotel booking application operates. Here's a simplified description:

DFD Level 2 for Hotel Booking Application

➤ Processes

- ✓ Capture Booking Details:
 - Receive Customer Information: Collects customer name, contact details, and any special requests.
 - Validate Customer Information: Ensures all required fields are filled correctly.
 - Store Customer Information: Saves validated data in the Customer Database for future reference.

- ✓ Check Room Availability:
 - Retrieve Availability Data: Accesses the Room Availability Database to check room availability.
 - Compare Dates: Compares requested dates with existing bookings to determine room availability.
 - Return Availability Status: Sends availability status (available or unavailable) to the Calculate Total Price process.

- ✓ Calculate Total Price:
 - Retrieve Room Rate: Retrieves the price per night for the requested room type from the Room Database.
 - Calculate Room Charges: Multiplies the room rate by the number of nights booked.
 - Compute Total Price: Adds up room charges and additional fees to determine the total cost of the booking.

- ✓ Confirm Booking:

- Update Booking Status: Marks the room as booked in the Room Availability Database.
- Generate Booking Confirmation: Creates a confirmation message with booking details.
- ✓ Update Booking:
 - Retrieve Booking Details: Fetches existing booking information from the Booking Database.
 - Modify Booking: Allows changes such as adjusting dates, upgrading room type, or adding services.
 - Update Database: Updates the Booking Database with the modified booking details.
- ✓ Cancel Booking:
 - Retrieve Booking Details: Retrieves booking information from the Booking Database.
 - Update Room Availability: Marks the canceled room as available in the Room Availability Database.
 - Remove Booking: Deletes booking record from the Booking Database.

➤ Data Stores

- Booking Database: Stores comprehensive details about each booking, including customer information, room type, dates, and payment status.
- Room Availability Database: Maintains real-time data on room availability, updating as bookings are made or canceled.
- Customer Database: Contains customer information such as names, contact details, and booking history for personalized service.

➤ Data Flows

- Customer Booking Request: Data flow from the Customer (external entity) to processes like Capture Booking Details and Check Room Availability.

- Availability Status: Data flow from the Check Room Availability process to the Calculate Total Price process, providing room availability information.
- Booking Confirmation: Data flow from the Confirm Booking process to the Customer, confirming their reservation with detailed information.

➤ **Diagram Representation**

- Processes: Each subprocess (Receive Customer Information, Retrieve Availability Data, Calculate Room Charges, etc.) is represented as a circle or bubble labeled with its specific function.
- Data Stores: Each database (Booking Database, Room Availability Database, Customer Database) is depicted as a rectangle with a clear label.
- Data Flows: Arrows indicate the direction of data flow between processes, data stores, and external entities, with labels specifying the type of information being transferred.

➤ **Importance**

Creating a DFD level 2 for a hotel booking application is essential for project documentation because it:

- Enhances Detail: Provides a detailed breakdown of how each part of the system functions, ensuring clarity in system operations.
- Supports Development: Guides developers in implementing specific functionalities and integrating them into the overall system.
- Facilitates Testing and Maintenance: Enables thorough testing of individual processes and easier troubleshooting of potential issues.

This level of detail in the DFD ensures that stakeholders and developers have a comprehensive understanding of how the hotel booking application processes data and functions at a granular level, promoting effective communication and successful project execution.

7. DEVELOPMENT

7.1 Gantt Chart

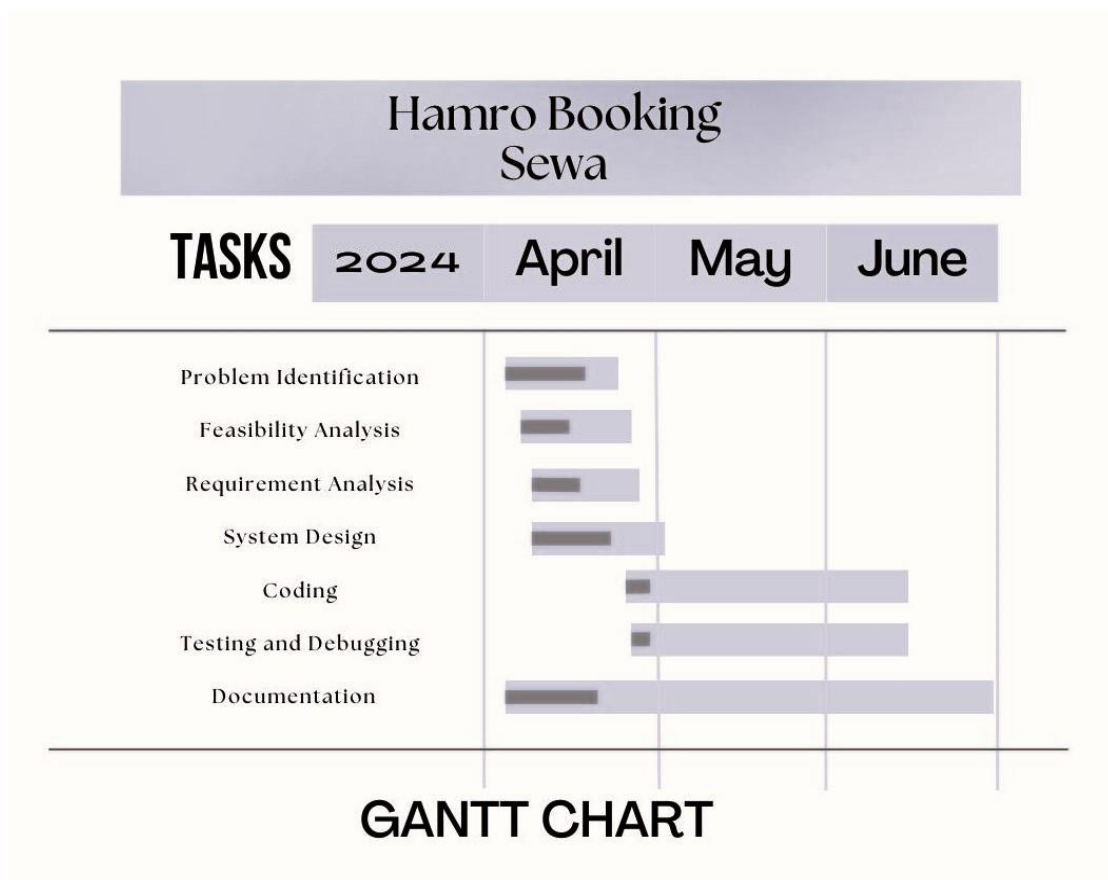


Figure No. 7.1.1: Gantt Chart

1. Problem Identification and Feasibility Analysis

- Identify stakeholders' needs and pain points in current booking systems.
- Conduct feasibility study on technical, economic, and operational aspects.
- Determine project scope, constraints, and risks.

2. Requirement Analysis

- Gather detailed functional and non-functional requirements from stakeholders.
- Prioritize features and functionalities based on user stories and use cases.
- Create requirement specification document

3. System Design

- Design database schema for hotels, rooms, users, bookings, and transactions.
- Architect application structure (frontend and backend) using UML diagrams.
- Define API specifications and integration points with third-party services

4. Frontend Development

- Develop user interfaces for hotel listings, room booking, user registration, and account management.
- Implement responsive design for mobile view.

5. Backend Development

- Implement server-side logic using chosen technology stack
- Develop APIs for user authentication, booking management, and data retrieval.

6. Integration and Testing

- Integrate frontend and backend components to ensure seamless functionality.
- Conduct unit testing for individual modules and components.
- Perform system testing, including usability testing, performance testing, and compatibility testing across browsers and devices.

7. Testing and Debugging

- Identify and resolve bugs, errors, and performance issues through iterative testing.
- Conduct user acceptance testing (UAT) with stakeholders to validate against initial requirements.
- Prepare for deployment by finalizing documentation and training materials.

8. Documentation

- Document all phases of development including requirements, design decisions, and implementation details.
- Create user manuals, admin guides, and API documentation.
- Prepare deployment instructions and system maintenance guidelines.

Dependencies and Constraints:

- Resource Availability: Ensure availability of developers, testers, and designers as per the schedule.
- Technology Integration: Coordinate with third-party APIs and services to meet integration deadlines.
- Scope Management: Manage scope changes through effective communication and change control processes.

7.2 Development Model

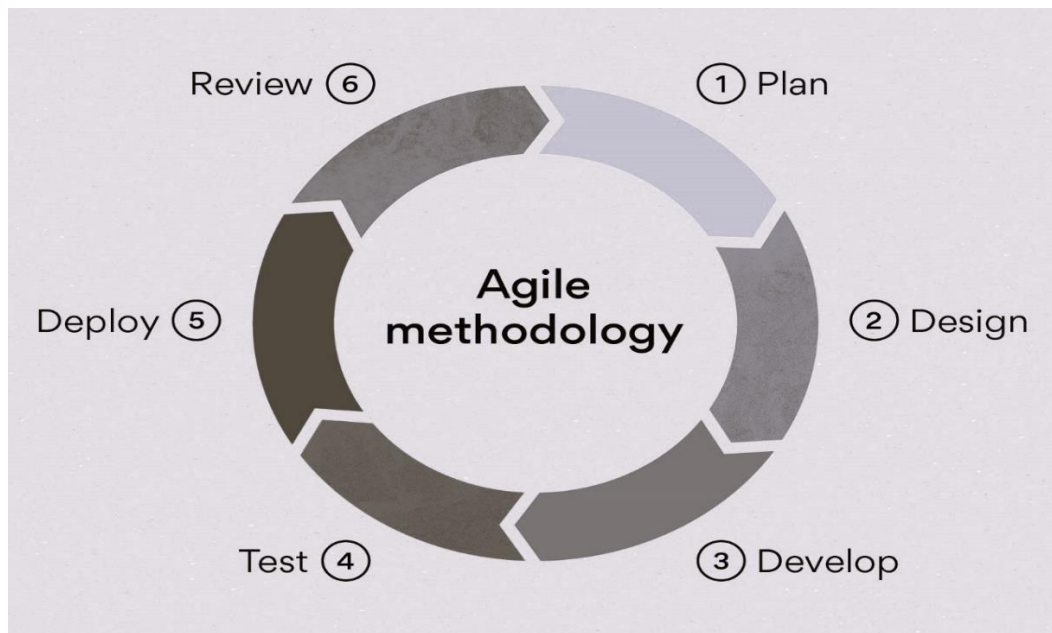


Figure 7.2.1: Agile Model

Agile development is a methodology that focuses on delivering high-quality software in a flexible and iterative manner. It allows for quick adaptation to changes and improvements throughout the development process. This approach is particularly well-suited for developing a hotel booking application, as it enables rapid responses to customer feedback and market demands.

The agile development model for a hotel booking application involves breaking down the development process into small, manageable chunks called sprints. Each sprint typically lasts two to four weeks and results in a functional piece of the application. This allows for continuous testing, feedback, and iteration, ensuring that the final product meets the needs of users and stakeholders.

One of the key principles of agile development is prioritizing customer collaboration and feedback. In the context of a hotel booking application, this means involving hotel managers, staff, and customers in the development process to ensure that the features and functionalities meet their needs. This customer-centric approach helps to create a more user-friendly and efficient application.

Another important aspect of the agile development model is the concept of continuous improvement. Developers are encouraged to regularly review and adjust their work

based on feedback and changes in the market. For a hotel booking application, this involves adding new features, optimizing existing ones, or improving the overall user experience in response to customer feedback and competitive analysis.

Agile development also emphasizes the importance of transparency and communication within the development team. Regular meetings, known as stand-ups, are held to discuss progress, issues, and priorities. This fosters a collaborative environment where team members can share ideas, provide support, and work together towards a common goal.

Scalability is another advantage of the agile development model for a hotel booking application. As the business grows and evolves, new features and functionalities can be easily added to the application in response to changing needs and market demands. This allows the application to remain relevant and competitive in the rapidly changing hospitality industry.

One of the key benefits of using the agile development model for a hotel booking application is the ability to quickly respond to changes and market trends. By breaking down the development process into small, manageable chunks, developers easily adapt to new requirements and incorporate feedback from customers and stakeholders.

Furthermore, the iterative nature of agile development allows for early detection and resolution of issues. Regular testing and feedback help to identify bugs, usability issues, and other problems early on in the development process, reducing the risk of costly rework and delays later on.

Additionally, the agile development model promotes a culture of continuous learning and improvement within the development team. By encouraging regular reflection and feedback, developers can identify areas for improvement and implement changes to enhance their skills and productivity.

The agile development model is well-suited for the development of a hotel booking application due to its flexibility, customer-centric approach, and focus on continuous improvement. By breaking down the development process into small, manageable chunks, involving customers and stakeholders in the process, and fostering transparency and communication within the development team, developers create a high-quality, user-friendly, and competitive product that meets the evolving needs of the hospitality industry.

8. TESTING

STLC is a framework that defines a task performed at each step to make sure that software goals are achieved.

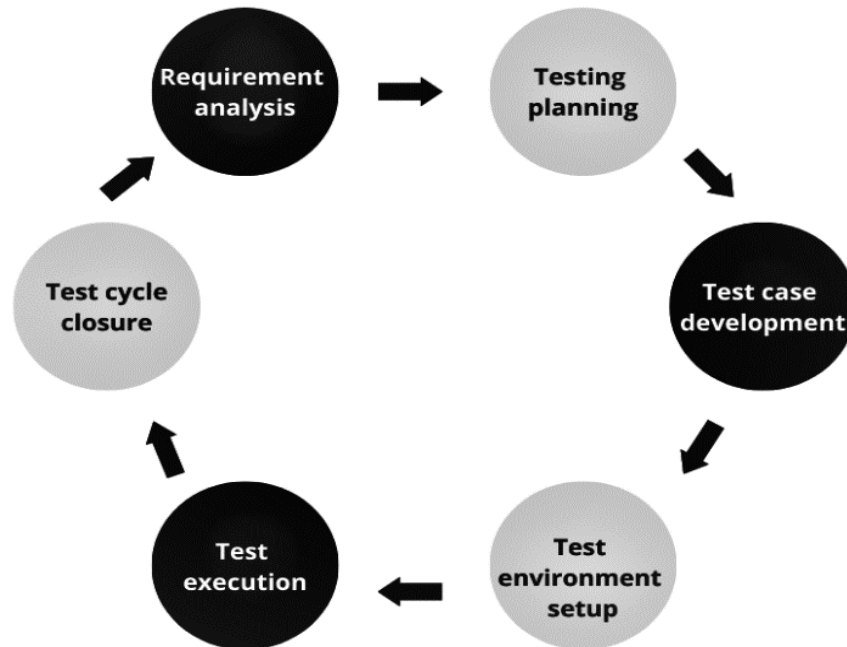


Figure No. 8.1.1: Software Testing Life Cycle

1. Requirement Analysis

- Review user stories and use cases related to booking rooms, managing reservations, and user accounts.
- Define testing objectives and scope based on business requirements.
- Identify risks associated with booking processes and user data security.

2. Test Planning

- Estimate testing efforts for various modules
- Determine test strategy including types of testing
- Create a test plan outlining test objectives, test environment setup, and test case development milestones.

3. Test Case Designing

- Create test cases for booking a room, modifying/cancelling reservations, and handling payment transactions.
- Define test scripts for scenarios like multiple user sessions, and error handling.
- Prepare test data including sample bookings, and user profiles, for different test scenarios.

4. Test Environment Setup

- Acquire or configure hardware and software required for testing
- Install and configure the application under test along with necessary dependencies
- Validate the test environment to ensure compatibility with different devices

5. Test Execution

- Execute test cases to verify room availability, booking confirmation, and processing workflows.
- Record and report test results including pass/fail status, defects found, and test coverage.
- Conduct regression testing to ensure new features or bug fixes do not adversely affect existing functionality.

6. Test Closure:

- Review test coverage metrics against defined test objectives and acceptance criteria.
- Assess software quality based on reliability, performance, usability, and security aspects.
- Prepare test closure reports documenting testing outcomes, lessons learned, and recommendations for future enhancements.

Test Case ID	Test Case	Test Steps	Test Data	Results
TC001	Verify application interface	1.Open application 2. Navigate Login	-	Hotel booking interface loads successfully
TC002	Admin login	1. Open browser 2. Navigate to login page 3. Enter admin credentials 4. Click login button	Admin username, password	Admin is logged in successfully
TC003	Admin logout	1. Logged in as admin 2. Click logout button	-	Admin is logged out successfully
TC004	Admin add hotel	1. Logged in as admin 2. Navigate to hotel management 3. Click 'Add Hotel' 4. Enter hotel details 5. Save changes	Hotel details (name, address, etc.)	Hotel is added successfully
TC005	Admin manage hotel details	1. Logged in as admin 2. Navigate to hotel management 3. Find existing hotel 4. Update hotel details 5. Save changes	Updated hotel details	Hotel details are updated successfully
TC006	Admin add room	1.Logged in as admin 2. Navigate to room management	Room details (type, price, etc.)	Room is added successfully

		3. Click 'Add Room' 4. Enter room details 5. Save changes		
TC007	Admin manage room details	1. Logged in as admin 2. Navigate to room management 3. Find existing room 4. Update room details 5. Save changes	Updated room details	Room details are updated successfully
TC008	User registration	1. Open application 2. Navigate to registration page 3. Enter user details 4. Click 'Sign Up'	User registration details	User is registered successfully
TC009	User login	1. Open application 2. Navigate to login page 3. Enter user credentials 4. Click login button	User username, password	User is logged in successfully
TC010	User search for hotels	1. Logged in as user 2. Enter search criteria (location, names) 3. Click 'Search'	Search criteria	Relevant hotels are displayed
TC011	User view hotel details	1. Logged in as user 2. Select a hotel from search results 3. View hotel details	-	Hotel details (amenities, room types) are displayed correctly

TC012	User book a room	<ol style="list-style-type: none"> 1. Logged in as user 2. Select a hotel and room 3. Enter booking details (dates, guest info) 4. Confirm booking 	Booking details	Booking is confirmed successfully
TC013	User cancel booking	<ol style="list-style-type: none"> 1. Logged in as user 2. Navigate to booking management 3. Find booking to cancel 4. Click 'Cancel Booking' 	-	Booking is canceled successfully
TC014	User view booking history	<ol style="list-style-type: none"> 1. Logged in as user 2. Navigate to booking history 	-	All past bookings are listed correctly
TC015	User logout	<ol style="list-style-type: none"> 1. Logged in as user 2. Click logout button 	-	User is logged out successfully
TC016	Password reset	<ol style="list-style-type: none"> 1. Open application 2. Navigate to password reset page 3. Enter registered email 4. Click 'Reset Password' 	Registered email	Password reset link is sent and functional
TC017	Error handling (invalid login)	<ol style="list-style-type: none"> 1. Open browser 2. Navigate to login page 3. Enter invalid credentials 4. Click login button 	Invalid username, password	Error message indicates invalid login attempt

9. PROJECT RESULT

- Illustrated the real time use and memory space of science project by programming in React Native, a framework of JavaScript for front end and PHP framework Laravel for backend.
- Find hotels based on price range, and amenities, streamlining the booking process.
- Access to a wide range of hotels, from budget to luxury, catering to diverse preferences and budgets.
- Comprehensive details about each hotel, including photos, amenities, and room types empowering users to make informed decisions.
- Access to reliable customer support for assistance with bookings, and queries, ensuring a positive user experience and support throughout the process.
- Determined user's expectations for a modified product considering the easiness of our system in real version monitoring mode
- Distinguished the role of the codes involved while developing a simple android application.
- Evaluated and corrected project modification risks related with its completion and estimating the effects on properties, energy and development.
- Achieved basic and intermediate skills of android application development to nurture our programming with frequently communicated system features
- Generated an extra interface in the booking application using available structures in React Native and Laravel.
- Identified and justified the specific use of the codes in React Native and Laravel in system development

The result of our project is our system is working perfectly fine. The booking theory is accurate. The best part of our system is that its very user friendly. Anyone can use it and find it easy to use. We have documented the design of our system in such a way that anybody can alter it by reading our documentation. Finally, the application is suitable to use by any kind of age group.

10. FUTURE ENHANCEMENT

- Implement different levels of subscriptions, where hotels can get benefits according to their booking rates.
- Implement a "Like and Dislike" feature to enhance user feedback on hotel stay content for better personalization and hotel recommendations.
- Expand language options to cater to a larger audience.
- Implement personalized notifications for new hotels, discount offers, and hotel community events.
- Offer the option to view hotel details for offline viewing, catering to users with limited internet access.

▪ Budget Program

This hotel booking application can be further enhanced by a budget program in future. In budget program every hotel owner will have support to manage and utilize specific amount of money in a better way. With this amount they will manage everything like hotel expenditures and employees' salaries.

▪ Visual Representation of Data

Graphs and charts can be added into future version of hotel booking application. Through these charts or graphs, hotel management can see the change in the salary of an employee and over all increment in rates of hotel rooms. Management can also analyze the tax paid by hotel in different time periods.

11. CONCLUSION

Hotel booking applications are a technology that has completely changed the travel industry as well as booking models among travelers. A lot has changed since that very first online reservation system in the early 1990s. Since then, technology has been constantly improving, making booking and accommodation access easier no matter the location or the type of lodging.

We have seen some effects emerge regarding hotel booking applications. Travel experts fear travelers may be turning 'platform indifferent,' booking accommodations regardless of the size of the hotel or the service quality. Nonetheless, travelers have proven they are willing to seek out unique experiences if the destination and accommodations are worth the price. However, the abundance of accommodation options has made travelers more inclined to book 'solo,' always connected to a device and somewhat isolated from traditional booking methods. Apparently, travelers are willing to sacrifice personal interactions 'offline' in favor of personalized booking experiences.

Our hotel booking application is a platform that enables travelers to book their accommodations with ease. It has an intuitive interface so that users can easily find the perfect place to stay, and hoteliers can also easily manage their listings and connect with travelers.

Hotel booking applications are here to stay. The future of travel planning is just beginning; more and more options will appear for users who want to book accommodations from their own devices. There is no way to predict how far hotel booking technology will advance, but it's clear that convenience and accessibility will continue to drive its evolution. As technology improves, so too will the ways travelers interact with and choose their accommodations.

Despite concerns about the impact of digital booking platforms on traditional travel agencies and face-to-face interactions, the demand for convenient, immediate booking options remains strong. Travelers appreciate the ability to compare prices, read reviews, and make decisions quickly and efficiently from their smartphones or computers. This shift towards digital booking also benefits hoteliers, who can reach a broader audience and manage their properties more efficiently through centralized booking systems.

In conclusion, while some may lament the potential loss of personal touch in travel planning, hotel booking applications offer unparalleled convenience and choice for modern travelers. As the industry continues to innovate, these platforms will play an increasingly important role in shaping how people experience and enjoy their journeys around the world.

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13. ANNEX