A System for Hotel Management: “Your Gateway to Effortless Management "

A MINI PROJECT REPORT

Submitted by

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ACKNOWLEDGEMENT

We now have the opportunity to finish this assignment from the second semester. The only page where we have the chance to convey our feelings and thanks is this one. It gives me great pleasure to offer my profound appreciation to my supervisor, **Er. Parneet Kaur**, for their insightful comments, persistent support, and advice as we worked to finish this project, **A System for Hotel Management: "Your Gateway to Effortless Management''.** Even though we are the ones working on this project, it wouldn't be feasible without the participation of many other individuals. Their collaboration has enabled us to complete this project effectively.

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CHAPTER 1.

INTRODUCTION

1.1 Identification of Need: -

A hotel management system's need must be determined by taking into account the demands and problems that the hospitality sector faces, which the system's implementation may help to address. Here are some important things to think about: -

- **Effective Reservation Management:** It's important to handle reservations well to prevent duplicate bookings and provide easy check-ins and check-outs.

- **Improvement of the Visitor Experience:** Automating activities such as billing, check-in/check-out, and room service orders to give visitors a better experience.

- **Inventory management:** It is the process of effectively controlling hotel assets including personnel, rooms, and facilities in order to increase revenue and occupancy.

- **Multi-Property Management:** Centralising data management and operations for hotel chains or companies with several locations.

- **Maintaining profitability and transparency**: It is via accurate financial tracking, invoicing, and reporting is known as financial management.

- **Guest Data Security:** Ensuring that guest data is protected and that data protection laws are followed.

- **Integration:** The requirement to include one system with another, such payment gateways and online booking platforms.

- **Scalability:** The capacity of a business, whether it be a major resort or a small boutique hotel, to adjust to the expanding demands of the enterprise.

The first step in developing a hotel management system that may boost client happiness, expedite processes, and increase profitability in the hospitality sector is identifying these demands.

1.2 Identification of Problem: -

Finding issues with a hotel management system is essential to enhancing its effectiveness and usefulness. The following are some typical problems and difficulties with hotel management systems:

- **Ineffective Check-In/Check-Out**: Protracted procedures for checking people in and out can irritate visitors and lower employee output.

- **Room Assignment:** A guest's happiness may be impacted if it is difficult to allocate a room that satisfies their preferences and needs.

- **Inventory Control:** Ineffective room and resource management might result in either overbooking or underuse.

- **Limited Reporting:** It might be difficult to make judgements based on data when there is a lack of sufficient analytics and reporting capabilities.

- **Maintenance Scheduling**: Ineffective scheduling of maintenance can cause disruptions to guests and downtime in rooms.

- **Integration Challenges**: The inability to easily integrate with other systems, including property management software, payment gateways, or online booking platforms.

- **Staff Training:** Employees are not receiving enough guidance or assistance in using the system efficiently.

- **Inventory and Stock Control:** It can be difficult to keep track of food and drink supplies, which can result in shortages or waste.

One of the most important steps in enhancing a hotel management system is identifying these issues. Resolving these problems can result in happier customers, more efficient operations, and more money coming in for the hotel.

CHAPTER 2.

LITERATURE REVIEW/BACKGROUND STUDY

2.1 Review of the literature: -

Table 01: Review of the literature authors

S. No	Author(s)	Focus/Finding
01.	Sanni Abubakar Omuya et al.	"Online computerized Hotel Management System''. The purpose of this research, computerized hotel management system with Satellite Motel Ilorin, Nigeria as the case study is to understand and make use of the computer to solve some of the problems which are usually encountered during manual operations of the hotel management.
02.	Jingda Yang et al.	"Research and Design of Hotel Management System Model". The overall mission of system development is to make the office staff can quickly and easily complete the hotel guest room management task.
03.	Akazue, et al.	"Enhanced Hotel Management Information System for Multiple Reservation Booking". Despite all the advancements, most hotel management software is far from being perfect in satisfying diverse users' needs in the aspect of multiple reservations with breaks in check-in and check-out.
04.	Md. Noor-A-Rahim et al.	"An Electronic Intelligent Hotel Management System for International Marketplace". To compete with the international market place, it is crucial for hotel industry to be able to continually improve its services for tourism.
05.	Kesh Prasad et al.	"Measuring Hotel Guest Satisfaction by Using an Online Quality Management System". This study analyses hotel guest satisfaction using an electronic guest feedback system based on web and Internet technologies.
06.	Wei Wei et al.	"Design and Implementation of Hotel Room Management System". With the continuous improvement of people's living standards, people's spare time life become more colourful than before. More and more people will choose traveling as a form of entertainment, so did the development of hotels for people who were traveling or on business.
07.	Md. Noor-A-Rahim et al.	"An Electronic Intelligent Hotel Management System for International Marketplace". This paper introduces a web based intelligent that helps in maintaining a hotel by reducing the immediate involvement of manpower.
08.	Teng-Yuan Hsiao et al.	"Establishing attributes of an environmental management system for green hotel evaluation". This study establishes attributes of an environmental management system (EMS) for the hotel industry in Taiwan to create an instrument to help address green hotel auditing.
09.	Akash et al.	"Hotel Management System". The hotel management system maintains records of visitors and offers tools for booking, registering, creating bills, entering room rates, etc. Manual systems have drawbacks, such as limited data storage and slow operation
10.	Guo Chen et al.	"Analysis and Design of Five-Star Hotel Management Information System Based on UML". With the development of the tourism industry, the competition of the hotel industry is becoming more and more intense. Effective integration of all kinds of resources inside the hotel can improve the efficiency of labour in the hotel, reduce the transaction cost, and improve the operating profit of hotel.

2.2 Exiting Solution: -

The features, scalability, and technological stack of a current hotel management system solution might differ significantly. The Opera Property Management System (PMS) by Oracle is a well-liked and often utilised alternative, despite the fact that there are many software suppliers and solutions offered. An overview of this system is given below:

Oracle Hospitality Opera PMS *is the solution name.*

Advantages:

- ❖ Improved visitor experience with expedited check-in and check-out procedures.
- ❖ Effective handling of reservations and allocation of rooms.
- ❖ Precise financial reporting and invoicing.
- ❖ Scalability to accommodate both big hotel chains and little boutique hotels.
- ❖ Connectivity to external systems to increase capabilities.
- ❖ Thorough training and assistance for users.

2.3 Problem Definition: -

A hotel management system's problem definition lists the difficulties and problems that make the creation or enhancement of the system necessary. This is an example of a hotel management system problem definition:

Problem Statement: An effective and integrated hotel management system is desperately needed in the hospitality sector to solve the following issues and deficiencies:

- ❖ Reservation Management: The way reservations are currently managed is prone to mistakes, which can result in overbooking, duplicate bookings, and unhappy customers.
- ❖ Procedures for Checking in and Out: Manual check-in and check-out procedures take a lot of time, which irritates guests and makes hotel employees inefficient.
- ❖ Billing and Payment Processing: Inaccurate invoicing, a delay in sending out invoices, and problems accepting different payment methods lead to disagreements and monetary losses.
- ❖ Room Assignment: It may be difficult and frequently manual to assign rooms to visitors that satisfy their needs and preferences, which can result in less-than-ideal guest experiences.

- ❖ Inventory management: Ineffective control over amenities and room availability can lead to lost income opportunities and inefficient operations.
- ❖ Security and Data Privacy: Trust and reputation are seriously threatened by worries about the security of guest data and the possibility of data breaches.
- ❖ Reporting and Analytics: The ability to make data-driven decisions for hotel operations and pricing strategies is hampered by the lack of real-time, comprehensive reporting and analytics capabilities.
- ❖ Integration challenges: Operational efficiency is hampered by the system's inability to be easily integrated with other platforms, including online booking systems, payment gateways, and property management systems.
- ❖ Scalability: As hotels or hotel chains develop, the current systems frequently find it difficult to keep up with the rising demand and operational complexity.
- ❖ Outdated Legacy Systems: A lot of hotels still operate with antiquated, unsupported systems that are hard to maintain, don't have the latest capabilities, and make operations less efficient.

2.4 Goal/Objective: -

A hotel management system's goals and objectives specify its intended outcomes. The system's development and execution are guided by these objectives. The following are some common hotel management system aims and objectives:

Overarching Objective: To provide an effective, integrated, and user-friendly hotel management system in order to optimise income, improve guest happiness, and simplify hotel operations.

Particular Goals:

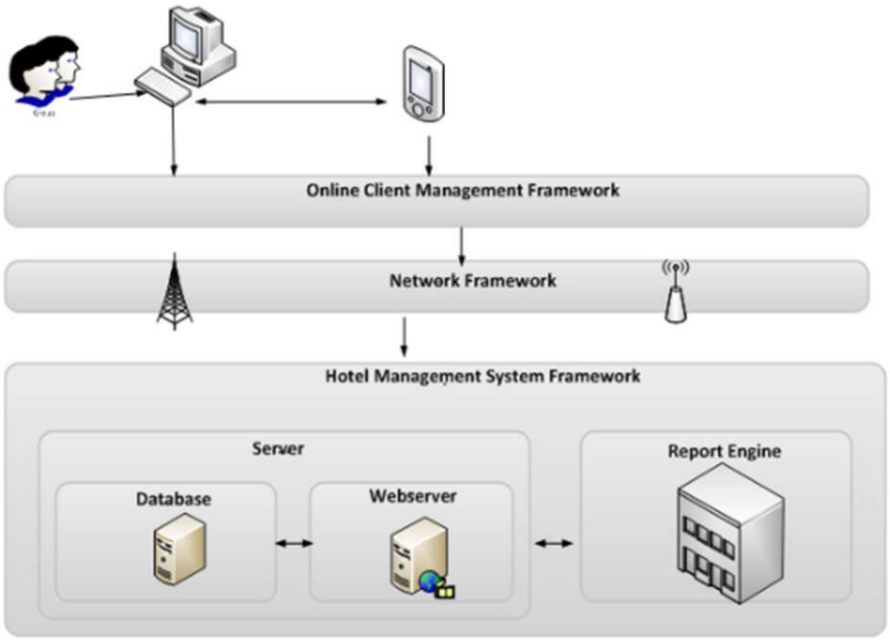
- ❖ **Effective Reservation Management:** Provide real-time information on hotel availability while streamlining the creation, modification, and cancellation of bookings.
- ❖ **Smooth Check-In/Check-Out:** Offer a simple, fast check-in and check-out procedure using mobile check-in and keyless entry.
- ❖ **Precise Invoicing and Payment:** To avoid disagreements and minimise financial mistakes, automate billing computations, guarantee precise invoicing, and provide a range of safe payment alternatives. The goal of optimal room assignment is to maximise visitor happiness by allocating rooms according to guest preferences, needs, and availability.

- **Inventory Control:** To avoid overbooking, save operating expenses, and increase revenue potential, effectively manage room inventory and resources.
- **Enhanced Data Security:** Put strong security measures in place to guard visitor information and make sure data protection laws are followed.
- Full Reporting and Analytics: Make data-driven decisions about pricing, occupancy, and guest preferences easier by offering real-time reporting and analytics capabilities.
- **Integration Capabilities:** To maximise efficiency, seamlessly link with other systems, including payment gateways, property management programmes, and online booking platforms.
- **Scalability:** Make sure the system can grow to meet the demands of an expanding hotel or chain without sacrificing functionality or performance.
- **Modernization:** Install a contemporary hotel management system with the newest features and technologies to replace or enhance outmoded legacy systems. Enhance the visitor experience by using mobile services, personalised touches, and smart room features. Encourage environmentally beneficial behaviours and sustainable objectives, such as trash minimization and energy management.
- **Multi-Property Management:** Permit the central administration of several hotel locations inside a chain or group.

CHAPTER 3.
Design flow/Process

3.1. Evaluation & Selection of Specification/Features: -

Framework:



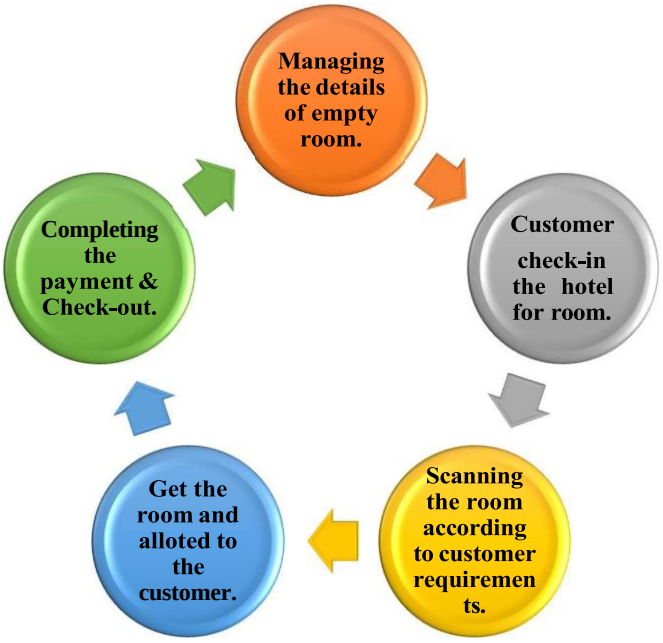
A methodical procedure is employed in the assessment and choice of features and specifications for a hotel management system in order to ascertain which functions and requirements best suit the demands and objectives of the establishment. Here's a detailed guide to help you assess and choose these features and specifications:

- **Assemble the needs:** Start with obtaining needs from important parties, such as end users, management, and hotel employees. All facets of hotel operations, including bookings, arrival and departure procedures, invoicing, room assignment, and reporting, should be covered by these specifications.
- **Set Prioritisation for Needs:** Sort the criteria into priority lists according to how important and relevant they are to the hotel's operations. Determine which features and functions are "must-have" and which are "nice-to- have."

- **User Opinion:** Hold seminars and talks with hotel personnel and end users to get their feedback on the required features. Their opinions and direct experience are priceless.
- **Market Analysis:** Examine current hotel management systems and best practises in the sector. Determine the characteristics of effective systems that are often present.
- **Scalability:** Think about how scalable the system is. Will it be able to expand to meet the demands of the hotel, maybe to accommodate the installation of new hotels in a chain?
- **Integrity-related Skills**: Evaluate the necessity of integrating your system with other systems, such property management software, payment gateways, and online booking platforms. Choose the integrations that are most important.
- **Data Safety and Adherence:** Make that the system conforms with applicable data protection and payment industry standards and has strong security mechanisms to safeguard visitor information.
- **Improving the Visitor Experience:** Think of amenities that can improve the visitor experience, such mobile request for room service, mobile check-in/check-out, and customised suggestions.
- **Analytics and Reporting:** Establish the degree of analytics and reporting needed to make wise choices about price, occupancy, and guest preferences.
- **Environmental Factors to Consider:** Evaluate aspects pertaining to waste reduction, energy management, and green activities if sustainability is a top goal.
- **Financial Restraints:** Analyse the funding allocated for the system's implementation and upkeep. This will affect the characteristics that are chosen.
- **Respect for Regulations**: Verify that the system satisfies all applicable laws and industry requirements, including those pertaining to data protection and payment card industries.
- **Easily Usable:** Give top priority to features and an easy-to-use interface that reduce hotel staff training needs.
- **Accessibility on Mobile:** Identify the need for mobile features like keyless access, smartphone reservations, and check-in/check-out.
- **Personalization:** Think about if the system can be tailored to the particular requirements of the hotel and its properties.

- **Vendor Assessment:** Investigate and assess various software providers or solutions that provide the features and specifications that correspond with the determined priorities and needs.
- **Testing and Prototyping:** Create working prototypes or do pilot tests to assess the practicality of the chosen features and get user input.
- **Benefit-Cost Analysis**: To determine the possible return on investment (ROI) of putting the selected features into practise, do a cost-benefit analysis.
- **Choosing and Putting into Practise:** Choose the features and specifications that best fulfil the needs and objectives of the hotel management system after giving them a careful inspection. Work together with the selected vendor to implement and adjust the system as needed.

Flowchart:



3.2 Analysis of features and finalization subject to constraint: -

A crucial stage in the creation and deployment of a hotel management system is the analysis of features and their eventual finalization, taking limitations into consideration. It entails giving the features a thorough evaluation, ranking them, and making choices based on time, money, and resource limits. Here's how to go about doing this:

- **Feature Evaluation:** Review the list of features identified during the requirements gathering phase.
- **Prioritization:** Categorize the features into different priority levels. Consider the criticality of each feature in terms of achieving the project's goals.
- **Budget Constraints**: Determine the budget available for the development and implementation of the hotel management system.
- **Resource Availability**: Assess the availability of technical and human resources for the project.
- **Time Constraints:** Consider the project timeline and deadlines for implementation. Determine whether certain features might extend the project timeline beyond acceptable limits.
- **Risk Assessment:** Evaluate the potential risks associated with including or excluding specific features.
- **Stakeholder Input:** Gather feedback and input from key stakeholders, including hotel management and staff, as well as end-users.
- **Cost-Benefit Analysis:** Perform a cost-benefit analysis to assess the potential return on investment (ROI) for each feature.
- **Customization and Scalability**: Consider whether features can be customized to meet specific needs and whether the system is scalable to accommodate future feature additions.
- **Guest Experience Enhancement: Prioritize** features that directly impact the guest experience, as this can significantly influence customer satisfaction and loyalty.
- **Environmental and Sustainability Features:** Weigh the value of sustainability features in terms of cost savings and environmental responsibility.
- **Final Selection:** Based on the evaluation, prioritize the features that align most closely with the hotel's objectives, budget, resources, and timeline. Finalize the feature set for the hotel management system, taking into account constraints and priorities.
- **Documentation:** Document the rationale behind the feature selection process, including the reasons for including or excluding specific features.
- **Continuous Review:** Recognize that feature selection is an ongoing process. As the project progresses and new needs arise, be prepared to adapt and refine the feature set accordingly.

By thoroughly analysing and finalizing features subject to constraints, you can create a well-balanced hotel management system that maximizes benefits, aligns

with the available resources, and ultimately helps the hotel achieve its operational and customer satisfaction goals.

3.3 Design Process: -

Planning, developing, testing, and implementing the system are all steps in the organised process of designing a hotel management system. An outline of the hotel management system design process is provided below:

- **Gathering Requirements:** This process involves establishing the project objectives, determining user requirements, and creating technical and functional requirements for the system.
- **Concept Generation:** Designers will provide a variety of design ideas for the system based on the requirements. These ideas may include various sensor technologies, alerting mechanisms, user interfaces, and integration possibilities.
- **Evaluation and Selection:** Designers will assess every idea in light of its viability, efficiency, and other aspects. The most effective idea or ideas will then be chosen to advance.
- **Designing a prototype:** Designers will create a model of the chosen design idea. The system's functioning will be tested, any design flaws will be found, and the concept's viability will be evaluated with the aid of the prototype.
- **Testing and Validation:** Once the prototype is complete, it will be examined to see whether it satisfies user demands and specification. Functional testing, user acceptability testing, and performance testing are all part of the testing process.
- **Finalisation and Refinement:** Designers will tweak the design based on test findings, correcting any problems found. They will complete the design by adding all relevant features and requirements.
- **Production and Field Deployment:** After the design is complete, it will be produced and used in the field. Vehicles will be equipped with the technology, and drivers will get training on how to utilise it efficiently.

The needs, objectives, and limitations relevant to the project will determine how far along in the design process it is. These broad processes, however, might serve as a foundation for the design development.

CHAPTER 4.
RESULTS ANALYSIS AND VALIDATION

4.1 Implementation of design solution: -

The process of implementing a hotel management system using modern engineering tools involves selecting development tools, setting up a version control system, adopting an Agile methodology, and implementing a modern database management system.

The backend development involves creating APIs for data retrieval and communication, while the frontend development builds user interfaces using web technologies. Security measures are implemented to protect guest data. Testing and quality assurance are done using frameworks and tools, and continuous integration/continuous deployment pipelines automate the process. Monitoring and logging tools track system performance, user training is developed, and a rollout plan is executed.

Maintenance and support are provided, and scalability and performance optimization are prioritized. Documentation and knowledge transfer are maintained to facilitate knowledge transfer among team members.

4.2 Results & Testing: -

It fulfils specifications, operates as anticipated, and offers users a flawless experience. Numerous testing methodologies are used in the process, including as performance, security, usability, and functional testing. The testing procedure and anticipated outcomes are summarised as follows:

Functional Examination:

- Management of bookings: Verify that the system appropriately depicts room availability by testing its capacity to make, amend, and cancel bookings.
- Check-In/Check-Out: Confirm that the system can effectively create room keys, check visitors in and out, and update the status of rooms.
- Billing and Payment: Verify billing computations, implement rebates, and appropriately handle payments.
- Reporting: Confirm that the system produces correct information on revenue, occupancy, and other important variables.

Anticipated Outcome: The system performs all essential tasks with accuracy and efficiency, devoid of mistakes or inconsistencies.

Usability Evaluation:

- Make sure the staff and visitor user interfaces are clear and simple to use by testing them.
- Evaluate how easy it is to make reservations, check in and out, and manage reservations.
- Obtain end users' opinions on the system from them.

Anticipated Outcome: The system is perceived as user-friendly by users, who also provide good comments on its use.

Examining security:

- Conduct penetration testing to find weaknesses and evaluate the system's defence against intrusions.
- Make sure that information is sent, stored, and safeguarded securely.
- Make that the right authorization and authentication procedures are in place.

Anticipated Outcome: There are no significant vulnerabilities discovered, and the system is safe.

Evaluation of Performance:

- Test the system's performance under peak and anticipated loads. Play as many concurrent users as possible booking, checking in and out, and using services.

Anticipated Outcome: The system manages the anticipated workload with few hiccups or malfunctions. Reaction times fall within reasonable bounds.

Testing for user acceptance (UAT):

- Incorporate stakeholders and end users into the system's real-world testing.
- Tasks like booking reservations, checking in and out, and producing reports should be completed by users.
- Get input and take care of any problems found during UAT.

Anticipated Outcome: The system's performance meets end users' expectations and needs, and they are happy with it.

Testing for Regression:

- Retest the system after resolving any issues discovered in earlier testing stages to make sure that modifications haven't brought up any new difficulties.

Anticipated Outcome: No fresh problems or regressions are found.

Record-keeping and Reporting:

- ❖ Record every test case, test outcome, and problem that is discovered.
- ❖ Write a thorough test report that includes a summary of the results and testing procedure.

Anticipated Result: A comprehensive summary of the system's performance is given by a well-documented testing procedure and results.

Comments and Enhancements:

- ❖ Get input from stakeholders and testers to determine what needs to be improved.
- ❖ Prioritise and address problems and improvements for upcoming releases.

Anticipated outcome: A workable strategy for enhancing the system in light of user input and problems found.

CHAPTER 5.
CONCLUSION AND FUTURE SCOPE OF WORK

5.1 Conclusion: -

In summary, a hotel management system is essential to improving the client experience and optimising hotel operations. It includes a number of tasks that are necessary for effective hotel administration, such as bookings, check-in and check-out, invoicing, and reporting.

Modern technical techniques and technologies are essential for the entire hotel management system design and deployment process. This guarantees the system's dependability, security, and ease of use. It entails choosing the right technology stacks, evaluating usability, putting security measures in place, optimising performance, and adhering to regulatory and industry requirements.

Validating the system's performance, security, usability, and usefulness requires a testing step. It guarantees that the system satisfies the needs and expectations of the personnel and visitors alike, while also conforming to laws pertaining to data privacy and industry norms.

Hotel management systems have a lot of room to grow in the future. Innovation is expected in a number of areas, including integration with future technology, improved guest experiences, sustainability concerns, and a mobile-first strategy. These developments will meet the changing requirements of the hospitality sector as well as the rising expectations of visitors.

In the end, a well-thought-out and executed hotel management system enhances visitor pleasure, which is essential for success in the hospitality sector, in addition to increasing operational efficiency. Hotel management systems will continue to be an essential resource for hoteliers all over the world as long as they can adapt to new technology and the shifting demands of the hospitality industry.

5.2 Future Scope: -

Future developments in technology and shifting business demands can greatly expand the potential applications of hotel management systems. The following are some crucial areas for hotel management system innovation and development in the future:

- **Improved Visitor Experience:** More customization of the visitor experience using data analytics and AI-powered suggestions.

- **Mobile-First Strategy:** creation of increasingly sophisticated mobile applications for concierge services, check-ins, check-outs, and bookings.
- **Solutions Without Contact:** A stronger focus on contactless payment methods, check-in, and check-out, which have become increasingly important as a result of the COVID-19 epidemic.
- **Intelligence in business and data analytics:** Enhanced data analytics for consumer insights, demand forecasts, and pricing strategies, predictive analytics for inventory control and maintenance.
- **Blockchain Technology for Openness and Security:** Use blockchain technology to increase financial transaction transparency and guest data security.
- **Multi-Asset Administration**: Hotel chains will keep looking for ways to streamline data management and operations across several locations.
- **Inclusivity and Accessibility**: Taking into account elements that make accommodations for visitors with impairments and including bilingual support for visitors from abroad.
- **Advanced Business Intelligence and Reporting**: Tools for data visualisation and real-time reporting that help managers make strategic decisions based on income, occupancy, and visitor preferences.
- **Strengthened Security Protocols:** Sophisticated cybersecurity safeguards against online dangers and data breaches.
- **Personalization and Expandability:** Systems that are easily customizable to fit the distinct requirements of various hotels and expand to accommodate business expansion.

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User Outcome: -

Fig1: LOGIN PAGE

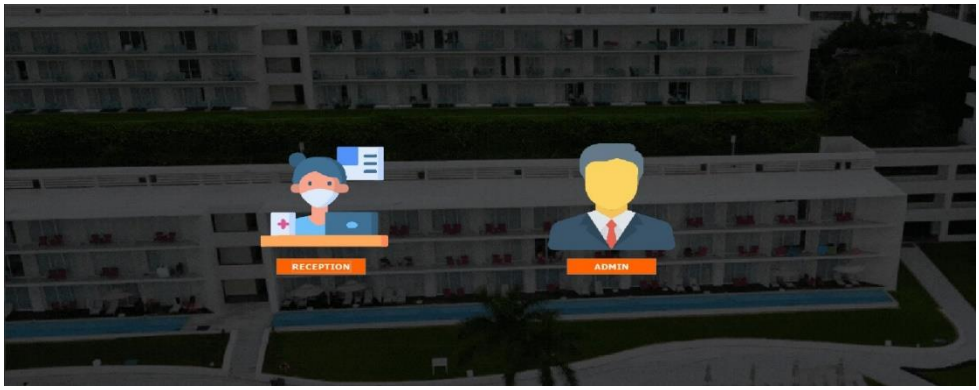

Fig 2: DASHBOARD

Fig 3: RECEPTION PAGE

Fig 4: ADMIN PAGE

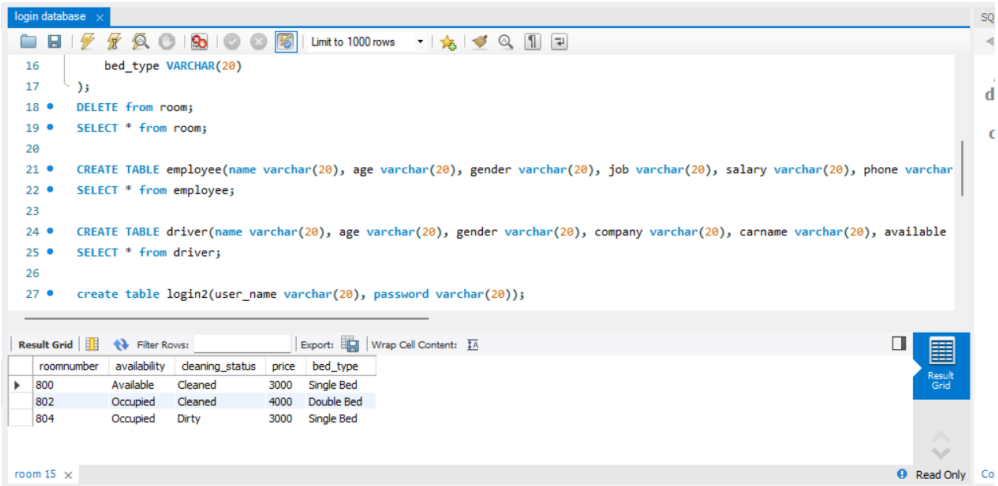

Fig 5: SQL DATABASE