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Automation of Hotel Management System

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Abstract: ***The hotel receptionist, manager, administrator can manage all hotel operations online using the Desktop based application known as hotel management system. It is very time-consuming for the receptionist and administrator to manually write down all information and actions manually on paper. In today's fast-paced hospitality industry, managing hotel operations manually often leads to inefficiencies, errors, and poor customer service. The aim of an automated hotel reservation management system is to handle all aspects of the hotel's information and booking system. The system is scalable, allowing small to large hotels to customize it according to their specific needs.***
Keywords: Automation, Hotel Management System, Web Application

I. INTRODUCTION

To compete with the international e-marketplace, a great deal of attention should pay towards the optimization of user requirements to generate recommended hotel alternatives. The smooth operation of hotels is facilitated by a software program known as the 'Hotel Management System. This comprehensive software system computerizes the entire hotel operation.

The objective of this project, Automated Hotel Management System, is to develop a comprehensive solution that digitizes and automates the daily operations of a hotel. The system is designed to simplify the tasks of hotel receptionists, administrators, and management personnel through a user-friendly graphical interface developed using Java Swing and AWT frameworks, coupled with a robust backend powered by MySQL. By introducing automation, the project aims to minimize manual errors, enhance operational efficiency, and significantly improve the overall guest experience. Upon launching the application, users are greeted with a visually engaging splash screen, offering a professional introduction to the system. Following the splash screen, a secure login interface is presented, differentiating between Receptionist and Admin user roles. Each role has its own dedicated credentials and set of functionalities tailored to specific operational needs. Admins are granted access to modules that allow them to add employees, register drivers, and add rooms to the system database. Receptionists, on the other hand, manage customer-related activities such as handling new customer registrations, viewing room availability, accessing employee and manager information, updating check-in and check-out details, room status updates, booking pickups for customers, searching rooms, and performing logout operations.

This system designed using java swing, MySQL and various other features of java which gives it a smooth functioning and working. The system leverages Java's event-driven programming model, using Action Listeners to respond to user interactions within the graphical user interface. Each button and menu item is linked to backend functionality that communicates with the MySQL database, ensuring real-time data manipulation and retrieval. This structure ensures that any update performed by an admin or receptionist is immediately reflected in the system, maintaining data consistency and operational transparency

II. LITERATURE REVIEW

The hospitality industry has seen a significant changes in past few decades and used many new technology methods for it growth which give it a edge over the traditional hotel management practices which heavily relied on manual processes involving paper-based record-keeping and manual coordination of services. However, with the growth of technology in this industry there has been a visible shift towards automated hotel management systems which helps to reduce errors, save time, streamline operations, enhance customer satisfaction. This project centres around the development and implementation of an efficient computerized hotel administration system. The system is designed to provide centralized and well-organized data management and transaction handling. Additionally, it offers a user-friendly interface that ensures easy interaction, even for individuals with limited computer proficiency (Yang, 2013) [1]. A common theme across several studies is the identification of challenges associated with manual hotel management systems. Manual processes are prone to human error, resulting in problems such as double booking of rooms, mismanagement of customer information, misplaced billing records, and inefficient employee scheduling. According to [P. Singh et al., 2021], human errors account for nearly 40% of operational mistakes in small to medium-sized hotels, leading to customer dissatisfaction and revenue losses [2]. Additionally, manual systems often lack real-time data accessibility, making it difficult for hotel staff to provide timely services, especially during peak seasons.

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In the work by [S. Gupta et al., 2017], a hotel management system using Java and flat-file databases was proposed. Although it provided basic functionalities like customer check-in, room allocation, and billing, it lacked robust database management capabilities, leading to data redundancy and inconsistency **[3]**. The absence of a relational database like MySQL made it unsuitable for handling larger volumes of hotel data efficiently. Another system reviewed by [M. Patel and V. Joshi, 2018] focused on a simple PHP-based hotel reservation system. While the system allowed for online booking, it required constant internet access and did not provide any offline mode **[4]**. This presented significant challenges for hotels located in remote areas where internet stability is a concern. Furthermore, security mechanisms were minimal, with no role-based authentication between administrators and receptionists, posing potential risks of unauthorized access. In the study conducted by Abhinav Kumar and Sanjay Tiwari (2017), a desktop-based hotel management system using Java and Oracle Database was developed **[5]**. While it provided core functionalities such as customer registration and billing, the system was largely monolithic, making it difficult to extend with new features like employee or driver management. In a broader study by D.D. Desai et al. (2016), "Smart Hotel Management Systems" were discussed, highlighting the future direction towards IoT and cloud-based systems **[6]**. Although highly advanced, such systems were financially and technically unsuitable for smaller hotels lacking IT infrastructure and consistent network availability.

III. METHODOLOGY

The Automated Hotel Management System was developed using Java Swing, AWT, and MySQL as backend storage. The project aims to provide a unified platform where hotel administrative tasks, customer management, employee records, room bookings, and driver allocations can be handled smoothly. The development process followed a systematic approach, ensuring modularity and scalability. Below is a detailed methodology explaining how the system was built and the flow of its functionalities.

A. System Setup

The development environment was initialized by creating the main class Hotel Management System, extending JFrame and implementing ActionListener. Java Swing components were selected for building the user interface due to their lightweight, flexible, and platform-independent nature. MySQL was chosen as the database management system, providing efficient data storage and retrieval capabilities.

B. Database Design

A MySQL database named hotelMs was created. Tables for storing information related to employees, rooms, customers, managers, and drivers were set up. JDBC (Java Database Connectivity) was used to connect the Java application to the MySQL database, allowing for seamless interaction between the frontend and backend.

C. Frontend development

Developed the frontend using java swing components. A splash screen was initially displayed upon launching the application, followed by a login window.

D. Functional Modules

Receptionist Module

- New Customer Form: Capture and store customer details.
- Room Details: Display room availability and status.
- Employee Info: View employee details.
- Customer Info: View customer check-in and check-out records.
- Manager Info: View management staff information.
- Checkout: Manage customer check-out and update room availability.
- Update Check-in Status: Update customer payment status.
- Update Room Status: Update room cleaning and availability status.
- Pick-up Service: Arrange transport services.

Administrator Module:

- Add Employee: Add new employee records.
- Add Driver: Add new driver details.
- Add Room: Add new rooms to the system.
- Logout Option**:** Secure logout functionality.

Each action button on the GUI was associated with an event listener that directed the user to the corresponding functionality.

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IV. RESULTS AND DISCUSSION

Figure 1: Splash Screen
"The splash screen of the Automated Hotel Management System provides an engaging introduction as the application loads."

Figure 2: Login Page
"The login interface authenticates users by verifying their credentials".

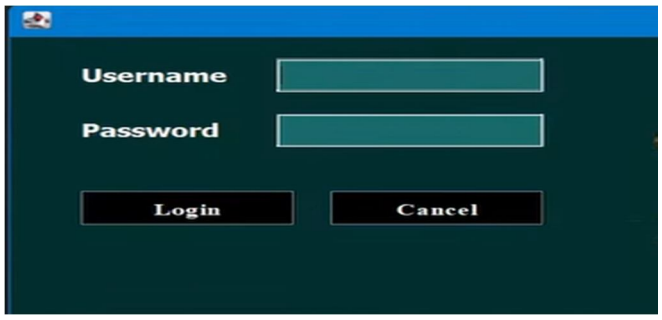

Figure 3: Main Menu – Reception and Admin Selection
"After successful login, users can navigate to either Receptionist or Administrator functionalities from the main menu."

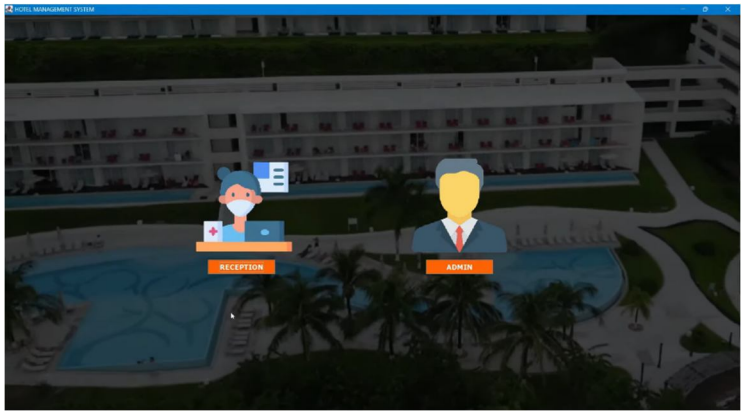

Figure 4: Admin Dashboard Options
"The Administrator dashboard provides functionalities such as adding employees, managing rooms, adding drivers, and viewing administrative data."

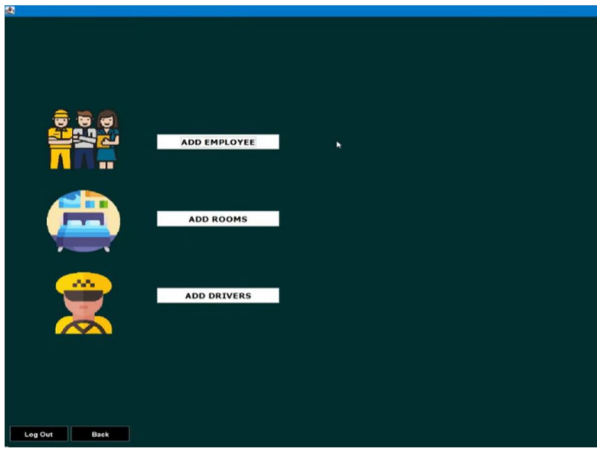

Figure 5: Receptionist Dashboard Options
"The Receptionist dashboard allows operations including customer check-in, room management, employee information access, customer check-out, and other hotel services."

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V. FUTURE SCOPE

The future of hotel management systems is centred around mobile and cloud-based solutions, integration with emerging technologies, elevating guest experiences, advanced analytics and reporting, seamless integration with external platforms and services, and incorporating sustainability and energy management features. These innovations are geared towards enhancing operational efficiency, guest satisfaction, and maintaining competitiveness in the dynamic hospitality industry.

VI. CONCLUSION

In conclusion, the Hotel Management System project serves as a valuable tool for hotel administrators and receptionists to optimize productivity, enhance customer experiences, and streamline operations. The system achieves this by automating various tasks, including the management of employee and customer information, room details, billing processes, and reporting, thereby reducing errors and improving efficiency. management, efficient room allocation, billing and payment processing, complaint tracking, and analytics

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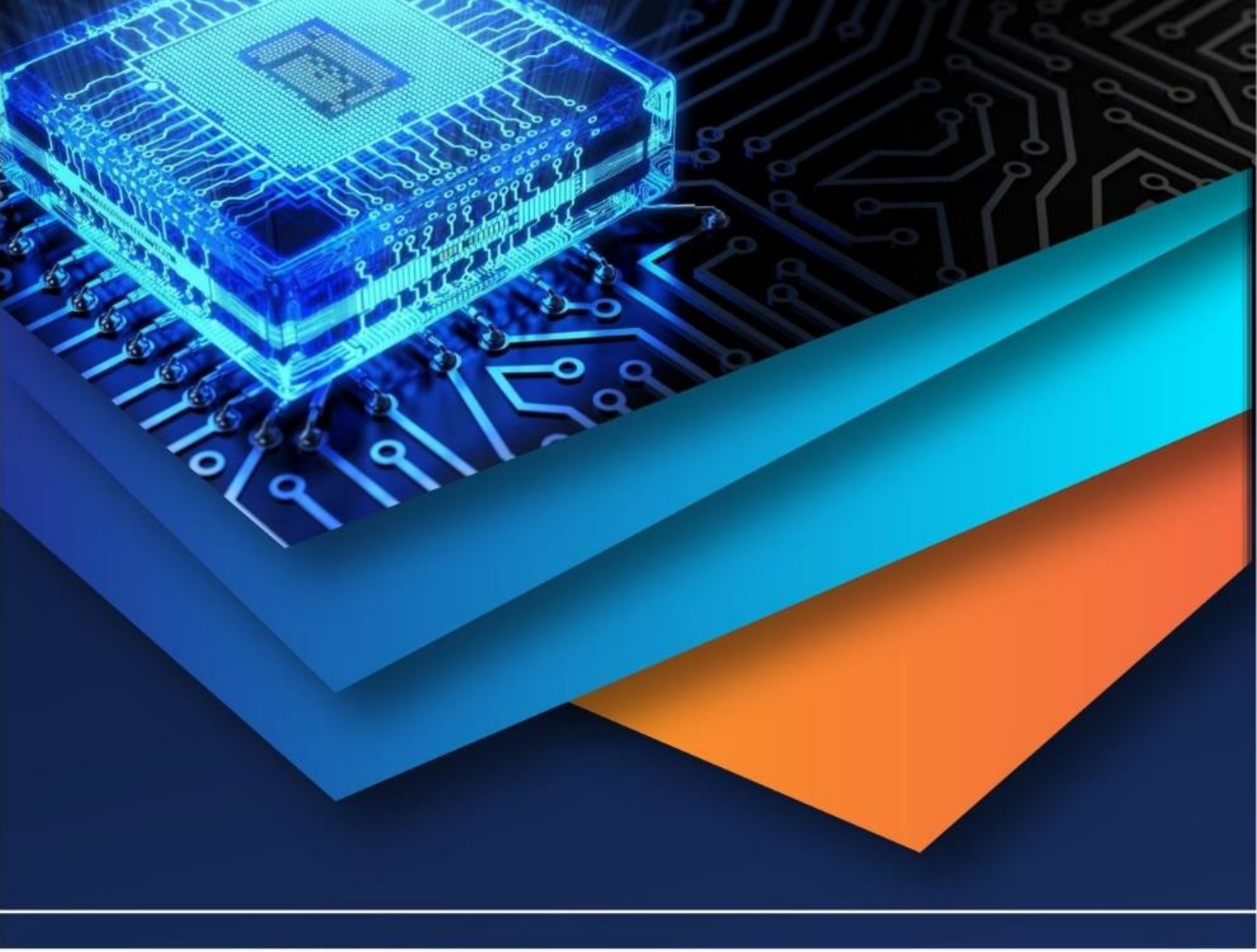

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