# Abstract

Traditional car rental processes require customers to visit multiple agencies or make numerous calls to check vehicle availability, making the process inefficient and time-consuming. Even after significant effort, customers may not find the desired vehicle, leading to frustration. Similarly, rental agencies relying on paper-based record-keeping face challenges in tracking customer details, vehicle availability, and maintenance history.

The proposed **Car Rental Management System (CRMS)** web-based platform that streamlines operations with real-time vehicle availability, online reservations, and automated customer management. Customers can browse available vehicles, view promotions, book rentals, manage accounts, and submit feedback. On the other hand, rental agencies benefit from **centralized data storage**, **secure customer record management**, and **efficient vehicle tracking**.

By **digitizing and automating** these processes, the CRMS enhances operational efficiency, improves customer satisfaction, and reduces administrative overhead, making car rentals more accessible and manageable for businesses in Palestine.

# Objective

The **Car Rental Management System (CRMS)** aims to modernize car rental operations in **Palestine** by replacing **manual, paper-based workflows** with a **centralized digital platform**. The system is designed to enhance efficiency, **reduce administrative overhead**, and improve the **customer experience**. Specifically, CRMS will:

**1. Automate Core Processes**

* Provide **real-time updates** on vehicle availability, ensuring accurate and up-to-date listings.
* Digitize **customer records** (driver’s licenses, rental agreements) and **vehicle data** (insurance, registration, maintenance schedules) for seamless management.

**2. Enhance Customer Experience**

* Allow users to securely create private accounts (email/password authentication)
* Enable users to **browse available vehicles, book reservations, and track rentals** via a **bilingual (Arabic/English) web portal**.

**3. Optimize Business Operations**

* Provide role-based admin accounts for rental agencies to manage sensitive customer data, vehicle records, and system settings securely
* Reduce **manual errors** in **billing and inventory tracking** through **automated workflows**.
* Streamline **maintenance scheduling** and **legal compliance**, ensuring vehicles remain roadworthy and fully documented.

**4. Ensure Data Security**

* Implement secure authentication protocols (e.g., password hashing) for customer and admin accounts.
* Restrict admin access to authorized personnel only, minimizing risks of unauthorized data modification.

By prioritizing **accessibility and efficiency**, CRMS seeks to improve **service quality** for customers while **cutting administrative costs** for Palestinian rental agencies.

# Document Convention

# Intended Audience and Reading Suggestions

This document is intended for stakeholders involved in the development, deployment, and use of the **Car Rental Management System (CRMS)**. The key audiences are:

1. **System Developers**
   * **Role**: Design, implement, and maintain the CRMS.
   * **Focus**: Technical specifications, API integration, and security protocols.
2. **Rental Agency Owners/Managers**
   * **Role**: Use the system to manage vehicles, customers, and financial workflows.
   * **Focus**: Business features (e.g., billing, reporting) and user roles.
3. **End Users (Customers)**
   * **Role**: Rent vehicles via the CRMS portal.
   * **Focus**: Booking workflows, account management, and feedback submission.
4. **IT Administrators**
   * **Role**: Ensure system security, data integrity, and compliance.
   * **Focus**: Access controls, encryption standards, and audit logs.
5. **PTUK Faculty**
   * **Role**: Evaluate academic compliance and SRS structure.
   * **Focus**: IEEE formatting, traceability, and project scope.

# Project Scope

This section defines the boundaries of the Car Rental Management System (CRMS), including its core functionalities, technical limitations, and excluded features.

**In-Scope Features**

The CRMS **will** include the following functionalities:

| **Category** | **Features** |
| --- | --- |
| **User Management** | - Secure account registration (email/password).  - Role-based access (Admin, Customer).  - User profile management (update personal details, password reset). |
| **Vehicle Rental Management** | - Real-time vehicle availability.  - Online booking. |
| **Payment & Billing** | - Automated cost calculation (daily/weekly rates).  - Invoice generation. |
| **Business Operations** | - Maintenance/insurance tracking.  - Basic revenue/fleet performance reports. |
| **Technical Scope** | - Web-based platform (desktop/mobile-responsive).  - Password hashing (SHA-256). |

**Out-of-Scope Features**

The CRMS **will not** include:

| **Feature** | **Reason for Exclusion** |
| --- | --- |
| **Mobile app development** | Prioritizes web accessibility due to budget/resource constraints. |
| **GPS tracking integration** | Hardware-dependent and cost-prohibitive for small rental agencies. |
| **Identity Verification** | Limited budget for third-party integrations |

**Constraints**

* **Internet Dependency**: Core features require internet
* **Budget**: Limits integration with paid APIs (e.g., KYC APIs).

**Assumptions**

* **User Literacy**: Customers and staff can navigate a bilingual web interface.
* **Legal Compliance**: Rental agencies maintain up-to-date insurance and registration documents, while customers upload valid identification (ID and driver’s license).
* **Document Verification**: Palestinian IDs and driver’s licenses will be manually verified by rental agency staff.
* **Inventory Updates**: Rental agencies will manually add and remove vehicles from the fleet as needed.

# References