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# HOTEL MANAGEMENT SYSTEM

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# 01.Client Background

Sunrise Resort, founded in 2020 by Nisha Fernando and Danuka Perera, began with 5 cozy rooms in the serene landscapes of Sri Lanka. By 2021, it expanded to 15 inviting rooms with a team of 10 dedicated employees ensuring guests' comfort. The addition of a delightful restaurant in 2022, serving mouthwatering Sri Lankan dishes, became a beloved spot for guests to savor local flavors. In 2023, the resort introduced in-house shuttle services for guest convenience, marking a step towards enhanced experiences. Now boasting 25 comfortable rooms and a friendly staff of 30. Currently, the resort hosts about 60 guests each month, with a goal to double that number by 2024, offering both relaxing stays and memorable dining amidst Sri Lanka's breathtaking vistas.

# 02. Problem And Motivation

## 2.1. Problem Statement Breakdown:

Sunrise Resort, a medium-sized hotel, faces operational hurdles due to outdated manual processes. We aim to modernize their management systems, replacing disparate spreadsheets with efficient solutions for inventory, reservations, and finances, fostering growth and efficiency.

1. **Manual Management Processes:**

The hotel relies on manual methods for various tasks, including inventory management, reservations, restaurant orders, and financial transactions. This manual approach leads to inefficiencies, errors, and missed opportunities. For instance, front desk agents, who handle multiple responsibilities, may overlook potential leads, impacting sales conversions and customer retention.

**2. Disparate Data Management:**

Data across departments are stored separately, resulting in challenges accessing reservation details and other critical information promptly. This lack of centralized data management hinders efficiency and can lead to delays in responding to guest inquiries or requests.

**3. Lack of Maintenance Management System:**

Without a centralized system for managing maintenance tasks, the hotel faces difficulties in prioritizing and tracking repairs. This reactive approach increases the risk of prolonged downtime, impacting guest satisfaction and potentially damaging the hotel's reputation.

**4. Resource Management Challenges:**

The hotel struggles to effectively allocate resources, compounded by the sole reliance on front desk agents to convert leads into customers. This reliance increases the risk of missed opportunities and inconsistencies in customer interactions. Additionally, siloed data management practices hinder the tracking of key performance indicators (KPIs), making it challenging to assess the hotel's overall performance and make informed decisions for future growth and optimization.

**5. Front Desk Overload and Missed Opportunities:**

The hotel's heavy reliance on front desk agents to convert leads into customers burdens these employees with multiple responsibilities, increasing the likelihood of missed opportunities. With limited bandwidth, there's a risk of neglecting potential clients, which can hinder revenue growth and customer acquisition efforts.

**6. Reservation Details Accessibility Issues:**

The lack of readily available reservation details impedes the hotel's ability to efficiently manage bookings and respond to guest inquiries. This accessibility issue can lead to booking errors, double bookings, and delays in confirming reservations, ultimately affecting guest satisfaction and loyalty.

**7. Challenges in KPI Monitoring:**

The hotel struggles to effectively monitor key performance indicators (KPIs), such as occupancy rates, revenue per available room (RevPAR), and guest satisfaction scores. Without comprehensive tracking and analysis of these metrics, management lacks actionable insights to drive operational improvements and strategic decision-making.

**8. Data Silos Impacting Customer Engagement:**

Siloed data management practices hinder the hotel's ability to deliver personalized and seamless guest experiences. Without integrated systems for storing and accessing guest information, staff may struggle to anticipate guest preferences or address their needs proactively, resulting in missed opportunities to enhance guest satisfaction and loyalty.

## 2.2. Motivation:

Implementing a comprehensive hotel management system offers numerous benefits and opportunities for improvement, ensuring operational excellence, guest satisfaction, and sustained growth:

**1. Streamlined Operations and Enhanced Efficiency:**

A fully integrated hotel management system automates and centralizes key processes, including reservations, inventory management, and financial transactions. By eliminating manual tasks and reducing paperwork, the system streamlines operations,

increases workflow efficiency, and minimizes the risk of errors. This allows staff to focus on delivering exceptional service and optimizing guest experiences, leading to improved productivity and operational effectiveness.

**2. Real-Time Data Insights for Informed Decision-Making:**

With centralized data management capabilities, the hotel gains access to real-time insights and analytics across various operational areas. From occupancy rates and revenue trends to guest preferences and inventory levels, the system provides comprehensive data for informed decision-making. Management can identify opportunities for revenue optimization, allocate resources more effectively, and respond promptly to changing market dynamics, driving strategic growth and competitiveness.

**3. Enhanced Guest Engagement and Personalization:**

A hotel management system facilitates seamless communication and interaction with guests throughout their journey, from booking to departure. By leveraging guest profiles, preferences, and booking history, the system enables personalized service delivery, tailored promotions, and targeted marketing campaigns. This fosters stronger guest relationships, increases loyalty, and encourages repeat business, ultimately boosting revenue and brand reputation.

**4. Improved Financial Management and Cost Control:**

The system's robust financial management features, such as automated invoicing, billing, and expense tracking, ensure accuracy and transparency in financial operations. By providing real-time visibility into revenue streams, expenses, and profit margins, the system enables proactive financial planning, budgeting, and cost control measures. This enhances profitability, mitigates financial risks, and supports sustainable business growth in the long term.

**5. Scalability and Adaptability for Future Growth:**

A flexible and scalable hotel management system accommodates the evolving needs and growth aspirations of the hotel. Whether expanding operations, adding new services, or entering new markets, the system provides the agility and adaptability required to scale operations seamlessly. With modular functionality and customizable features, the system can be tailored to suit the unique requirements of the hotel, ensuring long-term relevance and success in a dynamic and competitive industry landscape.

**6. Efficient Resource Management and Optimization:**

The hotel management system facilitates efficient allocation and utilization of resources, including staff, inventory, and facilities. Through automated scheduling, task assignment, and inventory tracking functionalities, the system ensures optimal utilization of available resources, minimizing waste and maximizing productivity. This results in cost savings, improved service delivery, and enhanced guest satisfaction, ultimately contributing to the hotel's profitability and success.

**7. Comprehensive Maintenance Management for Asset Preservation:**

By integrating maintenance management functionalities, the hotel management system ensures proactive monitoring and timely maintenance of assets and facilities. Scheduled maintenance tasks, equipment inspections, and work order management functionalities help prevent equipment failures, reduce downtime, and extend the lifespan of critical assets. This proactive approach to maintenance preserves the hotel's physical assets, enhances operational reliability, and minimizes disruptions to guest experiences, ultimately contributing to long-term sustainability and cost savings.

**8. Data Security and Compliance Assurance:**

The hotel management system incorporates robust data security measures and compliance protocols to safeguard sensitive guest information, financial data, and proprietary business data. With built-in encryption, access controls, and audit trails, the system ensures data integrity, confidentiality, and regulatory compliance. By instilling trust and confidence in guests and stakeholders, the system enhances the hotel's

reputation, mitigates legal and financial risks, and fosters long-term relationships with customers and partners.

**9. Enhanced Cross-Departmental Collaboration and Communication:**

Through centralized data management and communication channels, the hotel management system facilitates seamless collaboration and communication across different departments and teams. Real-time access to shared data, task assignments, and communication tools streamlines workflows, improves coordination, and fosters a culture of teamwork and innovation. This collaborative approach enhances operational efficiency, accelerates decision-making, and drives continuous improvement and excellence across all aspects of hotel operations.

# 03.Aims and Motivations

## 3.1 Goals:

1. **Effective Reservation Administration:**

Visitors can check the availability of rooms, make reservations and get instant confirmation thanks to the systems automation of the reservation process. Employees can also use it to effectively manage reservations, distribute room inventory and create reports for forecasting and analysis.

2. **Easy procedures for checking in and checking out:**

There is an attempt to improve guest satisfaction and reduce wait times by optimizing the check-in and check-out processes. Self-service kiosks may also be used to speed up the process even more. Mobile check-in and check-out options are integrated to give guests flexibility and convenience.

3. **Handling housekeeping with effectiveness:**

In addition to tracking the status of room cleaning in real-time and expeditiously handling maintenance requests the system makes housekeeping task scheduling and assignment easier. With mobile devices or tablets housekeeping staff can easily access their schedules, update task statuses and communicate with supervisors.

4. **Improved amenities for visitors:**

Services for guests are provided in a personalized manner according to their preferences, past interactions and feedback. Employees can anticipate needs, make customized recommendations and deliver great service at every touchpoint thanks to the system capture of guest data and preferences. The guest experience can be further improved by integrating upselling opportunities, loyalty rewards and exclusive promotions.

5. **Financial Reporting and Management:**

There are extensive features for managing finances such as the ability to track revenue, track expense bills and issue invoices. To keep tabs on revenue growth and performance track spending and find areas where money can be saved the system produces comprehensive financial reports and analytics. To further streamline financial processes integration with accounting software may be put into place.

6. **Employee Education and Training:**

Through the identification of training needs, monitoring of employee performance and administration of training schedules the system supports staff training and development initiatives. Staff members can easily improve their skills and knowledge by accessing training modules, quizzes and assessments via the system. To track development and assess training efficacy performance metrics and feedback systems are also combined.

## 3.2 The systems objectives:

1. **Optimizing Processes:**

A number of operational duties including reservation management, housekeeping inventory control and guest services are intended to be automated and integrated by the hotel management system. The system decreases manual errors, minimizes duplication of effort and boosts overall efficiency by consolidating these processes onto a single platform.

2. **An improved visitor experience:**

With seamless and customized experiences throughout their visit this system is built with the needs of the customer in mind. It makes it simple for visitors to reserve rooms set personal preferences use concierge services and leave reviews—all of which help ensure a memorable and pleasurable stay.

3. **Best Use of Available Resources:**

In order to maximize profits in the hospitality sector effective resource management is essential. Based on demand forecasting occupancy trends and revenue potential the Hotel Management System optimizes the distribution of resources including rooms staff and inventory. This guarantees the effective use of resources minimizing waste and cutting down on operating expenses.

4. **Better Cooperation and Communication:**

Maintaining excellent customer service and quickly resolving issues requires seamless communication and collaboration among hotel staff members. Through task assignment tools shared calendars and messaging platforms the system enables real-time communication between staff members in various departments facilitating efficient coordination and prompt guest assistance.

5. **Making Sure Data Is Secure:**

Because guest information and financial transactions are sensitive data security is of utmost importance in the hospitality sector. To guard against unauthorized access data breaches and cyber threats the Hotel Management System employs strict security measures like encryption access controls and routine audits. In order to keep guests confidence and credibility adherence to industry standards and regulations is also guaranteed.

6. **Tracking and Organizing Performance:**

Achieving corporate goals and promoting continuous improvement require efficient performance management and monitoring. Key performance indicators (KPIs) like occupancy rates average daily rate (ADR) revenue per available room (RevPAR) and guest satisfaction scores can be monitored by managers using the systems tools and analytics dashboards. This facilitates data-driven decision-making pinpointing areas in need of development and putting focused plans into action to raise overall performance.

# 4.0 System Overview

## 4.1 User Management

**Functional Requirements**

**Account Creation:**
The Account Creation functionality within our Hotel Management System facilitates a streamlined process for users to establish personalized accounts. With an intuitive interface, users input relevant details to create their accounts, ensuring a tailored and secure experience within the system. This user-friendly feature not only enhances accessibility but also contributes to the overall satisfaction of individuals interacting with our Hotel Management System.

**User Logging:**
Our system prioritizes security through the User Logging functionality, offering users a

protected entry point. During the login process, credentials are meticulously authenticated, ensuring only authorized users gain access to the Hotel Management System. This robust mechanism not only safeguards sensitive information but also provides users with confidence in the security measures implemented within the system.

**User Role Handling:**
In the realm of security and access management, the User Role Handling functionality stands out. Designed for administrators, this feature empowers them to assign specific roles and permissions to different users based on their responsibilities within the Hotel Management System. This granular control not only enhances security but also streamlines user access, promoting an efficient and organized user management structure.

**Password Recovery:**
Addressing the common challenge of forgotten credentials, our system incorporates a Password Recovery feature. With a user-friendly and secure recovery procedure, individuals can easily regain access to their accounts. This thoughtful functionality not only reduces potential user frustrations but also contributes to the overall accessibility and usability of the Hotel Management System.

**Performance Management:**
Within our Performance Management System, we've integrated a robust reporting feature that encapsulates staff performance, leave management, and attendance tracking seamlessly. Administrators can leverage this powerful tool to generate insightful reports, gaining a comprehensive overview of staff activities. This encompasses the assessment of individual performances, efficient handling of leave requests, and accurate tracking of attendance records. The unified reporting functionality enhances decision-making by providing a consolidated view of critical data, empowering the hotel management team with the insights needed for strategic and informed actions.

## Non-Functional Requirements

**Security:**

The User Management module of our Hotel Management System places a high priority on security, especially when it comes to putting in place a strong two-step authentication procedure. Beyond the conventional username and password methods, this sophisticated authentication technique offers an additional degree of protection. Users will have to go through a two-step verification process, which usually entails sending a temporary code to their registered device and a password. This guarantees increased security against unwanted access, protecting private user information and preserving the integrity of our hotel management system. We are committed to implementing state-of-the-art security procedures for user authentication, as evidenced by our sole dependence on two-step authentication.

**Performance:**

Improving system responsiveness and efficiency is the goal of our User Management module's Performance requirement. This entails reducing latency when users interact with the system, guaranteeing rapid login procedures, and retrieving user data quickly. We strive to provide a high-performance experience, facilitating smooth user interactions inside the Hotel Management System, by utilizing effective algorithms and system design.

**Usability:**

In the User Management module of our Hotel Management System, usability is a crucial functional need to improve the overall user experience. Administrators and staff will find it easier to navigate and learn new features with the system's straightforward and user-friendly design. To make sure that users can interact with the system easily and efficiently, deliberate design features, well-defined processes, and clear and simple user prompts will be implemented. This will promote efficiency and user satisfaction.

**Scalability:**

In order to handle anticipated increases in user numbers and system complexity, scalability is a crucial functional need. The User Management module of our Hotel Management System will be built with scalability in mind, enabling it to easily

accommodate growing user counts and added features. Modular design, scalable databases, and effective resource management will all let the system expand and change to meet changing business needs.

**Reliability:**

In our hotel management system's user management module, dependability is a basic functional need. The system needs to run reliably, without unplanned outages or interruptions. This entails putting in place reliable error-handling procedures, making sure that the data is consistent, and carrying out exhaustive testing to find and fix any possible weak areas. Our hotel management system is more dependable overall because of a dependable User Management module that makes sure the system is up and running whenever users require access.

## 4.2 Maintenance and Housekeeping Management

### Functional Requirements:

**1. Maintenance Task Management:**

- Ability to create, schedule, and prioritize maintenance tasks for various areas of the hotel premises.
- Option to set recurring maintenance schedules for routine tasks such as HVAC servicing or plumbing inspections.

**2. Task Assignment:**

- Functionality to assign tasks to technicians or housekeepers based on skillset, availability, and workload.
- Capability to notify assigned personnel about task assignments and provide relevant details.

**3. Task Management:**

- Feature to pick open tasks by technicians or housekeepers as per their availability and expertise.
- Option to view task details, including descriptions, deadlines, and priority levels.

- Ability to reassign tasks that are in progress if the assigned technician takes sudden leave or becomes unavailable.
- Functionality to cancel or put tasks on hold if they are no longer required or if there are unforeseen circumstances preventing their completion.

**4. Task Escalation:**

- Mechanism to escalate tasks that are overdue or require urgent attention to higher authorities or specialized technicians.
- Capability to notify relevant stakeholders about escalated tasks and reasons for escalation.

**5. Asset Management:**

- Functionality to create, update, and delete company assets such as equipment, machinery, and fixtures.
- Ability to associate maintenance tasks with specific assets and track their maintenance history.

**6. Automated Housekeeping:**

- Automation of routine housekeeping tasks such as room cleaning, laundry collection, and public area maintenance.
- Integration with sensors or IoT devices to trigger housekeeping tasks based on occupancy or predefined schedules.

**7. Maintenance Issue Reporting:**

- Feature to report maintenance issues or defects encountered within the hotel premises.
- Capability to categorize issues based on severity, location, and type for efficient resolution.

**8. Real-Time Task Monitoring Dashboard:**

- A dashboard interface for the maintenance manager to monitor ongoing maintenance tasks in real-time.
- Provides visibility into task statuses, progress, assigned technicians, and deadlines.
- Includes graphical representations and filters for easy visualization and analysis of task data.

**9. Reports and Analytics:**

- Comprehensive reporting capabilities to generate various reports such as work order summaries, asset performance analysis, technician productivity reports, and maintenance cost analysis.
- Integration with analytics tools to perform trend analysis, identify patterns, and forecast maintenance needs based on historical data.
- Customizable dashboards for different stakeholders to access relevant reports and analytics insights.

## Non-functional Requirements:

**1. Performance:**

- The system should provide fast response times for task management, reporting, and analytics functionalities, even during peak usage hours.
- It should be able to handle a large volume of concurrent users and transactions without experiencing performance degradation.

**2. Usability:**

- The user interface should be intuitive and user-friendly, catering to the needs of both technical and non-technical staff.
- Training materials and documentation should be provided to ensure users can effectively utilize all features of the system.

**3. Security:**

- The system should implement robust authentication and authorization mechanisms to prevent unauthorized access to sensitive data.

- Data encryption should be employed to protect confidential information stored within the system.
- Regular security audits and updates should be conducted to identify and address potential vulnerabilities.

**4. Reliability:**

- The system should be highly available, with minimal downtime for maintenance or upgrades.
- Data integrity and consistency should be ensured through regular backups and data validation checks.
- Failover mechanisms should be in place to ensure continuous operation in case of system failures.

**5. Scalability:**

- The system should be designed to accommodate future growth and increasing demands for maintenance management within the hotel.
- Scalability options such as horizontal scaling should be considered to handle additional users and resources.
- Load balancing mechanisms should be implemented to distribute incoming requests evenly across server instances.

**6. Accessibility:**

- The system should be accessible to users with disabilities, complying with accessibility standards such as WCAG.
- Alternative access methods, such as keyboard shortcuts and screen reader compatibility, should be provided to accommodate diverse user needs.

## 4.3 Restaurant Management

### Functional Requirements:

**1. Menu Management:**

- Create new menu items with details such as name, description, and price.
- Update existing menu items with revised information.
- Add menu items to specific categories (appetizers, main courses, desserts, etc.).
- Delete menu items that are no longer offered.

**2. Reservation Management:**

- Create new reservations for restaurant tables.
- Update reservation details such as date, time, and number of guests.
- Cancel or delete reservations as needed.

**3. Order Management:**

- Create new orders for restaurant meals.
- Update order details including menu items, quantity, and special requests.
- Cancel orders if necessary.

**4. Inventory Management:**

- Manage restaurant inventory by adding new items, updating quantities, and descriptions.
- Track stock levels and receive notifications for low inventory.
- Remove obsolete or discontinued items from the inventory.

**5. Raw Material Request:**

- Request raw materials or ingredients from the main inventory.

- Specify quantities needed and expected delivery dates.
- Update or cancel requests based on changing requirements.

**6. Table Management:**

- Assign tables to reservations or walk-in guests.
- Update table status (occupied, reserved, available, etc.).
- Manage seating arrangements for optimal guest experience.

**7. Reporting:**

- Generate reports on fast moving items, menu performance and sales trends.
- View reservation reports including booking trends, peak hours, and cancellations.
- Inventory reports showing current stock levels, usage trends, and restocking needs.
- Generate Daily Income Report showing total revenue, broken down by categories.

**8. Customer Restaurant Portal:**

- Provide a separate, user-friendly portal for customers to access restaurant services.
- Allow customers to view favorite food choices in all categories in daily menus with details on dishes, prices, and availability.
- Enable customers to place food orders directly from the menu, specifying quantity and any special requests.
- Provide options for customers to select preferred date, time, and number of guests, see table availability, make table reservations.
- Allow customers to view their order history, including past orders and reservations.
- Send confirmation emails or notifications to customers upon successful order placement or reservation booking.

## Non-Functional Requirements:

### 1. User Interface:

- The system should have an intuitive and user-friendly interface for staff.
- Ensure consistency in design elements and navigation throughout the application.

### 2. Performance:

- The system should respond promptly to user actions, with minimal loading times.
- Handle concurrent users during peak hours without performance degradation.

### 3. Reliability:

- The system should be available 24/7 with minimal downtime for maintenance.
- Regular backups of data to prevent loss in case of system failures.

### 4. Scalability:

- Ability to scale the system to accommodate growth in menu items, reservations, and orders.
- Support for future integrations with additional modules or services.

### 5. Data Integrity:

- Ensure data accuracy and consistency across all modules.
- Implement validation checks for menu items, reservations, and inventory updates.

**6. Scalability for Traffic Peaks:**

- Design the portal to handle high traffic volumes during peak dining hours or special events.
- Implement load balancing techniques to distribute server load and ensure consistent performance.

**7. Mobile Responsiveness:**

- Optimize the customer portal for mobile devices, including smartphones and tablets.
- Ensure responsive design elements for easy viewing and interaction on smaller screens.

## 4.4 Inventory Management System

**Functional Requirements**

**1. Supplier management -** Supplier managers should be able to create new suppliers by providing details as name, description, contact details & company details. Supplier managers can maintain & update the supplier details.

**2. Inventory management -** the system should be able to Continuously update inventory levels in available stock. And the inventory manager can generate a report.

**3. Return & Exchange -** Some items need to return to suppliers or exchanged due to various reasons. The manager can return or exchange that items & update the inventory levels.

**4. Order placement -** Once an item reaches its reorder level, the system generates a purchase order automatically or prompts a staff member to create one manually. The purchase order includes details such as the item name, quantity, preferred supplier, price, and delivery instructions.

**Non-functional Requirements**

- **Security -**

The inventory and supplier management module of our system places a high priority on security for the Data confidentiality of the sensitive information such as supplier details, pricing and inventory levels. The authentication mechanism verifies the identity of users entering the system. This may include authenticating the username and password provided to the user.

- **Usability -**

The usability of a hotel management system's inventory and supply management system refers to how easily and efficiently users, such as hotel staff members, can interact with the system to perform tasks related to managing inventory and suppliers. Our system features a user-friendly interface with clear navigation menus, intuitive icons and well-organized layouts. This ensures that users can quickly find the functions they need without extensive training.

- **Accessibility -**

The Accessibility of the inventory & supplier management system, the user can ensure all functionality can be accessed and operated using a keyboard. Provide a keyboard shortcuts for common actions. Ensure sufficient color contrast for text and interactive elements to improve visibility.

- **Maintainability -**

In the inventory management system can be maintained, updated, and extended over time. It involves factors such as modular design, clean code practices, comprehensive documentation and version control.

## 4.5 Finance Management System

A finance management system is one of the key segments of a company because all the company's profitability & the revenue which the company earns will be decided by the finance management system. So, developing a high-end finance management system is one of the crucial things for a company. The reports which will be generated in the month end give a brief idea about the company's financial status & Analyzing the reports we can predict the future financial status of the company & make arrangements to improve the company's state within the competition. So using a high end functioning finance management system, we can do miracles in a company.

**Functional Requirements**

- Manage Customer Payments
- Request Refund
- Manage Salary Remittances for the Staff
- Create Outbound payments
- Make utility Payments
- Generate monthly reports

## 1. Manage Customer Payments

### Self-Checkout System – Done by the Customers

The customer is the main user of our system. Therefore, we have to give the full customer service as well as the best user experience through our system. So, customer satisfaction is one of the key things that we focus on in our system. For the customers we have made it easy to manage their payments through our payment portal. The special feature called **Self-Checkout** option gives the customer the full access to checkout from the hotel within a few seconds & within fingertips reach all by his own.

### Manual Checkout System – Done through Staff

The other type of the customer payments is the over the counter payments. We develop another portal for the staff members to manually checkout the customer from the hotel. The customer will be able to perform their payments through debit card, credit card as well as with cash. So, the counter staff is only given the access for this payment method & the system will be user-friendly for the hotel staff to perform their transactions as well

For the above mentioned 2 methods we are using a 3rd party payment gateway to validate & verify the payments which the customer is going to perform over the counter as well as for the self-checkout as well. Therefore, our system will be a very secure system for the users.

## 2. Manage Refund Request

In our system If a customer has made an invalid payment in the system, customers can request for a refund. There the request will be handled by the finance assistant & the necessary approvals will be taken from the management & the mentioned amount will

be refunded to the customer within a few days. We deliver the best customer service from these new feathers we have added to the system.

### 3. Manage Salary remittances

The Salaries of the staff will be handled by the finance assistant of the management. From the user management we are getting the detailed report of the staff members & their performance as well as the attendance for the specific months. After analyzing those reports the salaries will be calculated including the OT hours as well. The calculated salaries will be forwarded to the finance manager for the approvals & with the approval of the finance manager the salaries will be credited accordingly. The finance manager can reject any salary application if there are any errors of the calculations & the same can be edited & resubmitted by the finance Assistant

### 4. Create Outbound payments

The finance Assistant is the person who is in charge of all the outbound payments. Most of these payments are supplier payments for the goods we receive & the maintenance fees which we have to pay for the maintenance as well. Not only that the government taxes also will be applicable for the outbound payment section as well. The finance assistant will fill the form which is available in the payment section and all the details of the payment will be recorded accordingly & submitted for the approvals of the finance manager. With the approval of the finance manager the payment will be done for the credit party accordingly.

### 5. Make utility payments

Making utility payments is another outbound payment which will also be looked after by the finance assistant. The monthly water, electricity bills & monthly rent etc. will be submitted to the finance assistant by the maintenance team & the payments for the utility bills will be created forwarded for the approvals of the finance Manager & the

same will be approved by the finance manager & the payments will be done for the government

**6. Generate month end reports**

At the end of the month we analyze the financial status of the company so the reports which we generate will be the key for our success. So, the reports which we generate should be much more accurate & updated as well. With the use of those reports we will be doing a brief analysis about the revenue & the profitability of each product which we offer the customers & the expenses we make within the month as well. The finance assistant will be uploading those reports to the system for the higher management to refer & the top management will be planning & applying the modern strategies to improve the financial status of the company in the future. So, the company relies on these reports & the same should be very accurate as well.

**Non-Functional Requirements**

**1. 24/7 Service**

Our payment portal will be functioning 24/7 for the customers to make payments including the **self-checkout** method as well. Apart from that the customers can manually checkout as well at any time in the day. Not only that but also our **Request for Refund** function also will be available for the customers 24/7 as well. We deliver the best customer service in our Hotel.

**2. Performance**

In the Finance management system, we deliver the best performance related system for the customers. The system can handle a large number of customers at the same time. We make the performance of the system better that way the customers don't get any

slowness or lagging in the system. We make sure the system functions smoothly as much possible

### 3. Scalability

If the company is going to expand in the future we make sure all the functions we have included will be functioning in the very best of their form. We make sure that the system will not be crashing in a situation where we deal with a heavy workload. We make sure the system will be able to handle a heavy load of data users , transactions & the data volume.

### 4. Security

Sensitive data such as card details, Salary details, transaction details & customer details will be encrypted & 3rd parties will not be able to reach those data. The backend system of financial management will only be accessible by the Finance Assistant & the Finance manager & we make sure that the other staff members & the people outside the organization will not reach the sensitive data in any way.

### 5. Reliability

The system we develop will be a reliable system. The reports which we generate in the month end will be very accurate & customers will not be facing any errors when they are processing their payments & if any system failure occurs our maintenance team will be handling the errors within a short period of time

## 4.6 Feedback and Marketing Management

**Functional Requirements**

**1. Provide Feedback:**

Users should be able to submit feedback easily through the system, including ratings, comments, and suggestions.

**2. Feedback Analysis:**

system must be capable of analyzing the feedback received, categorizing it, and generating reports to identify trends, strengths, weaknesses, and areas for improvement.

**3. Create Campaigns:**

Users should be able to create new marketing campaigns within the system, specifying details such as target audience, messaging, duration, and channels.

**4. Update Performance**:

The system needs to track the performance of marketing campaigns, collecting data on metrics like click-through rates, conversion rates, and return on investment (ROI), and allow for adjustments based on performance analysis.

**5. Assign Team Members to Tasks:**

Users should be able to assign specific tasks related to marketing campaigns or feedback management to team members within the system, with clear deadlines and responsibilities.

**6. Loyalty Programme Management:**

The system should support the management of loyalty programs, including the ability to enroll guests, reward points, and redeem rewards.

**7. Create Promotion Codes:**

Users should have the capability to generate promotion codes within the system, specifying details such as discount percentage, validity period, and usage limits.

**Non Functional Requirements**

**1. Performance:** The system should be able to handle a large volume of feedback submissions and marketing data efficiently, ensuring fast response times and minimal latency.

**2.Scalability:** The system should be designed to scale easily to accommodate increasing numbers of users, feedback submissions, and marketing campaigns without compromising performance.

**3.Reliability:** The system must be reliable, with minimal downtime and the ability to recover quickly from failures to ensure uninterrupted service for users.

**5.Usability**: The system should have an intuitive user interface, making it easy for hotel staff to submit feedback, analyze data, manage marketing campaigns, and administer loyalty programs without extensive training.

**6.Compatibility:** The system should be compatible with a variety of devices and platforms, ensuring seamless access for users regardless of their preferred device or operating system.

**7.Maintainability:** The system should be designed with clean, modular code and well-documented processes to facilitate ease of maintenance, updates, and future enhancements.

**8.Compliance**: The system must comply with relevant industry regulations and standards for data privacy, security, and marketing practices

## 4.7 Transport Management

**Transport management.**

Our integrated transport management system streamlines guest transportation, ensuring seamless coordination of arrivals, departures, and local excursions. From airport transfers to city tours, our system optimizes routes, schedules, and vehicle allocation, enhancing guest experience with efficient and reliable transportation services**.**

**Functional requirements**

- **Destination Search**

This functional requirement enables customers to efficiently locate transportation options for their desired destinations within the transport management system. It encompasses a user-friendly interface where customers can input destination queries, robust search functionality generating real-time results, and filtering options to refine search results based on preferences like price and transportation mode. The system must also display the availability status of transportation services for selected destinations and seamlessly integrate with booking features, payment processing, and customer profiles. Ultimately, this functionality empowers customers to make informed decisions and facilitates a streamlined booking process within the transport management system.

- **Book shuttle services**

This functional requirement allows customers to reserve seats on shuttle services via the transport management system. It encompasses a user-friendly interface where customers can select their preferred departure times and view real-time availability of seats. Customers can choose specific seats based on availability and personal preference, with the system facilitating secure payment processing for bookings. Upon confirmation, customers receive a booking confirmation and can manage their reservations, including making changes or cancellations if needed. This functionality seamlessly integrates with other system components, ensuring a cohesive and efficient booking experience for customers within the transport management system.

- **Book Cab Services**

The above functional requirement enables customers to efficiently reserve cab services through the transport management system. It provides customers with a user-friendly interface where they can input their destination and select their preferred cab type and pickup time. The system displays available cab options, including details such as vehicle type, available packages, and driver information. Customers can confirm their booking, with the system facilitating secure payment processing for the ride. Upon confirmation, customers receive booking details and can track the status of their cab in real-time. This functionality seamlessly integrates with other system components, ensuring a smooth and convenient booking experience for customers within the transport management system.

- **Report Generation**

The "Report Generation" functional requirement involves the system's ability to generate various reports related to transportation operations, finances, and customer bookings within the transport management system. This functionality enables users, particularly staff and transport managers, to extract valuable insights and make informed decisions. Users can specify parameters such as date ranges, destination metrics, or financial data to customize the reports according to their needs. The system generates these reports in a structured format, presenting key information such as transportation performance metrics, revenue summaries, or customer booking trends. Users can easily access, view, and export these reports for further analysis or sharing with relevant stakeholders. Overall, the report generation functionality enhances decision-making processes and facilitates efficient management of transportation services within the transport management system.

- **Adding/Editing/Deleting vehicles**

This functional requirement involves providing users, particularly staff and transport managers, with the capability to manage the fleet of vehicles within the transport management system. This functionality allows users to add new vehicles to the system, update existing vehicle information, and remove vehicles that are no longer in service. When adding a new vehicle, users can input details such as vehicle type, registration information, capacity, and maintenance schedule. For editing vehicles, users can modify

any relevant information such as updating registration details or changing maintenance schedules. Additionally, users have the ability to delete vehicles from the system, removing them from the available fleet. This functionality ensures that the vehicle inventory remains accurate and up-to-date, facilitating efficient management of transportation services within the transport management system.

- **Adding / Editing/ Deleting Route**

This functional requirement enables users, particularly staff and transport managers, to manage transportation routes within the transport management system. This functionality allows users to add new routes, modify existing routes, and delete routes as needed. When adding a new route, users can input details such as starting and ending points, distance, estimated travel time, and any relevant notes or restrictions. For editing routes, users can update any of the route details, such as changing distances, or updating travel times. Additionally, users can delete routes from the system, removing them from the available options for transportation. This functionality ensures that the system maintains an accurate and up-to-date database of routes, facilitating efficient route planning and management within the transport management system.

**Nonfunctional Requirements**

**1.Security**

- Ensure data security and privacy of user information.
- Secure payment processing for cab bookings.

**2.Reliability**

- High availability to ensure customers can book transportation services anytime.
- Reliable tracking of shuttle and cab services.

**3.Scalability**

- Ability to handle increasing numbers of users and bookings without performance degradation.

**4.Usability**

- Intuitive user interface for easy navigation and booking.
- Support for multiple languages and accessibility options.

**5.Performance**

- Fast response times for search queries and booking transactions.
- Minimal downtime for system maintenance.

## 4.8 Guest and Reservation Management

**Functional Requirements**

**Manage Room Reservation:**

This factor of the system lets in customers to carry out CRUD operations on room reservations. customers ought to be capable of create new reservations, view present reservations, update reservation information, and cancel reservations as wanted. The device ought to additionally consist of features for checking room availability, coping with reserving conflicts, and managing unique requests or possibilities from guests.

**Guest Information Handling:**

This module integrates various aspects of guest data, consisting of travel details, eating place choices, and comments. It ought to permit customers to keep and retrieve guest profiles, consisting of non-public data, travel itineraries, dining choices, and any comments provided by way of guests for the duration of or after their stay. Integration with external systems can be essential to synchronize travel data and eating place reservations.

**Generate Guest Report:**

this option allows customers to generate reviews summarizing visitor information. reviews can also include information inclusive of visitor demographics, reserving history, possibilities, comments, and another relevant data. these reviews may be useful for studying visitor developments, improving carrier offerings, and personalizing visitor reviews.

**Generate Reservation Report:**

This functionality enables users to generate reports in particular associated with room reservations. reports may also consist of information which include occupancy rates, booking traits, sales evaluation, and reservation reputation. these reports can help lodge control make informed decisions concerning pricing, stock control, and useful resource allocation.

**Nonfunctional Requirements**

**Performance:**

The system must be capable of cope with a large quantity of reservations and visitor facts efficiently without substantial delays or performance degradation. response

instances for common operations along with room reservation and visitor profile retrieval must be saved to a minimal to ensure a clean person revel in.

**Reliability:**

The system should be fantastically reliable, ensuring that each one guest reservations and facts are correctly recorded and securely saved. It should include mechanisms for facts backup and healing to save you lack of critical facts in case of machine screw ups or mistakes.

**Security:**

security features should be implemented to protect guest information from unauthorized get entry to, manipulation, or disclosure. This consists of imposing get entry to controls, encryption protocols, and secure authentication mechanisms to guard sensitive statistics stored within the system.

**Usability:**

The system needs to be user-friendly and intuitive, permitting inn staff to without difficulty navigate via specific functionalities and carry out responsibilities without massive schooling or steering. clean interfaces, logical workflows, and useful activates need to be included to enhance usability and decrease person mistakes.

**Availability:**

The system needs to be to be had and reachable to customers each time needed, without any giant downtime or interruptions in provider. Redundancy measures, failover mechanisms, and proactive tracking need to be in place to ensure non-stop operation and minimize disruptions to hotel operations.

## 5.0 Literature Review

This hotel management system is a comprehensive software solution designed to automate various facets of hotel operations, encompassing reservation management, front desk operations, housekeeping, point of sale, accounting, guest management, reporting, and security. Its key features, including efficient reservation management, smooth front desk operations, coordinated maintenance and housekeeping management, streamlined point of sale transactions, accurate accounting and billing, personalized guest management, and insightful reporting and analytics, collectively contribute to operational efficiency, enhanced guest satisfaction, and increased revenue potential within the hospitality industry.

In the realm of hotel management systems, several existing solutions offer a diverse range of features tailored to address various aspects of hotel operations. Opera PMS [1] (Property Management System) stands out as a prominent system, showcasing its own set of merits and limitations. Notable strengths of Opera PMS include its comprehensive suite covering reservations, check-in/out, billing, and housekeeping, seamless integration with other systems for accounting, CRM, and revenue management, and robust reporting and analytics capabilities. However, its complexity and costliness, particularly for smaller establishments, alongside limited customization options pose challenges, necessitating additional development for specific requirements.

Similarly, Fidelio Suite8 [2] presents its own array of features and drawbacks. Noteworthy strengths include its established reputation in the industry, offering modules for front office, reservations, housekeeping, and point of sale, and seamless integration with third-party systems for enhanced functionalities. Nevertheless, concerns regarding its outdated user interface, lack of intuitiveness compared to newer systems, and limited scalability for larger hotel chains or properties with intricate requirements emerge as notable drawbacks.

In addition to Opera PMS and Fidelio Suite8, Cloudbeds [3] emerges as a cloud-based solution offering notable advantages and disadvantages. Its strengths lie in its cloud-based architecture, providing flexibility and accessibility from any location, user-friendly interface suitable for small to mid-sized properties, and seamless integration with various channels for online bookings and distribution. Conversely, limitations such as the absence of advanced features required by larger establishments and restricted customization options compared to enterprise-level solutions are notable shortcomings.

In conclusion, while existing hotel management systems offer an array of features and functionalities, they may not comprehensively address the unique needs and requirements of every client. These systems often exhibit limitations in terms of customization, scalability, and cost-effectiveness, underscoring the need for tailored solutions. For clients seeking to integrate a comprehensive transport management system within their existing hotel management framework, existing solutions may fall short in providing the requisite functionalities for seamless integration and efficient transportation service management. Thus, the development of a custom-built system tailored to the client's specific needs emerges as the most effective solution. This bespoke system can be meticulously designed to seamlessly integrate with the client's existing hotel management infrastructure, while offering the requisite flexibility, scalability, and functionality to efficiently manage transportation services and elevate the overall guest experience.

# 6.0 Methodology

### 6.1 Requirements Engineering

1. **Elicitation:**

Our team used group brainstorming sessions and internal conversations to get knowledge throughout the Hotel Management System's elicitation phase. We relied on the team members' aggregate experience to discover prospective features and needs instead of conducting formal interviews. In order to comprehend industry best practices, more insights were obtained by researching online and examining currently in use hotel management systems. With the use of this method, we were able to model situations involving guests, managers, and hotel employees, which laid the groundwork for gathering a thorough list of needs.

2. **Analysis:**

During the analysis stage, we looked closely at the data that we had collected via web research, internal conversations, and references to current systems. Our main goal was to make sure that everyone understood all of the standards set out by the Hotel Management System. We refined the data acquired through teamwork and other sources, identifying and resolving any possible conflicts, ambiguities, or discrepancies. The foundation for a strong and organized hotel management system was laid by prioritizing features based on information from other systems.

## 3. Specification:

During the specification phase, the improved requirements had to be organized and documented. Based on information gleaned from internal talks and investigation of current systems, functional needs, including procedures for reserving rooms, reservation administration, invoicing features, and reporting mechanisms, were outlined. Non-functional criteria, which encompassed elements like usability, security, and performance, were clearly delineated, integrating industry norms and online best practices. This documentation, which was based on the experience of our team and outside sources, functioned as an extensive manual for the next phases of development.

## 4. Validation:

Our team gave the defined criteria a close examination throughout the crucial validation step. In order to ensure that the criteria were in line with the expectations and operational needs of the fictitious stakeholders, feedback was aggressively sought. Through this iterative approach, team members were able to establish a shared understanding and ensure that any inconsistencies or misconceptions were swiftly resolved. By utilizing both external research and the combined experience of our internal team, the validation phase was essential to ensuring that the Hotel Management System accomplished the desired objectives and reducing the possibility of misalignment.

## 5. Management:

During the management phase, team members collaborate by getting together to talk about new ideas and possible modifications for the Hotel Management System. Our team evaluates changes iteratively to make sure it stays in line with the project objectives. Consistent updates to the documentation mirror authorized modifications, offering a trustworthy point of reference for the continuous advancement. Efficient management, founded on cooperative dialogues, is essential to upholding project integrity and fulfilling changing demands.

### 6.2 Design Methodology

For our project, we will adopt a design methodology that emphasizes the use of UML tools and techniques. Each team member will work on segmented tasks independently, producing models and drawings using Draw.io [4]. This approach ensures a structured and organized design process, facilitating collaboration and coherence within the project.

### 6.3 Developing Tools & Technology

In our MERN [5] stack development, we'll employ a comprehensive suite of tools and technologies to craft a robust hotel management system. JavaScript will serve as our primary language, with Node.js [6] providing the runtime environment for server-side execution. Express.js [7] will facilitate backend development, enabling us to create efficient APIs and manage server-side logic seamlessly.

For data storage and management, MongoDB [8] will be our database of choice, offering flexibility and scalability to accommodate the diverse needs of our hotel management system. MongoDB's document-oriented database model aligns perfectly with the dynamic nature of our data, allowing for easy adaptation and optimization.

On the frontend, we'll harness the power of React.js [9], a highly efficient JavaScript library renowned for its component-based architecture and virtual DOM rendering. React's modular approach will enable us to build interactive and responsive user interfaces, enhancing the overall user experience of our system.

To ensure collaborative development and version control, we'll utilize Git [10], enabling our team to work seamlessly across various aspects of the project while managing code changes efficiently.

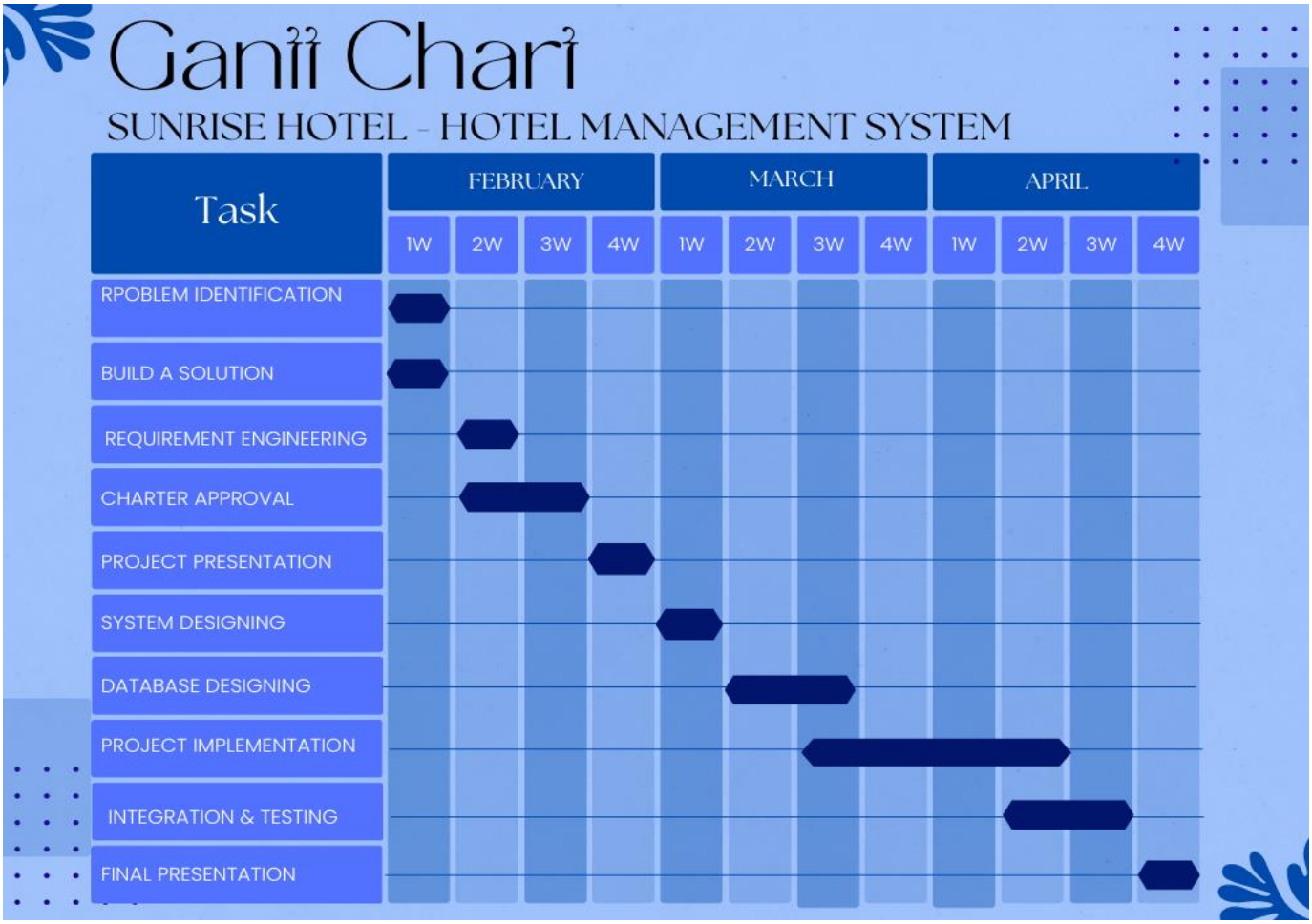
By leveraging these technologies, we aim to deliver a cutting-edge hotel management system that meets the evolving needs of our clients and users, offering a seamless and intuitive experience.

### 6.4 Testing Methodology:

In our Hotel Management System project, we are implementing various testing methodologies to ensure the robustness of the system, including both black box testing [11] and white box testing [12]. Black box testing involves the analysis of the application's functionality without detailed knowledge of its internal design. This approach allows us to evaluate the system's performance based on its expected outputs for different inputs. On the other hand, white box testing focuses on the internal coding and structure of the system, verifying the data flow from input to output. To facilitate our testing efforts, we will leverage tools like Postman to thoroughly assess the backend of the system.

Furthermore, our testing strategy includes unit testing and integration testing. Each team member will conduct unit testing [13] for specific functions using tools like Postman [14] to ensure individual components function as intended. Upon successful completion of unit testing, team members will collaborate to integrate these functions and perform comprehensive integration testing. This dual-layered testing approach aims to validate both individual functionalities and the seamless collaboration of integrated components within our Hotel Management System.

### 6.5 Gantt Chart



**6.6 Work Breakdown Chart**

| Name with Initials (Surname first) | Registration Number | Work Allocated |
|---|---|---|
| M P S S Sewwandi | IT22304810 | User Management |
| M N Dikkumbura | IT22000644 | Maintenance and Housekeeping Management |
| W D R Pradeepa | IT22033482 | Restaurant Management |
| P A J Kavindu | IT22269034 | Inventory and Supplier Management |
| M M Sandeep | IT22221100 | Financial Management |
| P D D Dananjana | IT22146274 | Feedback and Marketing Management |
| K.A.N.N.S.Kumari | IT22317612 | Transport Management |
| D S I Chathuranga | IT22069054 | Guest and Reservation Management |

## 07. Evaluation method

Hotel management systems are essential for ensuring that these systems meet the needs of both the hotel staff and guests. A hotel management system designed to streamline operations, enhance guest experiences, and optimize overall efficiency within the hospitality industry. Also, our system aims to ensure the security of sensitive data and files of the company by introducing different types of security methods. Monitoring the employees helps to track their work and having a proper understanding about their tasks. This system can be used to calculate employee performance and use them to provide different functions. Furthermore, our system has a very user-friendly

interface which provides better user experience for users and also fulfills their needs as well.

Evaluating this system involves considering various scenarios to ensure it meets the needs of the hotel staff and guests effectively. Here are some scenarios to evaluate.

- If a user wants to make a reservation for a room, User can check how quickly and efficiently the system processes the reservation, including availability, pricing, and confirmation.
- In using this system hotel managers can check how efficiently the system assigns and tracks housekeeping tasks, communicates with staff, and updates room status.
- The system should be able to assess the accuracy and speed of the billing process, including itemized charges, payment options, and invoice generation.
- The system should be able to check the track's inventory levels, generate purchase orders, and update inventory records in real-time.
- The system should be able to ensure the security of sensitive data and files of the company by using different types of security methods.
- Provides a very user-friendly interface which provides a better user experience.

## 08. References

We have used the following websites as well as the books as references for the development of our project of Hotel Management System.These sources serve as pillars of knowledge, guiding the development and implementation of our project objectives

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