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**Optimizing Car Rental Management: Enhancing User Experience with Web-Based Online Booking Solutions**

**Introduction**

**1.1 Document Purpose**

The purpose of this document is to outline the functional and nonfunctional requirements for a web-based car rental management system. This document serves as a guide for the development team to enhance the platform’s existing features, ensure efficient operation, and provide a smooth user experience focused on vehicle rentals.

**1.2 Statement of the Problem**

The car rental industry faces several key issues that impact how well it serves users. First, many car rental websites have complicated booking processes that frustrate users and lead to many abandoned reservations. Making these booking steps simpler is important for improving user satisfaction and increasing completed bookings. Second, these platforms often have inconsistent and outdated designs across different devices, which creates a disjointed experience. To fix this, a unified and user-friendly design that works well on all devices is needed. Finally, current car rental services usually offer limited ways for users to personalize their experience, such as setting vehicle preferences or accessing rental history. Adding these personalization features is essential for making the service more engaging and satisfying for users

**1.3 Limitation**

The car rental web application is specifically designed for small to medium-sized car rental businesses in Cavite, so it may not be suitable for larger companies or those outside the region. It focuses on basic features like booking management, real-time vehicle availability, and customer personalization, which may not cover more advanced needs of bigger companies, such as managing multiple locations or detailed reporting. The application may also have compatibility issues with existing hardware, requiring specific setups that not all businesses have. Additionally, integrating the application with other software, like accounting or fleet management systems, might be challenging for businesses that rely on these tools. For the application to be successfully implemented, proper staff training is essential; otherwise, resistance to change or a lack of technical skills among employees could prevent effective use of the new system.

**1.4 Product Scope**

The platform allows users to search for and rent vehicles, manage their bookings, and access customer support. The scope of this document includes detailing current functionalities, identifying areas for improvement, and ensuring the platform meets user needs while maintaining a user-friendly interface.

**Specific Requirements**

**2.1 Functional Requirements**

**2.1.1 User Account Management**

**REQ001.** The system shall allow users to create, update, and delete their accounts.

**REQ002.** The system shall allow users to save and manage personal preferences, rental history, and payment information.

**2.1.2 Booking Management**

**REQ003.** The system shall provide a search function for users to find available vehicles based on criteria such as date, location, vehicle type, and price range.

**REQ004.** The system shall support the entire booking process, including selecting a vehicle, choosing additional services (e.g., insurance, GPS), and completing the reservation with payment.

**REQ005.** The system shall send confirmation notifications via email or SMS upon booking completion.

**2.1.3 Real-time Vehicle Availability and Pricing**

**REQ006.** The system shall provide real-time updates on vehicle availability, reflecting bookings, cancellations, and returns.

**REQ007.** The system shall dynamically adjust pricing based on demand, availability, and other factors.

**2.1.4 User Interface and Experience**

**REQ008.** The system shall provide a unified, intuitive interface consistent across desktop, tablet, and mobile devices.

**REQ009.** The booking process shall be streamlined to minimize steps and improve completion rates, with clear instructions and progress indicators.

**2.1.5 Personalization Features**

**REQ010.** The system shall allow users to set and save vehicle preferences (e.g., type, model, transmission).

**REQ011.** The system shall provide tailored vehicle recommendations based on user preferences, rental history, and browsing behavior.

**2.1.6 Feedback Mechanism**

**REQ012.** The system shall allow users to submit feedback on their rental experience, including ratings and comments.

**REQ013.** The system shall collect and analyze user feedback to generate reports for continuous improvement.

**2.1.6 Car Maintenance Scheduling**

**REQ014.** The system shall track vehicle maintenance schedules and notify admins when a vehicle is due for maintenance.

**REQ015.** The system shall inform users if a vehicle is unavailable due to scheduled maintenance.

**2.1.6 Admin Dashboard**

**REQ016.** The system shall allow admins to manage vehicle inventory, update availability and pricing, and view booking statistics.

**REQ017.** The system shall provide admins with access to reports on user feedback, booking trends, and vehicle performance.

**2.2 Non-Functional Requirements**

**2.2.1 Performance Requirements**

**REQ018.** The system shall handle at least 100 concurrent users without performance degradation.

**REQ019.** Page load times shall not exceed 2 seconds under typical usage conditions.

**2.2.2 Scalability Requirements**

**REQ020**. The system shall be able to scale to accommodate growth in user base and vehicle inventory without major modifications.

**REQ021.** The architecture shall support future integration with other systems (e.g., accounting, CRM) with minimal disruption.

**2.2.3 Security Requirements**

**REQ022.** The system shall implement SSL encryption for all data transmissions to protect user information.

**REQ023.** The system shall secure user authentication with multi-factor authentication (MFA) for admin accounts.

**REQ024.** The system shall comply with data protection regulations, ensuring that user data is stored and processed securely.

**2.2.4 Usability Requirements**

**REQ025.** The user interface shall be intuitive, with a consistent design that adapts well to various screen sizes and resolutions.

**REQ026.** The system shall be accessible to users with disabilities, following the Web Content Accessibility Guidelines (WCAG).

**2.2.5 Reliability Requirements**

**REQ027.** The system shall have an uptime of 99.9%, with automated monitoring and alerting to detect and address issues promptly.

**REQ028.** The system shall have data backup procedures in place to ensure that all user and booking data is preserved and can be restored in case of system failure.

**2.2.6 Maintainability Requirements**

**REQ029.** The codebase shall be modular and well-documented to facilitate future updates and enhancements.

**REQ030.** The system shall allow for easy updates and patches without requiring downtime.

**2.2.7 Compatibility Requirements**

**REQ031.** The system shall be compatible with all major browsers (Chrome, Firefox, Safari, Edge) and operating systems (Windows, macOS, iOS, Android).

**REQ032.** The system shall integrate seamlessly with existing hardware setups commonly used by small to medium-sized car rental businesses.

**2.2.8 Localization Requirements**

**REQ033.** The system shall support localization, allowing it to be easily adapted to different languages and regional formats (e.g., date, currency).