SOFTWARE REQUIREMENT SPECIFICATION for
HOTEL MANAGEMENT SYSTEM

Authors:
1. Mohit Rajendra Mahajan
2. Parth Kishorebhai Mandaviya

Institute: Government Engineering College, Modasa
Department: Computer Engineering
Date:
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1. Introduction:

i. Purpose of this Document:

General purpose of this document is to specify the Hotel Management System (HMS) in detail, with it's functional and non-functional requirements. At the end the project developers are going to implement the following mentioned requirement of the project (mentioned in this document).

ii. Scope of this Document:

The scope of this document is to provide to essential and detailed information about the project to the reader. It will discus over the chef specification, vehicles parking preference, room service for the guests, table and menu specification for the guest,
providing special medical facilities.

iii. Overview:

There are already numerous Hotel Management System available but as we observe there are some problems on which we are not paying attention so we are getting those point in consideration and working on it to develop the current Hotel Management Systems.

2. General description:

In today's fast-paced hospitality industry, effective management of hotel operations is crucial to ensure a seamless and satisfying experience for guests. The Hotel Management System (HMS) project is designed to address the various challenges faced by hotel owners, managers, and staff in managing their day-to-day operations efficiency and providing top-notch services to guests.

i. Key Features: -

- We specify the live parking system for our guests to ensure their vehicle's parking in the parking space (provided by the Hotel).
- In our project they get a unique facility for their food or meal as they can choose their meal's chief for their particular dish.
- We also provide an option to the guest to book the specified room services as their needs.

ii. Project Function: -

a) Live Parking
b) Hotel room booking (with specified staff)
c) Hotel menu
d) Table booking
e) Chief assigning

f) Payment processing
g) Special offers
h) Multi-language and currency support
i) Guest review and rating
j) Report and analytics
k) Customer support and chat
l) Social media integration
m) Weather and local information
n) Security and compliance (the act of obeying a law or rule)
o) Feedback and surveys
p) Check-in and check-out

iii. Benefits to the users: -

- They are not supposed to wait for their meals due to our menu option. In this option they can order their meal before they reach the hotel or they report their reaching time according to guest's schedule and hotel will arrange their meal by that time for them.
- The live parking system will give all information about the parking space of the hotel so the guest will prefer the hotel if there is the space available for the parking, this will avoid the unnecessary chaos in the parking space.
- The hotel room booking with the new function as specific staff will help the guests to make their more comfortable as they want.
  For example: Your grandmother in the new town and you want some experienced and skilled staff should be serving her. So here she will be more comfortable with the lady staff as compare to the male staff so you can make choice for this facility in our project.
- The most important benefit is the meal's chief specification and this will increase the comfort level of the guest to the next level.
- In our project we are targeting the guest's comfort and time. With this we also ensure our user should get best using experience with Hotel Management System.

3. Function Requirements:

R.1: User Authentication	
Description	User registration and login for guests, staff and administrators.
R.1.1: Sign-in and registration	
Input	Users are supposed to enter Username, phone, e-mail, password, any gov. id etc.
Output	User gets a new page pop up for login procedure.
R.1.2: Login	
Input	User are supposed to enter the username and password to login the site.
Output	User will enter the main page of the site where they get menu, booking, profile etc.

R.2: Booking and Reservation	
Description	User's room booking and availability status. Selection of room types, dates, and guests. Live tracking of parking for getting the live update of the parking areas.
R.2.1: Room Booking	
Input	User select the room type, floor, services, date of reservation, no of guests, contact details etc.
Output	System will show the no of rooms occupied and not occupied according to user choice.
R.2.2: Parking Booking	
Input	User enter their Vehicle details and parking position.
Output	System will show how many parking slots are available and book the user's choice slot.
R.2.3: Table Reservation	
Input	User enter the no of guests, user's meal, name for the reservation, table no, contact etc.
Output	System will show the available tables, menu, show offers, assigned table no (if random), user's meal (when user arrived).

R.3: Room Checking details	
Description	Online check-in and check-out for users with payment processing
R3.1: Room check-in	
Input	User enter the room details, and opt send to the user for verification.
Output	System will verify the user's otp and then note the check-in time in the database.
R.3.2: Room Check-out	
Input	User enter just chose the check-out option given to the page.
Output	System will note the time of check-out and then room service will verify the room by offline visit.
R.3.3: Room billing	
Input	When User is booking room and other services then user will get the pop-up for payment procedure, where the user will go for UPI, debit card, credit card, gift card (if available) etc.
Output	User will receive the bill of the payment and the system will register the entry of the user detail about the reservation in the database.

R.4: Weather and local information	
Description	System will provide the weather forecasts and local attractions/event information for the tourists and guests to visit the hotel for getting rest.
R.4.1: Local weather report	
Input	User enter the current city or arrival time in the city.
Output	System will analysis the weather around user and show the best time to visit the hotel.
R.4.2: Local area information	
Input	User enter the current city or the purpose of visit (so the system will suggest best places to visit).
Output	System will show the best places and time to visit the spots according to your needs.

R.5: Social Media Integration	
Description	System has a option to integrate the social media account with the user's id.
R.5.1: Social marketing	
Input	User will enter the account's username and the platform where's it is available.
Output	System will share their experience about the staying on hotel's social media accounts with the user's permission. User are also allowed to post details about the hotel and their experiences about the stay.

R.6: Gift cards and vouchers	
Description	System will show this option whenever the user is purchasing something.
R.6.1: Apply the gift cards while payment or billing	
Input	While the payment or billing in procedure then user can choose the offer.
Output	System will apply the gift card and show the reduced amount and proceed for the payment.

R.7: Notifications and alert	
Description	System will send Notification to the guests regarding gift cards, offers, checking updates, check-in and check-out remainders, reservation updates etc.
R.7.1: Notifications	
Output	System will provide the soft copy of the Bills, Gift cards, offers, checking updates, etc.
R.7.2: Alerts	
Output	Check-in and check-out remainders, reservation details (if full) etc.

R.8: Review and Rating	
Description	System will take the users review after the check-out procedure and note the review for further updates in system.
R.8.1: Rating and Review	
Input	User enter the name and their experience about the stay in the hotel.
Output	System will encourage guests to visit the hotel again.

4. Interface Requirements:

i. User Interface:

a) Login/Registration:

- User-friendly login and registration form.
- Password reset and recovery options.

b) Dashboard:

- Intuitive and visually appealing dashboard for administrators.
- Display of relevant information such as occupancy rates, revenue, and pending tasks.

c) Room management:
- Interface for adding, editing, or deleting rooms.
- Room status indicators (clean, occupied, available) with color coding.
- Detailed room information with photos and amenities.

d) Check-in/Check-out Interface:
- Streamlined check-in and check-out processes.
- Options to add guest details, ID verification, and payment processing.
- Electronic signature capture for check-in.

e) Payment Interface:
- Secure payment gateway integration.
- Options for entering credit card details or choosing other payment methods.
- Clear billing breakdown and invoice generation.

f) Guest Services Interface:
- Easy-to-use interface for ordering additional services (room service, housekeeping, etc.).

g) Reservation Management Interface:
- Interface for modifying or canceling reservations.
- Access to reservation history and details.

h) Admin Control Panel:
- Admin panel with menus and options for managing users, rooms, staff, and reports.

i) Reporting and Analytics:
- Interface for generating reports and visualizing analytics data.

ii. Hardware Interfaces:
- Ensure compatibility with various hardware devices, including desktop computers, laptops, tablets, and smartphones.
- Integration with card readers and electronic signature capture devices for check-in and payment processing.

iii. Software Interfaces:
- Integration with third-party software and services, such as payment gateways, property management systems, and channel managers.

iv. Communication Interfaces:
- Ensure that the system can communicate with external systems through APIs or web services.
- Support for email notifications and alerts to users and administrators.

v. Accessibility Interfaces:
- Implement accessibility features for users with disabilities, including screen readers, keyboard navigation, and text-to-speech functionality.

vi. Internationalization and Localization:
- Support multiple languages and currencies to cater to international guests.
- Implement date and time formats, numbering systems, and cultural considerations based on the user's location.

vii. Security Interfaces:
- Implement secure authentication and authorization mechanisms.
- Integration with security protocols and encryption standards to protect user data.

viii. Social Media Integration:
- Social media sharing buttons and interfaces for guests to share their experiences.

ix. API Documentation:
- Provide clear documentation for any APIs that the HMS offers for third-party integration.

5. Performance requirement:

i. Response Time:
- The system should respond to user interactions (e.g., booking, room status updates) within a specified time frame, such as:
- 95% of requests must be processed within 2 seconds.
- Check-in and check-out operations should complete in under 5 minutes.

ii. System Availability:
- The HMS should be available 24/7, with minimal downtime for maintenance or upgrades.
- Define an acceptable uptime percentage (e.g., 99.9% availability) for the system.

iii. Scalability:
- The system should be able to handle increased load during peak booking periods (e.g., holidays).
- Define how many concurrent users or transactions the system should support without performance degradation.
- Implement load balancing and auto-scaling mechanisms to distribute traffic efficiently.

iv. Resource Utilization:
- Monitor and optimize CPU, memory, and storage utilization to ensure efficient resource management.
- Set limits on resource usage to prevent resource exhaustion.

v. Database Performance:
- Database queries, especially those related to room availability and pricing, should execute quickly.
- Implement database indexing and caching mechanisms for faster data retrieval.
- Define acceptable database response times for various operations (e.g., room search, reservation retrieval).

vi. Network Performance:
- Ensure fast and reliable communication between the HMS and external systems (e.g., payment gateways, third-party integrations).
- Define acceptable network latency and bandwidth requirements.

vii. Load Testing:
- Conduct load testing to simulate high levels of concurrent user activity.
- Identify performance bottlenecks and optimize system components accordingly.
- Define load testing scenarios, such as peak booking periods or simultaneous check-ins/check-outs.

viii. Security Performance:
- Ensure that security measures (e.g., encryption, authentication) do not significantly impact system performance.
- Regularly assess the system's ability to withstand security threats without degrading performance.

ix. Reporting Performance:
- Reports and analytics should generate within an acceptable time frame, even for extensive datasets.
- Specify maximum report generation times for different report types.

x. Third-Party Integrations:
- External services and APIs should respond promptly to requests from the HMS.
- Define acceptable response times for third-party integrations.

xi. Caching and Content Delivery:
- Utilize caching mechanisms to reduce server load and accelerate content delivery.
- Implement Content Delivery Networks (CDNs) for static assets to improve load times.

xii. Error Handling and Logging:
- Efficiently handle errors and exceptions without causing system slowdowns.
- Log performance-related data for monitoring and troubleshooting.

xiii. Mobile Responsiveness:
- Ensure that mobile interfaces are responsive and provide acceptable load times on mobile devices.

xiv. Compliance with Industry Standards:
- Adhere to industry standards and best practices for performance optimization.

xv. Regular Performance Testing and Monitoring:
- Establish a schedule for ongoing performance testing and monitoring to identify and address performance issues proactively.

xvi. User Experience:
- Measure and optimize user experience by considering factors like page load times and responsiveness.

6. Design Constraints:

i. Technology Constraints:
- Legacy Systems: Integration with existing legacy systems may impose constraints on the choice of technology and architecture.
- Platform: The HMS may need to be developed for specific platforms or operating systems (e.g., Windows, iOS, Android).

ii. Budget constraints:
- Cost Limitations: There may be budget limitations that affect the choice of technologies, hardware, and software licenses.
- Resource Availability: Constraints on the availability of financial and human resources can impact system development.

iii. Localization and Globalization Constraints:
- Multilingual Support: The system may need to support multiple languages and currencies, which can affect user interface design and database structure.
- Cultural Considerations: Cultural differences in user behavior and expectations may influence the system's design and features.

iv. Security Constraints:
- Security Policies: Compliance with the hotel's security policies and standards, which may affect system design and access control.

v. Data Constraints:
- Data Volume: Constraints related to the volume of data to be stored and processed, which can affect database design and storage solutions.

vi. Backup and Recovery Constraints:
- Backup Policies: Constraints related to data backup and disaster recovery procedures.

7. Non-Functional Attributes:

i. Performance:
- Response Time: The system should respond to user interactions quickly, with defined maximum response times for various operations (e.g., room booking, check-in).
- Throughput: The system should handle a specified number of concurrent users or transactions per second.
- Scalability: The system should be scalable to accommodate increased load during peak periods.

ii. Security:
- Data Security: Data should be protected through encryption, access control, and secure authentication mechanisms.
- Compliance: The system should comply with data protection regulations (e.g., GDPR) and industry security standards.
- Authentication and Authorization: Strong user authentication and authorization controls should be in place.
- Audit Trails: Logging and auditing of system activities should be implemented for security monitoring.

iii. Documentation and Training:
- Comprehensive documentation for users and administrators.
- Training materials and user guides to ensure effective system utilization.

iv. Usability and User Experience (UX):
- User-Friendly Interface: The system should have an intuitive and user-friendly interface.
- Accessibility: The system should be accessible to individuals with disabilities, adhering to accessibility standards (e.g., WCAG).
- Consistency: User interface elements and interactions should be consistent throughout the application.

v. Compatibility:
- The system should be compatible with various web browsers, operating systems, and devices (desktop, mobile, tablet).

vi. Availability:
- Uptime: The system should be available 24/7, with minimal planned downtime for maintenance.
- Fault Tolerance: The system should continue to operate in the presence of hardware or software failures.

vii. Reliability:
- The system should consistently perform its intended functions without errors or failures.
- Mean Time Between Failures (MTBF) and Mean Time to Repair (MTTR) should be defined and optimized.

8. Appendices:

1) Google Translate
www.translate.google.co.in

2) PyPI · The Python Package Index
www.pypi.org

3) Python Dictionaries (w3schools.com)
www.w3schools.com

4) The web framework for perfectionists with deadlines | Django (djangoproject.com)
www.djangoproject.com

5) Bootstrap · The most popular HTML, CSS, and JS library in the world. (getbootstrap.com)
getbootstrap.com

6) ORM Quick Start — SQLAlchemy 2.0 Documentation
docs.sqlalchemy.org

Tool/Material needed:

Hardware Requirement:

- Smart Phone device.
- Display with resolutions 480x854 pixel.
- Processor: Quad-core 1.1 GHz or higher.
- Built-in GPS for location tracking.

Software Requirement:

- Any browser: HTML5 supported, JS enabled.
- Database at server side.

Android device:

- O.S: Android 5.0 or higher.
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iOS device:

- O.S: iOS 11 or higher