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REAL TIME APPLICATION
(Car Rental Management System)

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Car Rental Management System

The Car Rental Management System is a comprehensive software solution aimed at streamlining the operations of car rental businesses. It focuses on automating key processes such as booking, vehicle management, and payment handling while ensuring data security and user convenience. This report outlines the project scope, objectives, process model, functional and non-functional requirements, and the work breakdown structure, along with Gantt and PERT charts for project management.

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1. Introduction

The Car Rental Management System is designed to enhance the efficiency of car rental businesses by automating key functions. It includes modules for user registration, vehicle booking, fleet management, and payment processing. The system aims to minimize manual effort, reduce errors, and provide a seamless experience for users.

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2. Analysis and Identification of Suitable Process Models

2.1 Suitable Process Models

The Agile methodology is identified as the most suitable process model for this project. Agile emphasizes iterative development, collaboration, and adaptability, making it ideal for projects with evolving requirements.

2.2 Justification

- **Flexibility:** Agile allows for continuous feedback and adaptation.
- **Incremental Delivery:** Features can be developed and tested in iterations, ensuring faster delivery.
- **Stakeholder Involvement:** Regular updates and feedback loops keep stakeholders engaged.

3. Scope and Boundaries

3.1 Scope

The system includes the following functionalities:

- User registration and authentication
- Vehicle inventory management
- Booking and reservation system
- Payment processing and invoicing
- Reporting and analytics

3.2 Boundaries

Excluded from the scope:

- Vehicle maintenance tracking
- Insurance claim management

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4. Goals and Constraints

4.1 Goals

- Develop a user-friendly interface for seamless booking.
- Ensure secure data storage and processing.
- Optimize resource allocation and vehicle availability.

4.2 Constraints

- **Timeline:** Project completion by March 31, 2025.
- **Resources:** Limited to a team of a single developer with expertise in web development and database management.

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5. Functional and Non-Functional Requirements

5.1 Functional Requirements

1. **User Management:**
    - User registration and login.
    - Profile management.
2. **Vehicle Management:**
    - Add, update, and delete vehicle details.
    - Real-time availability tracking.
3. **Booking System:**
    - Vehicle reservation and cancellation.
    - Booking history tracking.
4. **Payment Processing:**
    - Online payment integration.
    - Invoice generation.
5. **Admin Module:**
    - User and vehicle management.
    - Reporting and analytics.

5.2 Non-Functional Requirements

1. **Performance:**
    - Handle 100 concurrent users.
    - Response time under 2 seconds for critical operations.
2. **Security:**
    - Data encryption for sensitive information.
    - Role-based access control.
3. **Scalability:**
    - Support future expansion to multiple locations.
4. **Usability:**
    - Intuitive user interface with minimal training required.

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6. Process Model Selection and Justification

The Agile methodology was selected for its iterative approach, which allows for frequent feedback and incremental delivery of features. This ensures alignment with stakeholder expectations and adaptability to changing requirements.

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7. Work Breakdown Structure

1. Project Initiation

- Define project scope, objectives, and deliverables.
- Identify stakeholders and gather initial requirements.

2. Requirement Gathering and Analysis

- Conduct interviews and surveys with car rental staff and customers.
- Identify core functionalities (e.g., reservation, vehicle tracking).
- Document functional and non-functional requirements.

3. Design

- **System Architecture Design:** Define the system's architecture (e.g., client-server model).
- **Database Design:** Create an ER diagram for vehicles, customers, and bookings.
- **User Interface Design:** Develop wireframes and prototypes for the web and mobile interfaces.

4. Development

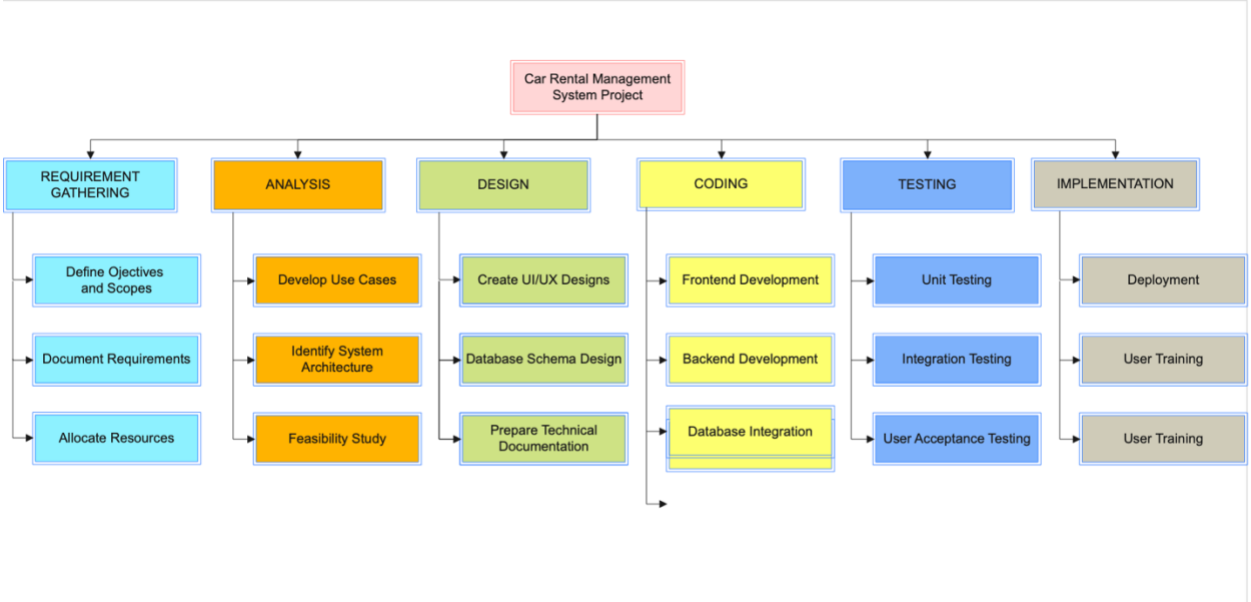
- **Frontend Development:** Build customer and admin dashboards.
- **Backend Development:** Implement APIs for booking, payments, and vehicle management.
- **Database Integration:** Set up and connect the database to the system.

5. Testing

- **Unit Testing:** Test individual modules like customer registration and payment processing.
- **Integration Testing:** Ensure smooth interaction between modules (e.g., reservation and inventory).
- **System Testing:** Verify the entire system's functionality and performance.

6. Implementation

- Deploy the system on the production server.
- Train staff on system usage through workshops and manuals

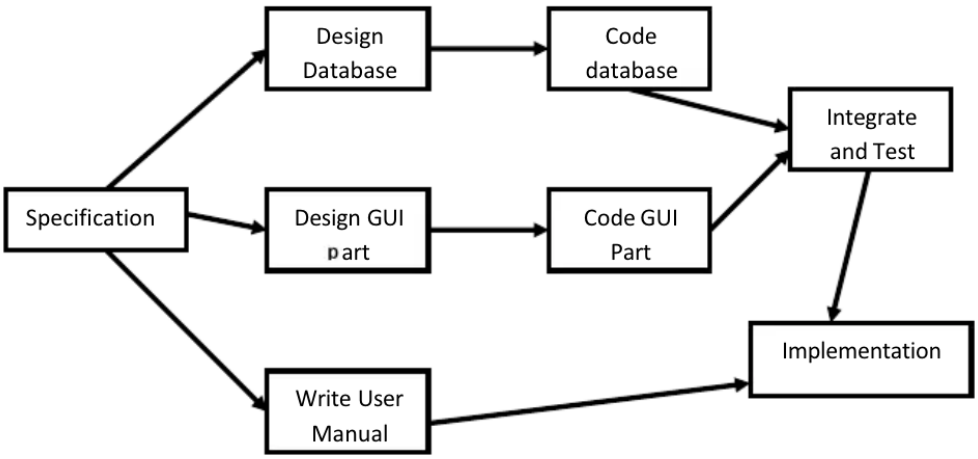


Work Breakdown Structure

8. Gantt Chart and PERT Chart

Car Rental Management System
Gantt Chart

ID	Task Name	Start	Finish	Duration
1	Requirement Gathering	01/01/2025	15/01/2025	15.0 d.
2	Analysis	16/01/2025	31/01/2025	16.0 d.
3	Design	01/02/2025	14/02/2025	14.0 d.
4	Coding	15/02/2025	15/03/2025	29.0 d.
5	Testing	16/03/2025	25/03/2025	10.0 d.
6	Implementation	26/03/2025	31/03/2025	6.0 d.



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9. GitHub Repository

A GitHub repository has been created to manage the project code. Regular commits with descriptive messages will be maintained.

- Repository Link:

10. Conclusion

The Car Rental Management System is a robust solution designed to streamline car rental operations. By leveraging Agile methodology and adhering to IEEE standards, the project aims to deliver a high-quality product within the stipulated timeline and budget.