HOTEL MANAGEMENT SYSTEM

A MINI PROJECT REPORT

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BONAFIDE CERTIFICATE

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ABSTRACT

The Hotel Management System is a project aimed at improving the efficiency of hotel operations, enabling hotel staff to manage reservations, guest check-ins and check-outs, room management, billing, and reporting. The system is developed using the Python programming language, which is widely used for its flexibility, ease of use, and extensive libraries.The project is designed to be user-friendly and intuitive, with a graphical user interface (GUI) that enables hotel staff to easily navigate and perform various tasks. The system incorporates several modules, including the guest module, room module, reservation module, billing module, and reporting module.The guest module handles all guest-related information, including guest details, preferences, and history. The room module manages room inventory, availability, and maintenance. The reservation module enables hotel staff to create, modify, and cancel guest reservations, and ensures that the guest's preferred room is available.The billing module calculates the total cost of a guest's stay, including room charges, taxes, and any additional services. It generates invoices and receipts for the guest, and ensures that payments are processed securely and efficiently.The reporting module generates various reports related to hotel operations, such as occupancy rates, revenue, and guest satisfaction. These reports provide valuable insights into the hotel's performance and enable hotel staff to make informed decisions.The system also incorporates security features, such as user authentication and authorization, to ensure that only authorized users can access sensitive information. It also includes data backup and recovery mechanisms to ensure that data is not lost in the event of a system failure.The hotel management system project is designed to help hotels improve their operations, enhance the guest experience, and increase revenue. It provides a comprehensive solution for managing various aspects of hotel operations, enabling hotel staff to focus on providing excellent customer service.

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LIST OF ABBREVATIONS

IOT	Internet of Things
WSN	Wireless Sensor Network
RAB	Robust Ada Boost
FWI	Fire Weather Index
MLP	MultiLayer Perceptron
RNN	Recursive type Neural Network
LSTM	Long Short Term Memory
MIS	Management Information System
ANN	Artificial Neural Network

CHAPTER 1

INTRODUCTION

1.1 PROJECT OVERVIEW

A hotel management system is a complex software application that integrates various processes involved in managing a hotel. The purpose of this project is to develop a comprehensive hotel management system that streamlines and automates the various processes involved in managing a hotel, such as reservation management, check-in/check-out, housekeeping, and reporting. The system will be designed with a user-friendly interface that allows hotel staff to manage day-to-day operations more efficiently and effectively. In this overview, we will discuss in detail the various components and features of the hotel management system project.The system architecture is the foundation of the hotel management system project. It involves the hardware and software components, database management system, and system interfaces. The system will be designed as a web-based application, allowing hotel staff to access it from any device with an internet connection. The database management system will be a relational database management system (RDBMS) that will store all data related to hotel operations. The system interfaces will include a front-end interface for hotel staff, a guest interface for online reservations and check-ins/outs, and third-party integrations for payment processing, customer relationship management (CRM), and marketing platforms.The user management component of the hotel management system project will handle user authentication, authorization, and user roles. The system will have three user roles: administrator, front desk staff, and housekeeping staff. Each user will have a unique username and password, and access to certain features of the system will be restricted based on their user role.The reservation management component of the hotel management system project will handle online booking, room availability, and payment

processing. Guests will be able to book rooms online through the guest interface or through the front desk. The system will display real-time room availability, allowing guests to select their preferred room based on availability. Payment processing will be handled through a third-party payment gateway, and guests will be able to make payments online or at the front desk.The check-in/check-out component of the hotel management system project will handle room assignment, key distribution, and payment processing. When a guest checks in, the front desk staff will assign them a room and distribute keys.

The guest's payment will be processed through the payment gateway, and a receipt will be generated. When a guest checks out, the front desk staff will collect the keys and confirm that the guest's payment has been processed.The housekeeping management component of the hotel management system project will handle cleaning schedules, inventory management, and maintenance requests. Housekeeping staff will use the system to view room cleaning schedules, which will be generated based on guest check-out times. They will also use the system to manage inventory, ensuring that there are enough supplies in each room. Maintenance requests will be submitted through the system, and the front desk staff will assign them to the appropriate staff member.The reporting and analytics component of the hotel management system project will generate reports and analytics, providing hotel managers with insights into occupancy rates, revenue, and guest satisfaction metrics. Reports will include occupancy rates by room type, revenue by room type, and guest satisfaction metrics such as check-in experience, room cleanliness, and staff friendliness. Analytics will help hotel managers identify trends and make informed decisions about pricing, marketing, and staff training.The integration with third-party systems component of the hotel management system project will handle integration with payment gateways, CRM systems, and marketing platforms. Payment processing will be handled through a third-party payment gateway, allowing guests

to make payments securely and easily. The system will also integrate with a CRM system, allowing hotel staff to manage guest information and preferences. The system will also integrate with marketing platforms, allowing hotels to reach out to past guests with promotions.

1.2 AIM

To develop a software system that helps hotel staff for managing reservations, check-ins, room assignments, and other administrative tasks efficiently. The system could also include features for tracking guest preferences, room inventory, billing, and generating reports for business analysis.

1.3 PROBLEM DEFINITION

The hotel management system project aims to create a software application that can automate and streamline various activities involved in managing a hotel.That involves several complex tasks such as managing room bookings, guest information, staff management, payment processing, reporting, and customer relationship management. The proposed system aims to provide an all-in-one solution that can enhance the overall experience of guests, improve operational efficiency, and increase revenue.One of the most important features of the hotel management system is room management. The software should be able to manage the availability of rooms, types of rooms, and rates for each room. It should enable hotel staff to easily check room availability, and allow guests to book rooms online, by phone, or in-person. It should also provide an easy-to-use interface for managing room inventory, allowing staff to add, delete or modify room details with ease.

1.4 OBJECTIVE

The hotel management system project involves developing a software application that automates and streamlines various tasks involved in managing a hotel, such as room management, booking management, staff management, payment processing, reporting, and customer relationship management. The system aims to enhance operational efficiency, improve customer satisfaction, increase revenue and profitability, and ensure data security and privacy.

CHAPTER 2

SYSTEM ANALYSIS

System analysis is a problem solving technique that decomposes a system into its component pieces for the purpose of studying how well those component parts work and interact to accomplish their purposes. System analysis is the process of studying a procedure or business in order to identify its goals and purposes and create systems and procedures that will achieve them in an efficient way. Analysis and synthesis, as a scientific method, always go hand in hand; they complement one another. Every synthesis is built upon the results of a preceding analysis, and every analysis requires a subsequent synthesis in order to verify and correct its results.

2.1 EXISTING SYSTEM

Hotel Management System is a software system that is designed to manage various activities such as room bookings, customer management, billing, and other administrative tasks in a hotel. Python, being a versatile programming language, is used for developing hotel management systems due to its flexibility and ease of use. There are various hotel management systems available in the market.Tkinter is a standard Python GUI toolkit used for developing desktop applications. The Hotel Management System using Tkinter is a desktop application that can be used to manage hotel bookings, room availability, customer management, and billing. It has a simple and easy-to-use interface that can be accessed from a desktop computer.

2.2 TKINTER-BASED APPROACH

Tkinter is a popular Python GUI toolkit that allows developers to create user-friendly graphical interfaces for desktop applications. It is well-suited for developing hotel management systems due to its simplicity and ease of use. Tkinter offers a range of widgets, including buttons, labels, text boxes, and menus, which can be customized to meet specific requirements. Additionally, it provides tools for handling events such as button clicks and keystrokes, making it easy to implement interactivity and responsiveness.

In a tkinter-based hotel management system, the GUI is the key component. The GUI design should be intuitive and easy to navigate, with a clean layout that allows users to quickly access the different functionalities of the system. The system should allow users to manage guests, reservations, room availability, billing, and other related tasks. It should also incorporate a database to store and retrieve information about guests, rooms, and reservations. User authentication should also be implemented to secure the system and ensure that only authorized users can access it.

Using Tkinter for hotel management system development offers several advantages, including easy customization, interactivity, and responsiveness. Developers can create a user-friendly interface that meets the specific requirements of the hotel, providing a seamless experience for both staff and guests. Additionally, Tkinter is a free and open-source toolkit, making it accessible to developers with varying levels of experience and budgets.

Integration with other tools: A hotel management system should be able to integrate with other tools such as POS (point of sale) systems, accounting software, and other third-party applications. When developing a Tkinter-based hotel management system, it is essential to ensure that it can seamlessly integrate with other tools that

the hotel uses.

Accessibility: The hotel management system should be accessible to users with disabilities, including those who are visually or hearing impaired. Tkinter provides tools for creating accessible user interfaces, such as support for screen readers and high-contrast color schemes.

Customization: A hotel management system should be customizable to meet the unique needs of the hotel. Tkinter allows developers to create custom widgets, themes, and styles, which can be used to create a unique look and feel for the hotel management system.

Security: Security is crucial when developing a hotel management system. The system should be secure to protect guest data and prevent unauthorized access. Tkinter provides tools for implementing security features such as user authentication, encryption, and secure communication protocols.

Scalability: A hotel management system should be scalable to accommodate future growth and changes. Tkinter-based systems can be easily scaled up to handle more guests, rooms, and staff as the hotel grows.

Support and Documentation: Tkinter is a well-documented toolkit with an active community of developers who provide support and guidance. When developing a hotel management system using Tkinter, it is essential to leverage the available resources, such as documentation, forums, and online communities, to ensure that the system is developed to best practices and standards.

Developing a hotel management system using Tkinter requires careful

planning, attention to detail, and a thorough understanding of the hotel's requirements. However, with the right approach, Tkinter provides a powerful and flexible toolkit for creating a robust and reliable hotel management system that meets the needs of the hotel and its guests.

Tkinter is a powerful Python library for creating graphical user interfaces (GUIs). With Tkinter, developers can create user-friendly interfaces for a variety of applications, including hotel management systems. In this project, we will demonstrate how to build a hotel management system using Tkinter.To start, we will create a main window for our application using the Tkinter Tk class. This will serve as the main window of our application and will contain all the other widgets we need. We can customize the look and feel of this window using the various options available in the Tk class.Next, we will add widgets to our main window. We will start by adding a menu bar using the Menu class. The menu bar will contain options for creating and managing hotel rooms, adding and editing guest information, and generating reports.We will also add a series of frames to our main window to organize our widgets. We will create a frame for each major section of the application, such as room management, guest management, and report generation.

Within each frame, we will add widgets such as labels, text boxes, buttons, and drop-down menus.For the room management section, we will create a form for adding and editing room information. This form will include fields for room number, room type, price, and availability. We will also add buttons for adding new rooms, editing existing rooms, and deleting rooms.In the guest management section, we will create a similar form for adding and editing guest information. This form will include fields for guest name, address, phone number, and room number. We will also add buttons for adding new guests, editing existing guests, and deleting guests.

To generate reports, we will add a third section to our application that will contain various report generation options. We will include options for generating

occupancy reports, revenue reports, and guest lists. Each report will be displayed in a separate window when the user selects the corresponding option from the menu. Finally, we will add functionality to our application using Python code. We will use functions to handle user input, update data structures, and generate reports. We will also use the Tkinter messagebox class to display error messages and confirmations to the user. Overall, our hotel management system will provide a user-friendly interface for managing hotel rooms and guests, generating reports, and keeping track of revenue. With the power of Tkinter and Python, we can create a robust and flexible application that can be customized to meet the needs of any hotel or hospitality business.

2.3 FEASIBILITY STUDY:

Feasibility study is a process of assessing the viability of a project from various perspectives such as technical, economic, legal, operational, and cultural. In the case of a hotel management system project using Python, a feasibility study should be conducted to determine whether the project is worth pursuing and what resources are required to complete the project successfully. Here are some of the feasibility aspects of a hotel management system Python project:

1. TECHNICAL FEASIBILITY
2. ECONOMIC FEASIBILITY
3. LEGAL FEASIBILITY
4. OPERATIONAL FEASIBILITY
5. CULTURAL FEASIBILITY

2.3.1 TECHNICAL FEASIBILITY:

Technical feasibility assesses whether the proposed hotel management system can be developed using Python and related technologies. Python is a versatile programming language that can be used for developing a wide range of applications, including hotel management systems. Other technologies such as Django, Flask, PyQt, and OpenCV are also available to develop different types of hotel management systems. Therefore, the technical feasibility of the project is high, and the choice of technology should be based on the specific needs and requirements of the hotel.

2.3.2 ECONOMIC FEASIBILITY:

Economic feasibility assesses whether the proposed hotel management system project is financially viable. The costs involved in developing the system, including hardware, software, personnel, and other expenses, should be estimated, and the benefits of the system, such as increased efficiency, reduced costs, and improved customer satisfaction, should be evaluated. If the benefits outweigh the costs, the project is economically feasible.

2.3.3 LEGAL FEASIBILITY:

Legal feasibility assesses whether the proposed hotel management system project complies with legal and regulatory requirements. For example, the system should comply with data protection laws, privacy laws, and other regulations that govern the handling of customer data. The legal feasibility of the project should be assessed, and any legal issues should be addressed before starting the project.

2.3.4 OPERATIONAL FEASIBILITY:

Operational feasibility assesses whether the proposed hotel management system project can be implemented and integrated with the existing systems and processes of the hotel. The system should be designed to streamline the hotel's operations and improve the efficiency of various processes such as room bookings, customer management, billing, and other administrative tasks. The operational feasibility of the project should be assessed, and any operational issues should be addressed before starting the project.

2.3.5 CULTURAL FEASIBILITY:

Cultural feasibility assesses whether the proposed hotel management system project aligns with the culture of the hotel and its stakeholders. The system should be designed to meet the needs and expectations of the hotel's customers, employees, and other stakeholders. The cultural feasibility of the project should be assessed, and any cultural issues should be addressed before starting the project.

CHAPTER 3

SYSTEM DESIGN AND DEVELOPMENT

3.1 SYSTEM OVERVIEW

A hotel management system project using Python is a software application that is designed to streamline and automate various aspects of hotel operations. The system provides a centralized platform that can be used by hotel staff to manage guest reservations, room assignments, billing, inventory, and other hotel-related tasks. The following is an overview of the major features and functionalities of a hotel management system Python project:

1.Reservation Management:

The reservation management system is a key component of a hotel management system project. It allows guests to make room reservations online, over the phone, or in person. The system keeps track of the availability of rooms, room types, and room rates. When a guest makes a reservation, the system updates the inventory of available rooms and assigns a room based on the guest's preferences.

2.Billing Management:

The billing management system is another important component of a hotel management system project. It allows hotel staff to generate invoices and track payments made by guests. The system provides automated billing processes that reduce the workload for hotel staff, including features such as automatic calculations of room rates, taxes, and other charges.

3.Guest Management:

The guest management system is another important component of the hotel management system project. It allows hotel staff to manage guest information, including contact details, preferences, and past booking history. The system enables hotel staff to provide personalized service to guests by anticipating their needs based on their past booking history.

4.Security and Access Control:

The security and access control system is an important component of the hotel management system project. It ensures that the system is secure and that only authorized personnel can access sensitive information. The system includes features such as password protection, access control, and data encryption.

5.User Interface:

The user interface is the component of the hotel management system project that provides the graphical user interface (GUI) for the system. It allows hotel staff to interact with the system and perform various tasks such as making room reservations, updating guest information, and generating invoices.

Overall, a hotel management system Python project provides an efficient and comprehensive solution for managing various aspects of hotel operations. By automating tasks such as reservation management, billing management, inventory management, and guest management.
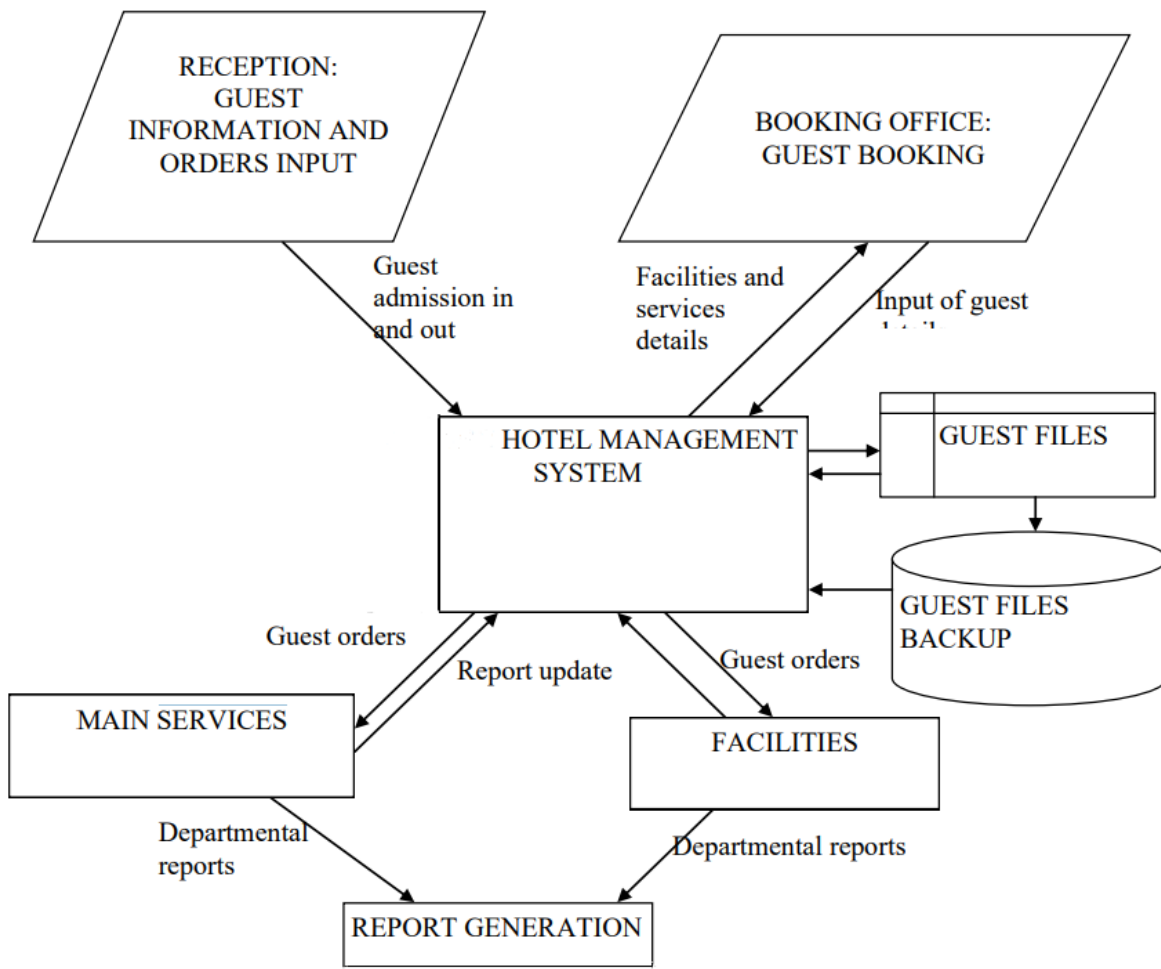
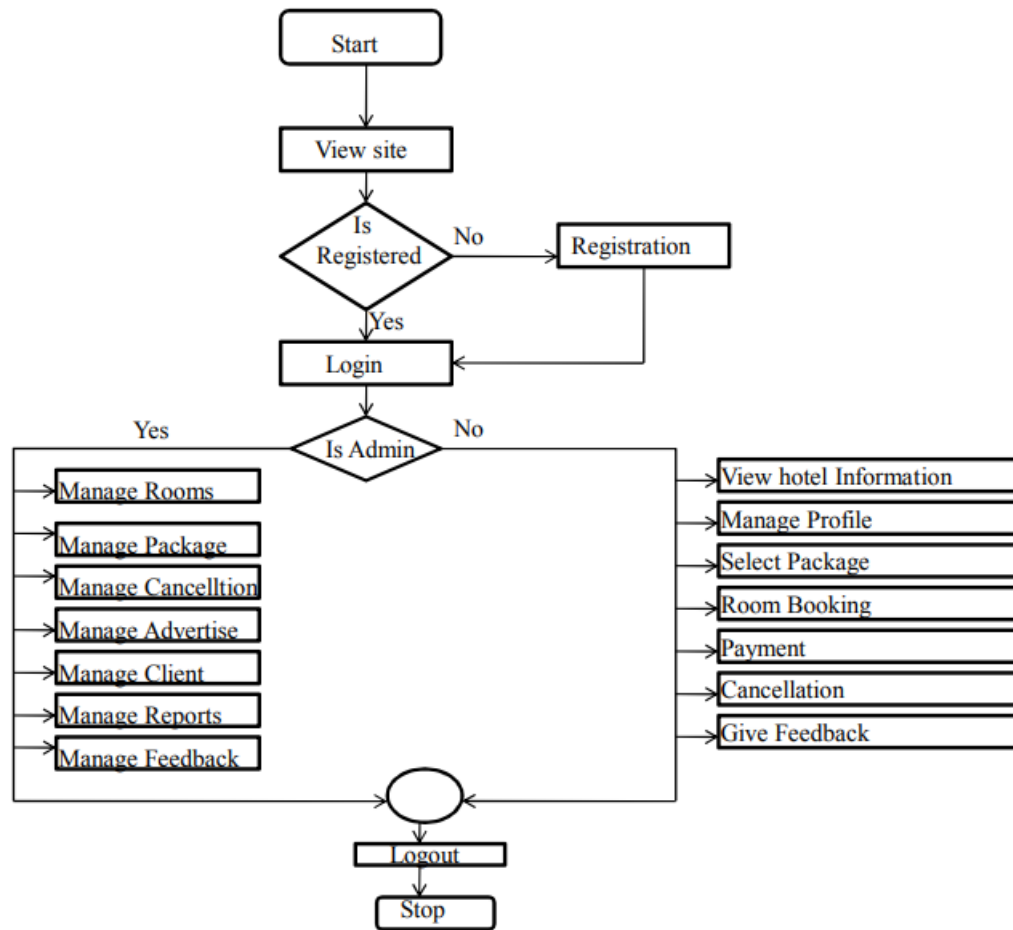**Figure 3.1 Block Diagram of Hotel Management System**

Figure 3.2 Flow Diagram of Hotel Management System

Figure 3.3 ER Diagram of Hotel Management System

3.2 SYSTEM ARCHITECTURE

The User Interface (UI) is the front-end of the hotel management system that enables the user to interact with the system. The UI is designed to be user-friendly and intuitive, enabling the hotel staff to perform tasks such as managing reservations, updating guest information, and generating invoices.The application logic layer is responsible for handling the business logic of the hotel management system. It includes various modules that enable the system to handle tasks such as reservation management, billing management, inventory management, and guest management. The application logic layer uses various algorithms and rules to automate tasks and reduce the workload of hotel staff.The database management system (DBMS) is responsible for managing the hotel's database. The database contains various information such as guest reservations, room availability, pricing, and other hotel-related data. The DBMS provides features such as data storage, retrieval, and indexing.The reservation management system (RMS) is responsible for managing the reservation process. The RMS enables guests to book rooms and ensures that the hotel has the necessary inventory available for each reservation. The RMS includes features such as room availability checks, booking confirmations, and room assignment.The billing management system (BMS) is responsible for managing the billing process. The BMS generates invoices and keeps track of payments made by guests. The BMS also generates reports on hotel revenue, occupancy rates, and other financial information.The inventory management system (IMS) is responsible for managing the hotel's inventory. The IMS tracks inventory levels, generates purchase orders, and manages stock control. The IMS includes various modules for managing different types of inventory such as room supplies, food, and beverages.The reporting and analytics system (RAS) is responsible for generating reports and analytics on hotel operations. The RAS provides reports on

occupancy rates, revenue, and guest demographics. The RAS enables hotel management to analyze trends and make informed decisions about pricing, marketing, and other strategies.The security and access control system (SACS) is responsible for ensuring that the hotel management system is secure and that only authorized personnel can access sensitive information. The SACS includes features such as password protection, access control, and data encryption.The hotel management system architecture is designed to be modular and scalable. The modular architecture enables the system to be easily extended and customized. The scalability of the architecture enables the system to handle a large number of users and data.The hotel management system uses Python as the programming language. Python is an interpreted language that provides a wide range of libraries and frameworks for developing web applications. The system is designed to be platform-independent and can be deployed on various operating systems such as Windows, Linux, and macOS.The system uses various libraries and frameworks such as Django, Flask, and SQLAlchemy. Django is a high-level Python web framework that provides a rich set of features for developing web applications. Flask is a micro web framework that provides a simple and flexible approach to developing web applications. SQLAlchemy is a Python library that provides a high-level interface for working with relational databases.The system architecture is designed to be cloud-native and can be deployed on various cloud platforms such as Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform (GCP). The cloud-native architecture enables the system to be easily scalable and provides high availability and fault tolerance. the system architecture of a hotel management system using Python is designed to be modular, scalable, and cloud-native. The system architecture includes various components such as the user interface, application logic, database management system, reservation management.
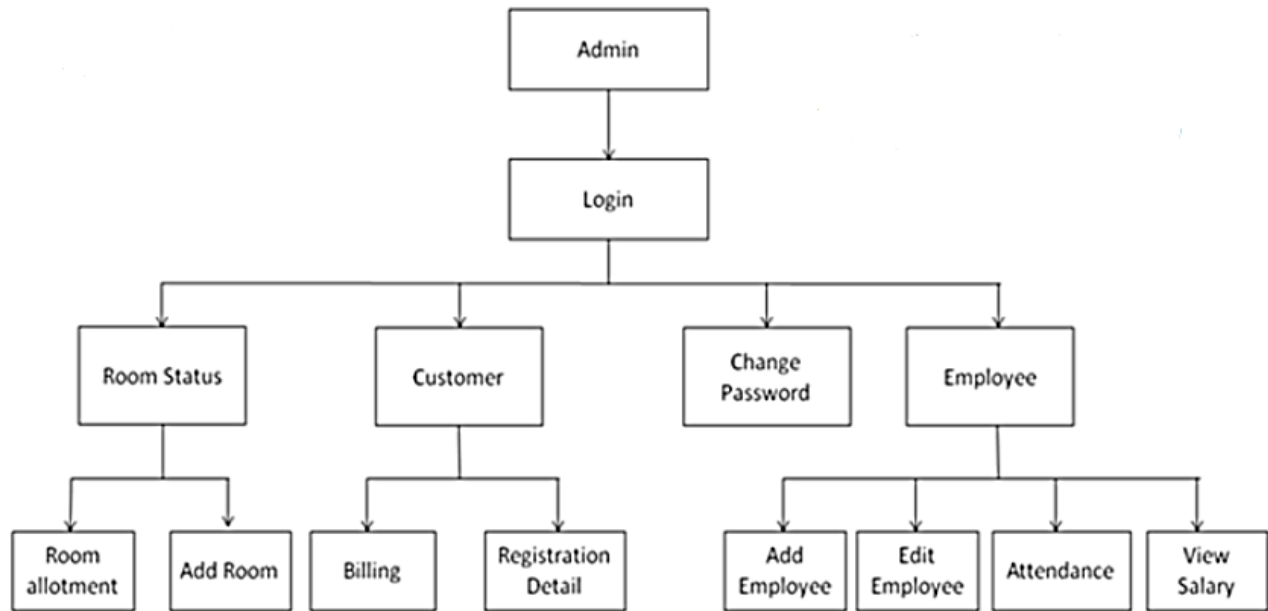
Figure 3.4: Architecture for Hotel Management System

The system architecture of a hotel management system using Python is designed to be modular, scalable, and cloud-native. The system architecture includes various components such as the user interface, application logic, database management system, reservation management.

CHAPTER 4

SYSTEM IMPLEMENTATION AND TESTING

The implementation and testing of a hotel management system using Python involves several steps. Firstly, the development environment needs to be set up, which includes installing Python, the database management system, and any required libraries or frameworks. Next, the database schema needs to be designed, optimized for performance and scalability. Application development follows, where each module of the system is implemented according to best practices, such as modular design and error handling. The user interface is then developed, designed to be intuitive and user-friendly, including forms, tables, and charts. Integration and deployment involve bringing all the components together, ready for use on a production environment. Testing the system requires unit testing for each module, integration testing for the components, user acceptance testing for the end-users, performance testing for different load conditions, security testing against possible threats, and usability testing to ensure that the system is user-friendly. All scenarios and edge cases need to be tested to ensure that the system is reliable, secure, and usable for the end-users. Overall, the implementation and testing of a hotel management system require careful planning and attention to detail to ensure a successful and efficient system.

The implementation of a hotel management system using Python involves the following steps:

1.Setup Development Environment:

The first step in implementing the system is to set up the development environment. This involves installing Python, database management system, and required libraries and frameworks such as Django, Flask, and SQLAlchemy.

2.Database Design:

The next step is to design the database schema for the hotel management system. The database schema should include all the necessary tables, relationships, and constraints. The database schema should be optimized for performance and scalability.

3.Application Development:

The application development involves implementing the various modules of the hotel management system such as reservation management, billing management, inventory management, and guest management. The application development should follow best practices such as modular design, code optimization, and error handling.

4.User Interface Development:

The user interface development involves designing and implementing the user interface of the hotel management system. The user interface should be intuitive and user-friendly. The user interface should provide features such as forms, tables, and charts.

5.Integration and Deployment:

The integration and deployment involve integrating the various components of the hotel management system such as the user interface, application logic, and database management system. The system should be deployed on a production environment such as a cloud platform or a dedicated server.

System Testing:

The testing of a hotel management system using Python involves the following steps:

1.Unit Testing:

The unit testing involves testing each module of the hotel management system in isolation. The unit testing should cover all the possible scenarios and edge cases.

2.Integration Testing:

The integration testing involves testing the integration of various components of the hotel management system such as the user interface, application logic, and database management system. The integration testing should cover all the possible scenarios and edge cases.

3.User Acceptance Testing:

The user acceptance testing involves testing the hotel management system with the actual end-users such as hotel staff and guests. The user acceptance testing should cover all the possible scenarios and edge cases.

4.Performance Testing:

The performance testing involves testing the performance of the hotel management system under different loads and stress conditions. The performance testing should cover all the possible scenarios and edge cases.

5.Security Testing:

The security testing involves testing the security of the hotel management system against various threats such as SQL injection, cross-site scripting, and brute force attacks. The security testing should cover all the possible scenarios and edge cases.

6.Usability Testing:

The usability testing involves testing the usability of the hotel management system with the actual end-users such as hotel staff and guests. The usability testing should cover all the possible scenarios and edge cases.

CHAPTER 5

USER MANUAL

This phase outlines what the user needs to maximize the potential of the system and how to use the system.

Instillation requirements:

- Operating system- Windows XP or Vista
- Microsoft office 2007 or 3003 package
- GHz processor
- 512 MB RAM
- 80 GB hard disk
- DVD/ CD drive
- Antivirus

Loading procedure:

The computer technician should use the following procedure to load the system unto the hotel's computers:

- Copy The hotel management system directory unto the hard disk drive from the CD.
- Double click on the directory to open the folder.
- In the folder, double click on the hotel access project icon to open the system.
- Click YES in the dialog box that appears to display the system's objects.
- Select the forms object.
- Double click the Hotel main switch board.
- From the main switch board the user can access the other forms.

CHAPTER 6
PREVIEW

1.HOME PAGE:

2.CHECK IN PAGE:

3.RECEIPT FOR GUEST:


```
 recipt

                    ---------Verve Hostels And Stays--------------
                    ----------Varkala,Kerala----------------
                    ---------Customer Records----------------
                    _____
                    NAME-Mr.XyZ
                    ADDRESS-123,alpha street,Newyork
                    MOBILE NO.-
                    YOUR TOTAL BILL IS Rs.-4000
                    YOUR ROOM NUMBER IS 1
```

4.DISPLAY LIST OF ALL GUESTS:

HOTEL MANAGEMENT   – □ ×

LIST OF ALL GUEST

NAMES	ROOM NO.
MR.XYZ	1

5.CHECK OUT:

6.TO DISPLAY INFO OF GUESTS:

CHAPTER 7

CONCLUSION AND FUTUREWORK

7.1 CONCLUSION

The hotel management system developed using Python is an effective solution for managing hotel operations. The system provides hotel staff with a comprehensive platform to manage reservations, billing, inventory, and guest information. The system is designed to be intuitive and user-friendly, making it easy for staff to navigate and use. The user interface is visually appealing and includes interactive features such as forms, tables, and charts to improve the user experience. the hotel management system developed using Python is an effective and efficient solution for managing hotel operations. The system provides hotel staff with a comprehensive platform to manage reservations, billing, inventory, and guest information. The system is reliable, secure, and user-friendly, making it easy for staff to use and providing guests with an excellent experience. The system has several benefits, including improved efficiency, reduced errors, increased productivity, and improved customer satisfaction. As such, the hotel management system developed using Python is a valuable investment for any hotel looking to streamline its operations and improve its overall performance.

7.2 FUTURE WORK

One possible area for improvement is the system's scalability. While the system is designed to handle large volumes of data and users, there may be opportunities to further optimize the database schema or application architecture to increase its scalability even further. This could involve exploring new database technologies or implementing sharding techniques to distribute data across multiple

servers. Another area for future work is the implementation of machine learning and artificial intelligence algorithms. These technologies could be used to analyze data from the system and provide insights into guest behavior, inventory levels, and pricing strategies. This could help hotel staff make more informed decisions and improve the overall efficiency and profitability of the hotel. In summary, the hotel management system developed using Python has several areas for future work and improvements. These include improving the system's scalability, integrating with external services, developing a mobile application, implementing machine learning and artificial intelligence algorithms, and adding additional modules or features. Addressing these areas for future work could further enhance the system's functionality, improve hotel operations, and provide guests with an even better experience.

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