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PROJECT NAME -

Hotel Management System using And/or Gate and Identifying Functional and Non Functional Requirements

UNDER THE GUIDANCE OF

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Introduction

The hotel management system is a multifaceted solution designed to streamline operations, enhance guest experiences, and optimize resource utilization. This document outlines the critical stakeholders involved, the functional and non-functional requirements necessary for system effectiveness, a method for prioritizing these requirements using fuzzy TOPSIS, and the implementation steps for key functionalities. These elements collectively ensure the system's success and functionality.

Task 1: Stakeholder Identification

Identifying stakeholders is crucial for understanding the various roles and interests that influence the hotel management system:

- **Hotel Owners**: Focus on maximizing revenue, optimizing operations, and ensuring customer satisfaction. Their interests include profitability, cost control, and strategic decision-making.
- **Managers**: Responsible for day-to-day operations, requiring tools for efficient staff management, inventory control, and guest services.
- **Staff:** Includes front desk personnel, housekeeping, maintenance, and other members who need user-friendly interfaces and adequate training to perform their duties effectively**.**
- **Guests:** Expect seamless booking experiences, personalized services, and quick issue resolution during their stay.
- **IT Support Teams:** Ensure system reliability, data security, and provide technical support for users.
- **Vendors:** Supply products or services to the hotel, such as software solutions, cleaning supplies, or food items**.**

- **Regulatory Authorities:** Ensure compliance with industry regulations, safety standards, and data protection laws**.**

- **Marketing Teams:** Use guest data for targeted promotions, loyalty programs, and brand building.

Task 2: List of Functional Requirements (FRs) and Non-Functional Requirements (NFRs)

Functional Requirements:

1. **Reservation System:**
    - Search for available rooms based on dates, room types, and amenities.
    - Select rooms, add special requests, and confirm bookings.
    - Send confirmation emails with booking details and cancellation policies.

2. **Room Availability Management:**
    - Display real-time room availability.
    - Update room status automatically after check-ins, check-outs, and cancellations.
    - Generate occupancy reports for forecasting and planning**.**

3. **Guest Registration Process:**
    - Capture guest information securely.
    - Offer loyalty program enrolment and personalized service preferences.

4. **Laundry Service Provision:**
    - Schedule laundry pickups, select service types, and track order status.
    - Integrate laundry billing with room charges.

5. **Cleaning Services:**
    - Schedule cleaning staff based on room occupancy and guest requests.
    - Monitor cleaning supplies inventory and automate reordering.
    - Ensure timely room cleaning.

Non-Functional Requirements:

1) **System Security:**
    - Implement encryption protocols for data protection.
    - Restrict access to sensitive information.
    - Conduct regular security audits.

2) **Performance Requirements:**
    - Maintain system responsiveness under varying loads.
    - Ensure high availability and scalability.

3) **User Interface Design:**
    - Design intuitive interfaces with support for multiple languages and accessibility features.
    - Conduct usability testing.

4) **Scalability:**
    - Design system architecture for growth and integration with third-party systems.
    - Plan for upgrades and expansions.

5) **Reliability:**
    - Implement data backup and recovery mechanisms.
    - Schedule regular maintenance tasks and establish disaster recovery plans.

Task 3: Elicitation, Modelling, and Computation of Ranking Values using Fuzzy TOPSIS

Eliciting requirements involves engaging with stakeholders through interviews to gather their needs, preferences, and priorities. Modelling these requirements using use cases or user stories provides a structured representation of system interactions and behaviours.

Fuzzy TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) is used to evaluate and prioritize requirements based on criteria such as importance, feasibility, cost, and impact on system performance. This method handles the uncertainty and vagueness in decision-making by using fuzzy logic to process imprecise or subjective information provided by stakeholders. By calculating ranking values for each requirement, fuzzy TOPSIS helps identify the most critical and valuable features to include in the hotel management system.

Task 4: Implementation of Reservation System and Guest Registration Process

Implementing the reservation system and guest registration process in Python involves the following steps:

1. **Database Design:**

Define the schema to store guest information, room availability data, reservation details, and other relevant information.

2. **User Interface Development:**

Design user-friendly interfaces for guests to make reservations and register, and for staff to manage bookings and guest information.

3. **Business Logic Implementation:**

Write code to handle reservation logic, room allocation, payment processing, guest registration, and loyalty program enrolment.

4. **Integration with External Services:**

Integrate payment gateways, email services for confirmation notifications, and loyalty program APIs.

5. **Testing and Debugging:**

Conduct thorough testing to ensure the implemented features work as intended, handle edge cases, and provide error-free user experiences.

6. **Deployment and Maintenance:**

Deploy the features to a test environment for validation before rolling out to production. Regular maintenance and updates are essential to keep the system running smoothly.

Conclusion:

By addressing stakeholder needs, defining comprehensive requirements, prioritizing features using fuzzy TOPSIS, and implementing key functionalities, the hotel management system can significantly enhance operational efficiency and guest satisfaction. This structured approach ensures that the system meets diverse user expectations and remains robust, scalable, and secure.