IRJCS: International Research Journal of Computer Science ISSN: 2393-9842
Volume 13, Issue 03, March 2026 https://www.irjcs.com/archives
https://doi.org/10.26562/irjcs.2025.v1303.56

Hotel Management System

J.Arun
Assistant Professor, Department of CSE
Sengunthar College of Engineering (Autonomous),Tiruchengode, India
jarun..cse@scteng.co.in
https://orcid.org/0009-0008-4695-464
Kirtan Pandit, Manoj Manjhi, Md Shahil
Department of CSE
Sengunthar College of Engineering (Autonomous),Tiruchengode, India
kirtanrajj361@gmail.com, manojmanjhi0412@gmail.com, mdshahil844506@gmail.com

Publication History
Manuscript Reference: IRJCS/RS/Vol.13/Issue03/CSMR26.MRCS10135
Research Article | Open Access | Double-Blind Peer Reviewed Article ID: IRJCS/RS/Vol.13/Issue03/CSMR26.MRCS10135
Received: 30, January 2026, Revised: 13, February 2026, Accepted: 28 February 2026 Published Online: 25 March 2026
https://www.irjcs.com/volumes/Vol13/iss-03/56.CSMR26.MRCS10135.pdf
Article Citation: Arun,Kirtan,Manoj,Shahil(2026),Hotel Management System,IRJCS: International Research Journal of Computer Science, Volume 13,Issue 03 of 2026 pages 421-425 **Doi:>** https://doi.org/10.26562/irjcs.2026.v1303.56
BibTeX Key Arun@2026Hotel Orcid: https://orcid.org/0009-0004-9398-7488
IRJCS papers should be cited as IRJCS (International Research Journal of Computer Science, AM Publications, India 2026, ISSN 2393-9842, https://doi.org/10.26562/ijrcs.2025.v1303.56 The journal's official abbreviation is IRJCS.

Abstract: In the contemporary hospitality landscape, the demand for seamless, efficient, and data- driven management mechanisms has become increasingly vital. Traditional manual booking and paper-based administrative systems, while reliable to some degree in the past, are often time-consuming, resource-intensive, and highly susceptible to human error, double-bookings, and operational bottlenecks. To address these systemic challenges, this project presents the design and development of a comprehensive Online Hotel Management System (HMS) that aims to modernize hospitality operations through the use of secure web technologies and centralized data management. The proposed system offers a convenient, user-friendly, and transparent platform for both guests and administrators. For guests, the system provides a streamlined interface to browse room availability, manage reservations, and process payments from any location with internet access, thereby enhancing the customer experience and reducing logistical barriers to booking. For management, the system automates core functions such as room allocation, billing, inventory tracking, and staff scheduling, leading to significantly improved operational efficiency and reduced overhead costs. A primary focus of this development is the integration of core security and integrity principles. The system incorporates advanced authentication mechanisms to verify the identity of both staff and guests, ensuring that only authorized individuals can access sensitive administrative modules or personal booking data. Techniques such as Two-Factor Authentication (2FA) for staff logins and One-Time Passwords (OTP) for guest verification are integrated to prevent unauthorized access and data breaches. To maintain the integrity and confidentiality of the hospitality process, the system utilizes end-to-end encryption and Secure Sockets Layer (SSL) protocols. This ensures that financial transactions and guest personal identifiable information (PII) cannot be intercepted or altered during transmission, preserving guest anonymity where required and securing the hotel's reputation. By centralizing data and automating manual tasks, this system provides a scalable, robust solution that meets the evolving demands of the digital- first traveler while ensuring the highest standards of data security and administrative transparency.
Keywords: Hotel Management System, Digital Transformation, Web Technologies, Secure Authentication, SSL Encryption, Operational Efficiency, Automation.

I. INTRODUCTION

In today's world, travel is faster and more frequent than ever, and the hospitality industry is feeling the pressure to keep up. While the heart of a hotel will always be its service, the way that service is delivered has changed. For decades, hotels relied on paper ledgers, manual spreadsheets, and physical filing systems to keep track of guests and rooms. While those traditional methods worked for a simpler time, they are now becoming a bottleneck. Manual systems are slow, they eat up valuable staff time, and they are unfortunately prone to human errors like double-bookings or lost reservations. To fix these issues, we are moving toward an integrated Hotel Management System (HMS). The goal is to take the stress out of the "behind-the-scenes" work by using secure, modern web technology. Instead of different departments working in silos, a digital system connects the front desk, housekeeping, and billing into one central hub. This isn't just about going paperless; it's about making sure the business can run smoothly and compete in a digital-first market. At the end of the day, a great hotel should be focused on its guests, not its paperwork. By shifting to an automated system, we aren't just modernizing a building; we're freeing up the staff to focus on actual hospitality while ensuring that every guest's data is kept private and secure. This project is about building a smarter, safer, and more efficient way to host the modern traveler. Cryptography The hospitality industry has seen significant growth and transformation in recent years, driven largely by advancements in technology. One of the critical areas where technology has made a substantial impact is in the management and operations of hotels.

IRJCS: International Research Journal of Computer Science
Volume 13, Issue 03, March 2026
ISSN: 2393-9842
https://www.irjcs.com/archives
https://doi.org/10.26562/irjcs.2025.v1303.56

OVERVIEW OF HMS

The Hotel Management System is a comprehensive software solution designed to manage the core operations of a hotel in an efficient and organized manner. The primary goal of the system is to simplify hotel operations such as room reservations, guest check-in and check-out, housekeeping management, billing, and customer relationship management. This system provides a centralized platform that allows hotel staff to handle 4 multiple tasks from a single interface. It enables real-time access to room availability, guest information, and transaction records, which helps in improving response times and reducing administrative workload. The system also ensures accurate billing and smooth payment processing, enhancing the overall guest experience. When a computer handles the math, the scheduling, and the data entry, the hotel staff can actually look up from their screens and focus on the guest standing in front of them. It turns a stressful, chaotic environment into a professional, streamlined experience where the guest feels taken care of and the business stays profitable. Think of a Hotel Management System (HMS) as the "brain" of a hotel. It's a centralized software solution that handles everything from the moment a guest thinks about booking a room to the moment they check out and pay their bill. Instead of having separate piles of paperwork for the front desk, housekeeping, and the kitchen, an HMS pulls all those moving parts into one digital dashboard.

LITERATURE REVIEW

Several studies and existing systems have highlighted the importance of automation in the hospitality industry, particularly in hotel management. Traditional hotel operations, which rely heavily on manual processes, often lead to in efficiencies, errors, and poor customer experiences. Researchers have shown that implementing digital Hotel Management Systems significantly improves operational efficiency, guest satisfaction, and data accuracy. Modern systems integrate various modules such as reservation, billing, housekeeping, and reporting, offering a centralized solution for hotel operations (Sharma & Gupta, 2019). Cloud-based hotel management platforms, as discussed by Kumar (2020), allow real-time access and remote management, which is particularly useful for multi-location hotel chains. Other studies emphasize the importance of data security, customization, and scalability in software solutions to meet diverse hotel needs (Patel & Singh, 2021). Overall, the literature supports the adoption of Hotel Management Systems as a strategic investment to enhance competitiveness and service quality in the hospitality industry.

SYSTEM ANALYSIS

Introduction to Existing Hotel Management System: Existing Hotel Management Systems are software solutions widely used by hotels, resorts, and guest houses to automate and manage day-to-day operations. These systems typically include features such as online reservations, room management, guest check-in/check-out, billing, inventory control, and reporting. Most modern systems are designed to reduce manual workload, improve service delivery, and provide real-time access to data for better decision-making. Popular hotel management systems include Oracle OPERA, known for its comprehensive features used by large hotel chains. A cloud bed is a cloud-based, user-friendly platform favored by small to mid-sized hotels and hostels. Hotel Logix offers an affordable and scalable solution, especially popular in Asia. Maestro PMS provides advanced analytics for resorts and luxury hotels. RMS Cloud supports a variety of property types with strong cloud and mobile integration. Most existing weather apps provide core functionalities such as temperature, humidity, wind speed, precipitation chances, and UV index. Many apps also offer extended forecasts ranging from 7 to 15 days, enabling users to plan for upcoming weather conditions. Interactive maps, radar views, and satellite imagery are common features that help users visualize weather patterns in their area. Accuracy of forecasts. Some apps also allow users to add multiple locations, enabling quick access to weather information for different cities or travel destinations.

SYSTEM ARCHITECTURE & UML

Introduction to Existing Hotel Management System: Existing Hotel Management Systems are software solutions widely used by hotels, resorts, and guest houses to automate and manage day-to-day operations. These systems typically include features such as online reservations, room management, guest check-in/check-out, billing, inventory control, and reporting. Most modern systems are designed to reduce manual workload, improve service delivery, and provide real-time access to data for better decision-making. Popular Hotel Management System in the Market: Popular hotel management systems include Oracle OPERA, known for its comprehensive features used by large hotel chains. A cloud bed is a cloud-based, user friendly platform favored by small to mid-sized hotels and hostels. Hotel Logix offers an affordable and scalable solution, especially popular in Asia. Maestro PMS provides advanced analytics for resorts and luxury hotels. RMS Cloud supports a variety of property types with strong cloud and mobile integration. Core Features Offered: Most existing weather apps provide core functionalities such as temperature, humidity, wind speed, precipitation chances, and UV index. Many apps also offer extended forecasts ranging from7to15days, enabling users to plan for upcoming weather conditions. Interactive maps, radar views, and satellite imagery are common features that help users visualize weather patterns in their area. Accuracy of forecasts. Some apps also allow users to add multiple locations, enabling quick access to weather information for different cities or travel destinations.

1. Source Code: The implementation of the hotel management system uses a combination of modern web development technologies:

a. Frontend: HTML5, CSS, JavaScript, Bootstrap, Node JS and optionally a framework. JS for a dynamic, responsive interface.
b. Backend: PHP, or Node.js to handle server-side logic. Database: MySQL, or MongoDB for storing user data, votes, and election results securely.

IRJCS: International Research Journal of Computer Science
Volume 13, Issue 03, March 2026
ISSN: 2393-9842
https://www.irjcs.com/archives
https://doi.org/10.26562/irjcs.2025.v1303.56

Functional Testing:

Severe Hotel Alerts: likely related to emergency or critical alerts in hotels, such as during a: •Fire • Flood •Earthquake

- Security threat
- Medical emergency
- System failure.

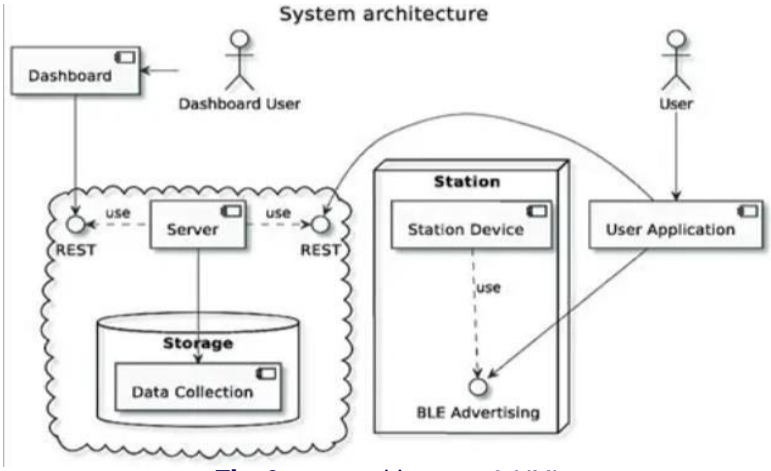

Fig: System architecture & UML

Let me give you a breakdown of what a Severe Hotel Alerts System might include, either as a standalone system or as a module within a Hotel Management System (HMS)

Disadvantage

1. High Initial Cost
- Issue: Advanced systems often require significant upfront investment in software licenses, hardware, and infrastructure. •
- Impact: Small or budget hotels may find it difficult to afford a full featured HMS.
2. Complexity & Training Requirements
- Issue: Staff may need extensive training to use the system efficiently.
- Impact: Time-consuming on boarding and possible errors due to unfamiliarity.
3. Dependence on Internet (for Cloud-Based HMS)
- Issue: If the system is hosted in the cloud, internet outages can halt operations.
- Impact: No access to bookings, billing, or guest information during downtime.
4. Security Risks
- Issue: Storing sensitive guest data (IDs,credit cards) introduces privacy and cyber attack risks.
- Impact: Data breaches can damage reputation and lead to legal issues.
5. Software Bugs & Glitches
- Issue: No system is perfect bugs can affect booking, billing, or reports.
- Impact: Operational disruption and customer dissatisfaction.
6. Costly Maintenance & Updates
- Issue: Software needs regular updates and support, which may not be free.
- Impact: Adds to the ongoing operational cost.

PROPOSED SYSTEM

The proposed Hotel Management System is a digital solution designed to overcome the limitations of traditional, manual hotel operations. This system will automate key hotel functions such as room booking, guest check-in/check- out, billing, housekeeping management, and report generation, all within a centralized software platform. Unlike existing manual or semi-automated systems, the proposed system will offer a user-friendly interface, real- time data updates, and secure database management. It will reduce human error, speed up service delivery, and improve overall customer satisfaction. Additionally, the system will be scalable and customizable, making it suitable for both small hotels and large hospitality businesses. The proposed system will also support online room reservations, enabling guests to check availability and book rooms through a web-based or mobile application. Admin users will have access to dashboards and reporting tools to monitor performance and make informed decisions.

CLASS DIAGRAM:

CORE ENTITIES AND THEIR RELATIONSHIPS

Customer Class:

- Attributes:
  - o Customer ID: Unique identifier for each customer.
  - o Name: The customer's fullname.
  - o Contact Number: The customer's phone number or other contact detail.
  - o Address: The customer's physical address.
- Role: Represents an individual making bookings.

IRJCS: International Research Journal of Computer Science
Volume 13, Issue 03, March 2026
ISSN: 2393-9842
https://www.irjcs.com/archives
https://doi.org/10.26562/irjcs.2025.v1303.56

2. Room Class:
- Attributes:
  - Room Number: Unique identifier for each room.
  - Beds Number: The number of beds in the room.
  - Floor: The floor on which the room is located.
- Role: Represents a single room that can be booked.

3. Booking Class:
- Attributes:
  - Booking ID: Unique identifier for each booking.
  - Date_from: The start date of the booking.
  - Date_To: The end date of the booking.
- Role: Represents a specific reservation made by a customer for one or more rooms.

Relationships:
- Customer to Booking:
  - A Customer can have zero or many (0..*) Bookings.
  - Each Booking must be associated with exactly one (1) Customer.
  - This indicates that a booking cannot exist without a customer, and a customer might not have any bookings yet or could have multiple.

Room to Booking:
- A Room can be part of one or many(1..*) Bookings over time (implying a room can be booked multiple times).
- A Booking can include zero or many (0..*) Rooms. This seems a bit unusual as a booking would typically include at least one room. However, it might imply that a booking record can be created before rooms are assigned, or that it allows for bookings of services without a specific room initially. If this is a hotel system, 1..* on the Booking side might be more common, indicating a booking always reserves at least one room.

PAYMENT AND ITS SPECIALIZATIONS

Payment Class:
- Attributes:
  - Reference: A unique reference number for the payment.
  - Amount: The monetary value of the payment.
- Role: Represents a generic payment transaction. This is an abstract class, serving as a base for specific payment methods.

2. Cash Payment Class:
- Attributes: (No specific attributes are listed beyond those inherited from Payment.)
- Role: A concrete implementation of the Payment class, representing payments made in cash.

3. Card Payment Class:
- Attributes: (No specific attributes are listed beyond those inherited from Payment.)
- Role: A concrete implementation of the Payment class, representing payments made by card (e.g., credit/debit card).

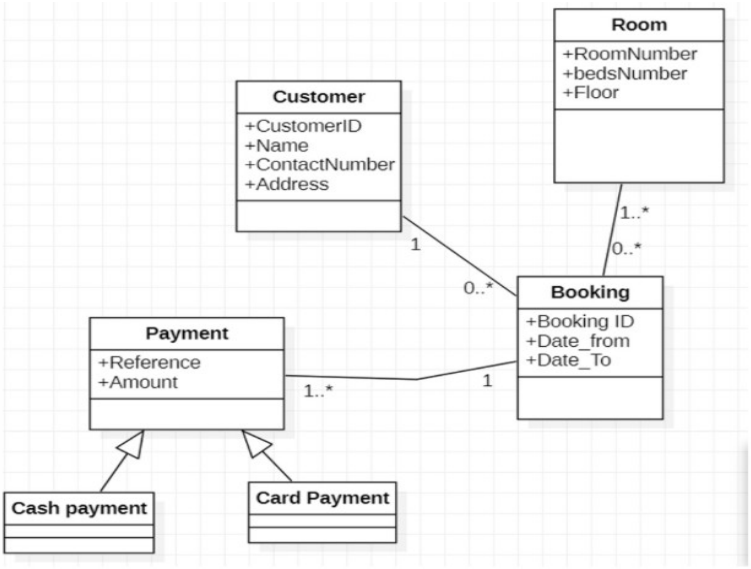

Fig.3: Class Diagram

Relationships:
- Payment Inheritance: Cash payment and Card Payment are specializations (subclasses) of the Payment class. This is indicated by the hollow triangular arrows pointing from the subclasses to the superclass. This means Cash payment and Card Payment in herit the Reference and Amount attributes from Payment.
- Booking to Payment: A Booking must be associated with exactly one (1) Payment. A Payment can be associated with one or many (1..*) Bookings.

ISSN: 2393-9842
https://www.irjcs.com/archives
https://doi.org/10.26562/irjcs.2025.v1303.56

- This implies that a single payment might cover multiple bookings, or a payment might be split across multiple installments, each linked to the main booking. The 1..* on the Payment side to Booking is less common than a 1..* from Booking to Payment, signifying that a booking can have multiple payments (installments) and a payment is for one booking. As depicted, it suggests a payment could fulfill multiple bookings, or multiple installment records for a single booking might link back to a conceptual "payment record."

CONCLUSION

The Hotel Management System serves as a comprehensive solution designed to simplify and automate hotel operations. By integrating various processes such as room booking, check-in/check-out, billing, and customer management into a single platform, the system minimizes manual work and reduces the chances of human error. It allows hotel administrators and staff to manage tasks more efficiently, saving time and improving overall productivity. Furthermore, the system enhances the guest experience by providing quick and accurate service. Features like online reservations, instant booking confirmations, and easy access to room availability make it more convenient for customers. By maintaining an organized database of guest information, the system also helps in offering personalized services, which strengthens customer satisfaction and loyalty. From an operational perspective, the Hotel Management System contributes to better data management and decision-making. The automated reporting features provide valuable insights into occupancy rates, revenue trends, and customer preferences. These insights enable management to make informed business decisions and optimize hotel performance, leading to higher profitability and competitiveness in the hospitality industry. In terms of technology, the system demonstrates the importance of digital transformation in the hotel sector. Implementing a computerized management system reduces paper work, ensures data accuracy, and promotes eco-friendly practices. Additionally, features like user authentication and data backup enhance security, ensuring that sensitive guest and financial information remains protected. At its core, the online voting system aims to simplify and secure the process of casting and counting votes through the use of web-based technologies. It eliminates many of the logistical barriers associated with traditional paper-based voting, such as the need for physical polling stations, manual vote counting, and extensive man power. Through such mechanisms, an online voting system can maintain the confidentiality, integrity, and accuracy of election data.

REFERENCES

1. Berezina,K.,Bilgihan,A.,Cobanoglu,C.,&Okumus,F.(2016).Understanding satisfied and dissatisfied hotel guests: An analysis of online reviews. Journal of Hospitality Marketing & Management, 25(1), 1-39.
2. Buhalis,D.,&Leung,R.(2018).Smart hospitality—Design and implementation. Journal of Hospitality and Tourism Technology ,9(1),2-4.
3. Cobanoglu, C., & Berezina, K. (2023). Hospitality information technology: Learning how to use it. Kendall Hunt Publishing.
4. Collins,G.R.,& Cobanoglu,C.(2017). Hospitality information technology: Learning how to use it (8th ed.). Kendall Hunt.
5. Law,R.,Leung,R.,&Buhalis,D.(2020).Information technology applications in hospitality and tourism: A review of publications from 2005 to 2019. Journal of Hospitality and Tourism Management, 42, 112-123.
6. Leung,R.,&Law,R.(2019).A review of hospitality and tourism information technology. Journal of Hospitality and Tourism Technology, 10(4), 545-560.
7. O'Connor,P.(2021).Electronic information distribution in the hospitality industry. CABI
8. Bardi,J.A.(2011).Hotel front office management (5thed.).John Wiley & Sons.
9. Hayes ,D.K.,Ninemeier ,J.D. ,& Miller,A.A. (2022). Hotel operations management (4th ed.). Pearson.
10. Jones,T.J.A.(2007). Professional management of housekeeping operations. Wiley.
11. Kasavana, M. L., & Brooks, R. M. (2015). Managing front office operations. American Hotel & Lodging Educational Institute.
12. Ninemeier,J.D.(2017).Management of food and beverage operations. AHLEI.
13. O'Fallon, M. J., & Rutherford, D. G. (2020). Hotel management and operations (6thed.).John Wiley & Sons.
14. Vallen,G.K.,&Vallen,J.J.(2013).Check-in check-out: Managing hotel operations (9thed.). Pearson.
15. Walker,J.R.(2021). Introduction to hospitality management (6th ed.). Pearson.
16. DeFranco,A.L.,&Lattin,T.W. (2015). Hospitality financial management. Wiley.
17. Enz, C. A. (2010). Hospitality strategic management: Concepts and cases. John Wiley & Sons.
18. Ivanov,S.(2014). Hotel revenue management: From theory to practice. Zangador.
19. Kimes,S.E.(2016).The evolution of hotel revenue management. Cornell Hospitality Quarterly, 57(3), 248-251.
20. Miller,A.A.,Hayes,D.K.,& Ninemeier,J.D. (2021). Revenue management for the hospitality industry. Wiley.
21. Schmidgall,R.S.(2016). Hospitality industry managerial accounting (8th ed.). AHLEI.
22. Michelli,J.A.(2008).The new gold standard:5 leadership principles for creating a legendary customer experience courtesy of the Ritz-Carlton Hotel Company. McGraw-Hill.
23. Sigala,M.(2018).New technologies in hospitality: Guest experience and business models. International Journal of Contemporary Hospitality Management.
24. Solomon,M.(2016).The heart of hospitality: Great hotel and restaurant leaders share their secrets. Select Books.
25. Benckendorff, P. J., Sheldon, P. J., & Fesenmaier,D.R.(2019).Tourism information technology (3rd ed.). CABI Publishing.