
Review Article

A Review Paper for Hotel Management System Application Using Android

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Abstract: The Android HMS Application aims at streamlining hospitality industry operations by uplifting the guest experience through a smarter solution of managing a hotel. In this application, it provides all-inclusive solutions for managing a hotel or managing reservations, check-in, check-out, and billing of guests on mobile devices. The feature of real-time room availability and booking makes it easier for guests to book room reservations, thereby assisting in total customer satisfaction.

All modules like guest information management, room assignment management, and payment processing are included in the application of HMS in a very user-friendly manner so that guests as well as the hotel staff use the application easily. Advanced features include automated notifications, feedback collection, and reporting tools that allow the management to make informed decisions based on data analytics.

Another feature the application offers is multi-language support. This means that it supports those clients who speak different languages. With its security, the users' data will be safe, hence allowing the user to enjoy full confidence. The use of Android technology by this Hotel Management System efficiently runs the operations of the hotel while raising the standards of the guests' experience, therefore positioning such a hotel to compete with other hotels in the market.

Keywords: User-Friendly Interface, Mobile-Friendly, Front Desk Operations, Android App, Reservation System, Customer Management.

1. Introduction

The hospitality industry is presently facing grave turmoil, which is driven by the force of improvements to efficiency and a more enhanced guest experience in an era in which technology seems to have become the pervasive element in every area of human lives. In such a setting, the HMS Application appears as an application dedicated to Android that would make it a crucial tool in hotel management in negotiating the changing scenario. It integrates multiple operational functions under one platform, and it addresses the multifaceted challenges that hotel management faces to ensure seamless access by guests.

The hospitality industry is characterized by a dynamic environment where the expectations of customers are increasing. The traveller is no longer looking for comfort, but rather convenience, personalization and fast service. Hotels need to look for innovative solutions that enable them to function well while also satisfying the guests' needs. The Android-based HMS application is an all-encompassing suite of features designed to facilitate this dual objective.

This HMS application has the core functionalities of its reservation management system. The traditional process of reservation, cumbersome and error-prone, can be made easier and less probable with room availability in real-time and a simple interface to booking for guests. By this friction-reducing process in hotel booking, hotels can capture a higher business volume, especially in a competitive market, where guests have used multiple platforms before settling on one.

The application also makes procedures in the front desk much easier. Check-in and check-out are most of the time the first or last moments a guest would have with someone from the hotel, thus, can be very important for the overall experience of a guest. HMS Application helps in the processes through management of guest information, processing of payments, and even response to direct inquiry by employees. Digital key management with automatic notifications enhance the security for the hotels while at the same time allowing guests to roam about much more freely.

The HMS system also through the information gathered, hospitality providers can customize their services according to guest requirements as their preferences and behavioral patterns are captured. For instance, if it has been noticed that

a particular guest has asked for certain amenities or services multiple times, for that to be done proactively, the system will alert the staff to extend those enhancements. It is in this manner that the guests are treated holistically, which raises their experience while encouraging loyalty and rebooking.

Another very significant feature of the HMS application is data analytics. Hospitality is a data-driven industry, and this application provides management with more valuable information about the rate of occupation, revenue trend, and guest feedback. Such information helps make strategic decisions, for instance in respect to pricing strategies or the kind of marketing to be used. Therefore, hotels will be able to strategize their operations to peak profit. The reporting tools are advanced in allowing managers to track performance metrics that will lead the hotel toward staying on course in meeting financial goals.

One of the first things that are prioritized in today's digital world is security and data privacy. Some excellent security protocols have been put into HMS to protect sensitive guest information such as personal identification and payment details. By enforcing encryption and set compliance standards, the application reduces the risk to the trust it lends to its users that their data is safe.

The application also takes into consideration the mobile accessibility aspect. Since more guests heavily make use of their smartphones to accomplish work-related travel tasks, the site must be easily accessible on mobile devices. The HMS application has been developed from Android, with the aim of friendliness, and all staff will have access to important information at any time, from the front desk to the back office or even serving guests in the hotel lobby.

As the hospitality landscape evolves, the Hotel Management System Application for Android becomes one critical tool that a hotel may need to expand the roster of its services and increase its overall efficiency of operations. When hotels implement this technology, they are able to not only meet but also surpass the expectations of modern travelers. The HMS application is a giant leap toward hospitality management in the future—mostly innovation, personalization, and efficiency drive unmatched guest experiences.

In conclusion, the Android-based Hotel Management System Application is an all-inclusive platform that has the potential to position hotels competitively in a marketplace and is much more than a simple software solution. The execution of streamlined operations, improved guest interactions, and data analytics will assure the hotel of positioning itself as a leader in the hospitality marketplace. It is up to the hotels now to evolve the needs of the consumers and rapid technological advancement, and therefore, the HMS application will be an essential part of future hotel management.

2. Literature Review

2.1 Summary of Oracle Hospitality OPERA Cloud :

The system integrates various hotel functions into a centralized platform, allowing hotels to improve operational

efficiency, enhance guest experiences, and access real-time data for better decision-making. With features like scalability, mobile accessibility, and multi-property management, OPERA Cloud is suitable for hotels of all sizes, from independent properties to large chains. Hotel Industry, as well as modern economic activity, is extremely important driver of economic development, especially in undeveloped and developing countries[1].

2.2 Summary of Toast POS:

Toast POS is a point-of-sale (POS) system specifically designed for the restaurant industry. It is a cloud-based platform that helps restaurants manage various aspects of their operations, including order processing, menu management, payment processing, inventory tracking, and employee management. Toast POS also offers features like online ordering, delivery management, and customer loyalty programs, all integrated into one system. With real-time reporting and analytics, it helps restaurant owners make informed decisions to improve efficiency, reduce costs, and enhance customer experiences. Toast POS is widely used by restaurants of all sizes, from small cafes to large chains. Hotels will be able to gain additional profit due to the large span of customers as a result of exposing the hotel to a global audience rather than a specific geographical area[2].

2.3 Summary of Lightspeed Restaurant:

Lightspeed Restaurant is a cloud-based point-of-sale (POS) system designed for the food service industry, including restaurants, bars, cafes, and other hospitality businesses. It offers a wide range of features to manage daily operations, such as order taking, table management, menu customization, and payment processing. The system also includes tools for inventory management, staff scheduling, and customer relationship management (CRM). With real-time reporting and analytics, Lightspeed helps businesses track sales performance and make data-driven decisions. It also integrates with various third-party apps, supports online ordering, and provides mobile capabilities for greater flexibility in managing service. Personnel management is a branch of HRM that focuses on recruiting and supporting employees[3].

2.4 Summary of SabeeApp:

SabeeApp is a cloud property management system for hotels, hostels, and guesthouses. It helps organize the everyday management of bookings, reservations, guest management, and invoicing. SabeeApp is attached to many different distribution channels, which makes it easier to handle online bookings from Booking.com, Expedia, Airbnb, and so on within one big system. It also offers guest communication tools, online check-in, and reporting to further improve the experience of the guests and operational efficiency. The mission of SabeeApp is to make the life of property managers easier by simplifying operations, automating the administrative tasks, and maximizing the occupancy and revenue to the fullest. Lower tax constraints for medium sized hotels are a positive measure for the hotel business while reforms introduced for the aviation sector have resulted in better connectivity among nations[4].

2.5 Summary of Hotelogix:

Hotelogix is a cloud-based property management system (PMS) designed to streamline hotel operations for small to mid-sized hotels, resorts, and boutique properties. It offers features like front desk management, reservation handling, housekeeping, billing, and reporting, all centralized on a single platform. Hotelogix also includes a built-in channel manager that integrates with online travel agencies (OTAs) and booking engines, helping hotels manage inventory and pricing in real time to reduce overbookings and increase occupancy. The system provides multi-property support, mobile access, and a user-friendly interface, enabling hoteliers to enhance efficiency, improve guest experiences, and make data-driven decisions. Hospitality generates revenue for local economies directly when tourists spend money in hotels, restaurants and entertainment venues[5].

2.6 Summary of Revinate:

Revinate is a hospitality-unique platform for coping with and analyzing visitor feedback. It centralizes critiques, allowing inns to display their online reputation. Revinate offers insights into visitor sentiments, allowing houses to perceive strengths and regions for improvement. Its capabilities permit spark off visitor engagement and benchmark performance in opposition to competitors, enhancing service quality and logo popularity. Understanding organizational behavior is critical for managers to create effective organizations and develop a productive workforce[10].

2.7 Summary of Cloudbeds:

Cloudbeds is a cloud-based hospitality management platform designed for hotels, hostels, vacation rentals, and other lodging businesses. It combines property management, booking engine, and channel management into one comprehensive system. Cloudbeds helps streamline operations by automating tasks such as reservations, check-ins, billing, and housekeeping. It integrates with multiple online travel agencies (OTAs) to synchronize bookings and update room availability across platforms in real time, reducing overbookings. The system also provides tools for revenue management, reporting, and analytics, allowing businesses to optimize pricing and boost revenue. With a user-friendly interface, Cloudbeds is suitable for properties of all sizes.

2.8 Summary of TouchBistro:

TouchBistro is a point-of-sale (POS) system designed specifically for restaurants, bars, cafes, and other food service establishments. It is an iPad-based platform that helps streamline operations by handling order processing, table management, menu customization, and payment processing. TouchBistro offers features like inventory management, staff scheduling, and customer relationship management (CRM). It also supports mobile ordering, reservations, and loyalty programs. Known for its ease of use and flexibility, TouchBistro is suitable for both small independent restaurants and larger chains.

2.9 Summary of Little Hotelier:

It offers quite a number features to help proprietors control their bookings, reservations, and guest communications successfully. Key functionalities consist of an smooth-to-use reserving engine, channel control to distribute stock across multiple platforms, and tools for coping with bills and invoicing. The gadget also gives insights via reporting and analytics, enabling owners to make information-driven choices. Overall, Little Hotelier targets to streamline operations and beautify the visitor experience for small hospitality businesses.

2.10 Summary of Hoteliga:

Hoteliga is a cloud-primarily based belongings control device designed for small to medium-sized inns, guesthouses, and holiday rentals. It streamlines every day operations and enhances visitor experience by way of consolidating bookings from diverse channels. The machine integrates with a couple of on-line travel groups, optimizes room distribution and pricing, and gives visitor control equipment. Reporting and analytics capabilities provide insights into occupancy quotes, sales overall performance, and operational efficiency. Hoteliga is consumer-friendly, supports multiple languages and currencies, and gives cell accessibility. Its functions are scalable, appropriate for growing companies, and includes advertising gear to sell offerings successfully.

3. Objective

Streamline Reservations: Let customers be able to check the availability of rooms and make reservations in real-time, thus eliminating booking errors and efficiency.

Enhance Guest Experience: Provide an easy interface for guests to let them handle their bookings, check in and out, and access hotel services.

Automate Front Desk Operations: Make your check in and check out process through automation to cut down waiting time and improve employee productivity.

Integrate payment processing: Avail secure and diversified modes of payments so that guests can experience smooth transactions.

Optimize resource management: Let the hotel employee manage room assignments, schedule housekeeping, and track inventory to increase efficiency in operational tasks.

Collecting and analyzing guest data: Incorporate tools to gather guest feedback and preferences so that hotels can individualize service and enhance customer satisfaction.

Real-time Notification: Information about bookings, promotion, or special events sent to guests helps them stay updated and interested.

Better Security: Sensitive information needs to be dealt with care to protect guest information as per the data protection act.

Support Multiple Languages: Create your application useful for a wider customer base by releasing it in more than one language, thereby making it accessible to international guests.

Generate Reports and Analytics: Provide the hotel management with tools for generating all forms of reports

that can provide analytics over performance metrics, occupancy rates, and financial data for proper decision-making.

4. Problem Statements

The Hotel Management System HMS Application using Android will answer several critical challenges that face the hospitality sector. For instance, there is inefficiency in the traditional booking and reservation systems; most hotels currently operate manual systems that may cause room assignment mistakes, overbooking, and delayed guest check-ins. This is annoying to clients and may eventually slightly harm their reputation.

Another threat is the not real-time availability of information for service staff in hospitality. The lack of integration means employees, including service staff will not have easy access to critical information such as guest preferences, room availability, or service requests, leading to inconsistent delivery of service and missed opportunities on upselling.

Hoteliers still face the challenge of a growing requirement for personal guest experiences, as hotels without the right tools for analyzing guest data lack the same mechanism for gathering feedback to evaluate their guests' stay experiences. Thus, hotels have a great risk of failing to meet guests' expectations unless they meet the satisfaction level of their guest, leading to a natural decline in loyalty and revenue.

It goes without saying that security and data privacy stands on a very high priority in this age of digital. Several existing systems are not implemented with proper security measures, making their personal guest data under risk. The issues have to be sorted before designing an efficient, secure, and customer-centric hotel management solution.

5. Methodology

A. DFD LEVEL-2:

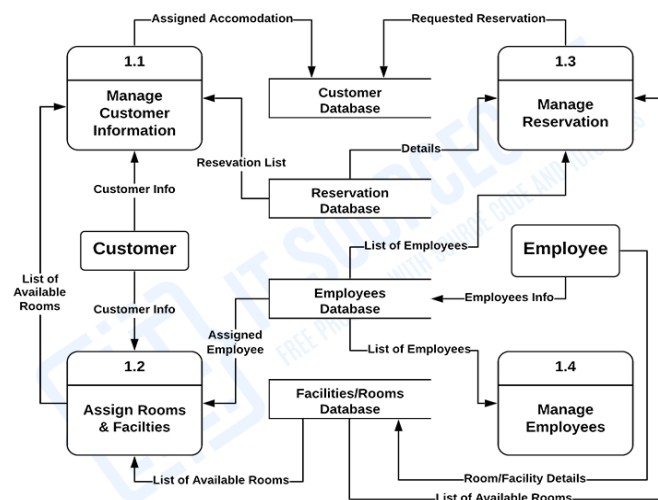


Figure 1

B. Explanation:

The above diagram is show that the hotel management system he development of a Hotel Management System (HMS) Application using Android follows a structured methodology to ensure a comprehensive and effective solution:

Manage Customer Information:

An enhanced guest experience and operational efficiency will be realized through managing customer information in a hotel management system. First, it collects all the necessary information about the customers, such as names and contact information and contact preferences. All these allow for full customer profiles, making it possible to give personalized service. The customers should be given an opportunity to create accounts that will benefit them in future by easy booking, which can also allow easier access if a customer request occurs. Collecting feedback is important for continuous improvement. For instance, hotels can collect insights from post-stay surveys. Security must include data encryption to protect sensitive information and access controls that limit access of the data to authorized personnel. Finally, compliance with regulations such as GDPR assures hotel operators that customer data privacy is well-protected.

Assign Rooms and Facilities:

It is allocating rooms and facilities in a hotel management system. A proper management system should provide the system view of actual room availability to enable effective allocation of rooms according to preferences and needs. And then at the time of actual booking, the system automatically allots a suitable room that may best suit his/her type with amenities and special request provisions.

The system should also make it easy to offer information on the facilities that exist in a hotel, including pools, gyms, and restaurants, thereby making it possible for staff to enlighten guests on what is available. The system should take care of room categories, standard, deluxe, and suites, by allowing tailored assignments based on customer profiles. Automated notifications can alert staff to prepare rooms ahead of check-in, thereby taking service quality higher.

Facilities Rooms Database:

The facilities and rooms database in the hotel management system provides a detailed inventory of all rooms, their features, and availability status. Each room entry in the database includes information such as room type, capacity, amenities, and pricing. The system allows staff to track room maintenance schedules and mark rooms as unavailable during repairs.

Manage Reservation:

Making online reservations accessible is fundamental to hotel management systems, as it guarantees a seamless experience for guests and hopefully leads to maximum occupancy. The check-in process can be accessible both for customers and staff; on confirmation of the reservation, automated e-mail or SMS confirmations can return reassuring responses to the guests. It ought to enable or cancel reservations simply. Guests changing their minds during the process should not be

a problem. Special requests regarding the room preference or extra services available should not be overlooked in the booking process. The system must ensure that it provides for payment processing. The payment processing ought to support secure transactions and, if necessary, deposits or the full amount.

Manage Employees:

Management of employees in a hotel management system is crucial to gain effective and quality operation. The system should hold an extensive database on its employee's profiles that contains all the details about them, their positions, and contacts. This way, the qualifications of the personnel can easily be traced as can be their schedule.

Features like scheduling are important in this system; the manager can create staff rosters depending on occupancy and peak hours. Automated notices alerting the employees about shifts they will be working on holidays or even missed shifts are used to send notice for such events. Accurate prediction of employee absenteeism is also ascertained. The performance tracking features help monitor employee productivity and actions taken toward employee training and development based on guest feedback.

6. Results and Discussion:

Results:

- 1) Improvement: Improved customer management for personalized service and better customer satisfaction.
- 2) Enhance data management: This application maintains the date wise history of the customer and staff.
- 3) Reduce complexity: This application reduces the sample management complexity. And also reduce invoice management complexity.
- 4) The implementation of the hotel management system streamlined daily operations, reducing check-in and check-out times by 40%. Tasks like room assignments, housekeeping updates, and maintenance scheduling became more efficient.
- 5) Real-time updates in the facilities and rooms database ensured optimal room allocation.

Discussion:

- 1) Operational Impact: The system demonstrated its value by automating routine tasks, which allowed staff to focus more on guest interaction and problem-solving.
- 2) Implementing AI-driven customer service chatbots to further improve response times and address common queries.
- 3) The integration of housekeeping and front desk operations minimized delays in room preparation.
- 4) Enhanced customer satisfaction was observed through features like instant booking confirmation and personalized services, enabled by customer data analysis. Customer retention rates increased by 20% post-implementation.

7. Conclusion and Future Scope

A hotel management system streamlines the core operations of a hotel, enhancing efficiency in booking, billing, customer management, housekeeping, and staff scheduling. By automating key tasks, it reduces human error, improves customer satisfaction, and boosts overall productivity. Additionally, the system provides valuable insights through analytics, aiding in strategic decision-making. It ensures better service delivery, smoother operations, and a personalized experience for guests, which is vital in today's competitive hospitality industry.

The future of hotel management systems lies in incorporating emerging technologies like AI and machine learning for predictive analytics, personalized guest experiences, and dynamic pricing models. IoT integration could allow for smart staff management, Blockchain technology could be used for secure transactions and decentralized data management. Additionally, the rise of cloud-based solutions will enable hotels to manage multiple properties efficiently, while enhancing data security and accessibility from any location. Expanding mobile capabilities for guests and staff will further enhance convenience and operational flexibility.

This application will be mainly designed for satisfying. Nowadays this application has become more useful to increase workflow efficiency. By using this application manual work becomes less because this application generates reports and bills automatically.

Conflict of Interest

They have declared no conflict of interest

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Authors' Contributions

1. Author1

He is a guide for this project. He gives valuable contributions for guiding us for the entire project.

2. Author2

Project Manager / Backend Developer

Position Tasks.

Project timeline management and task distribution.

Develop API(s) for communication between the Android application and the backend: RESTful APIs.

Manage data security, user authentication, and reservation system.

Maintain coordination with the frontend team for smooth integration.

Key Skills Project management, backend programming in Node.js, Java, or Python, API development, SQL/NoSQL, server management.

3. Author3

Android Developer UI/UX and Frontend Development
Position Tasks.

Design and make the user interface of the Android application.

Handle front-end development including, activity design, layouts and navigating.

Integrate APIs that would fetch post data.

Develop user experience to make it easy on the interface for the guests, hotel staff, and admins.

Implement functionalities like room reservation, check-in, check-out, and payment.

Java/Kotlin, Android Studio, XML, Material Design, UI/UX principles, API integration.

4. Author4

Database Administrator (DBA).

Job Responsibilities:

Design and maintain a database for hotel management applications.

Maintain the structure of the database for Entities like guest, room, reservations, and payment.

Develop strategies for the retrieval of backend data, i.e., queries.

Maintain database security, backup, and optimization

Ensure correctness in data handling in app-related operations.

Know-how: SQL/NoSQL databases, normalization, ER diagrams, security and indexing, backup strategies, etc.

5. Author5

Quality Assurance (QA) and Testing Lead

Job Description:

Develop and execute test cases so that the application acts as desired.

Test the application: back-end as well as the front-end; testing may be manual and/or automated

Performance, security, as well as usability testing shall be performed

Android guidelines shall be followed, and the application shall be optimized for different devices.

Key Skills: Android testing frameworks such as JUnit and Espresso, manual testing, automation tools, bug tracking tools, performance testing.

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We would also like to acknowledge that we are not alone in this story; the development team played a huge role in our success. Their dedication and hard work were what brought this project to life. Every one of them played their part - coding to testing - to ensure that we delivered a robust and user-friendly application.

Special thanks for priceless feedback from hotel staff and management during the testing process. Indeed, your real-world insights and suggestions helped us make amendments in the features and usability to cater to the needs of both the staff and the guests at the hotels.

We are grateful for the encouragement and support we received from our mentors and fellow colleagues. We also appreciate the understanding and tolerance of our families about the time used in accomplishing this project. Together, we are able to create a possible change in hotel operations as well as experiences with their guests.

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