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**College of Engineering and Technology**

Department of Computer Systems Engineering

**Course name:** Software Engineering

**Project title:**

Car Rental Management System

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# 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**.  
  
Theproposed **Car Rental Management System (CRMS)** is a **web-based platform** that streamlines operations with **real-time fleet 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.

# Introduction

## Purpose

The purpose of this document is to provide a comprehensive description of the **Car Rental Management System (CRMS)**. It outlines the system’s objectives, features, technical interfaces, operational constraints, and responses to user interactions. It also serves as a reference for stakeholders to ensure the system meets the specified requirements and objectives.

## Document Convention

### Text Styles

| **Style** | **Usage** | **Example** |
| --- | --- | --- |
| **Bold** | Mandatory requirements, key terms. | **real-time fleet availability** |
| *Italics* | examples, technical terms, or emphasis. | (*e.g., insurance, registration*), *API* |

### Abbreviations

| **Abbreviation** | **Meaning** |
| --- | --- |
| **CRMS** | Car Rental Management System |
| **KYC** | Know Your Customer (ID verification) |
| **API** | Application Programming Interface |

### Terminology

* + **Role-Based Access:** Privileged accounts (*e.g., Manager*) with restricted permissions.
  + **Fleet:** Collection of vehicles owned by the rental agency

## Intended Audience and Reading Suggestions

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

### System Developers

* + **Role:** Design, implement, and maintain the CRMS.
  + **Focus:** Technical specifications, *API* integration, and security protocols.

### 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.

### End Users (Customers)

* + **Role:** Rent vehicles via the CRMS portal.
  + **Focus:** Booking workflows, account management, and feedback submission.

### 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

* **User Management:** Secure accounts (email/password), role-based access (Admin/Customer).
* **Vehicle Management:** Real-time availability, online booking.
* **Payment & Billing:** Automated cost calculation (daily/weekly rates).
* **Business Operations:** Maintenance/insurance tracking, basic reports.
* **Technical Scope:** Web-based (mobile-responsive).

### Out-of-Scope

* Mobile apps.
* GPS tracking.
* Third-Party KYC tools.

### Constraints

* Internet required.
* Budget limits.

### Assumptions

* **User Literacy:** Customers and staff can navigate a web interface.
* **Legal Compliance:** Both Customers and agencies upload valid documentations
* **Manual Verification:** Agencies manually verify customers’ IDs and driver Licenses.

# References

[1] PTUK Software Engineering Course, “*Sw Eng Assignment - Part 1.pdf: Software Requirements Specification (SRS)*” 2025. [Online]. Available: <https://lms.ptuk.edu.ps/mod/assign/view.php?id=633283>

[2] IEEE Standards Association, “*IEEE Recommended Practice for Software Requirements Specifications*” IEEE Std 830-1998, 1998. [Online]. Available: <https://standards.ieee.org/ieee/830/1222/>

# Overall Description

## Product Perspective

**Syarti** (**CRMS**) is currently developed as a standalone **front-end** **prototype** of a web application that acts as the **main entry point** for users before login for all user roles (**Customer**, **Admin**, and **Employee**). This **prototype** focuses solely on the presentation layer and *does not* include any **backend logic** or **database** connectivity.

The system is built using **HTML5**, **CSS3**, **Bootstrap 5 RTL**, and **Font Awesome icons**, and is deployed *publicly* via **GitHub Pages**. The user interface is *responsive* and optimized for both **desktop** and **mobile** browsers.

There are *no* external interfaces like **APIs** or **third-party services** connected yet. However, future development plans include implementing an **admin dashboard**, **backend logic**, and a **database** for *car inventory management*, *user accounts*, and *transactions*. While support for **payment gateways** is also considered, it *has not been* implemented yet.

## **Product Functions**

The implemented **home page** *provides* users with a visually structured experience, laying the groundwork for more advanced functionality and extensive features planned for different **user roles** in future phases.

### Implemented UI Features:

* **Navigation bar** for accessing different sections.
* **Booking form** for selecting location and dates.
* Static **car listing** with pricing and specifications.
* **View All Cars button**.
* **Testimonials** and **customer ratings**.

### Planned Functional Features:

#### **Customer Role:**

* **Book**, **cancel**, and **manage** reservations.
* Secure **online payments**.
* View **rental history**.
* Manage **account details**, **legal documents**, and **payment options**.
* Submit and view **customer feedback**.

#### **Admin Role:**

* Real-time **vehicle inventory** management.
* **Approve** or **reject** bookings.
* Oversee **customer accounts** and **documents**.
* Generate **car services reports**.
* Track **expenses**, **taxes**, and **financial reports**.
* Control **home page offers** and **pricing rules**.

#### **Employee Roles:**

* **Pickup/Dropoff Handlers:** View accepted car **bookings**, assign themselves to **car handoffs**, view customer **booking data** and his **contact info**.
* **Fleet Managers:** Manges **car details** (*add*, *remove*, *update*), **insurance** and **registrations**, **service logs**.
* **Legal Verifiers:** Review and **validate** customers' *IDs* or *Passports*, *licenses*, cars' *insurances* and *registrations*, and run **background checks**
* **Accountants:** Review all **tax** and **expense reports** (*fuel*, *insurances*, *registrations*, *maintenance fees*).

## User Classes and Characteristics

**Syarti** system is designed to support *multiple* **user types**, each with **distinct roles** and **responsibilities**. These user classes include **Customers**, **Admins**, and various categories of **Employees**. Each employee role has *tailored* system access *suited* to their specific tasks.

### Customers

* General users who **rent cars** via the platform.
* Can **view**, **book**, and **cancel** **reservations**.
* **Manage** *profiles*, *documents*, and *payments*.
* Submit and view **feedback**.
* Use *smartphones* or *PCs*.
* Expected to have *low to moderate* **technical knowledge**.

### Admins

* Business ***owners*** or system ***supervisors***.
* **Manage** *fleet inventory* and *bookings*.
* **Oversee** *customer profiles* and *legal docs*.
* **Review** **financial reports** (*expenses*, *taxes*, *service logs*).
* *Moderate to advanced* **technical familiarity** expected.

### Employees

#### Pickup/Dropoff Handler

* Manages car **handovers** to/from customers.
* Views *approved* **bookings’ data** and customers’ **contact info**.

#### Fleet Manager

* Updates **vehicle data**, **maintenance records**, **insurance** and **registration**.

#### Legal Verifier

* Reviews *IDs* or *passports*, *licenses*, *insurance policies*, and *registrations documents*.
* Performs ***background checks*** for *new* customers.

#### Accountant

* Reviews *bills* and *taxes*, as well as *fuel*, *service*, *insurance* and *registration expenses*.

## Operating Environment

* **Deployment Platform:** **GitHub Pages** (*public access* via direct **URL**)
* **System Type:** *Front-end-only prototype* (**HTML5**, **CSS3**)
* **Frameworks/Libraries:**
  + **Bootstrap 5 RTL**
  + **Font Awesome for icons**
* **Browser/Device Compatibility:**
  + Fully **tested** on modern browsers: *Chrome*, *Firefox*, *Safari*, *Edge*
  + **Responsive** on both *desktop* and *mobile*
  + *No minimum* **version requirements**
* **Language and Layout:**
  + **Arabic-only** interface
  + **Fully RTL** support (*including forms and components*)
* **Backend and Database:**
  + *No* **backend**, **APIs**, or **database** currently implemented
  + *No* **hosting plan** yet for future **backend**

## Design and Implementation Constraints

**Syarti** project is being developed solely for **educational** purposes and is currently subject to several *design* and *implementation* **constraints**. While *there are no* **restrictions** on the use of **backend technologies**, the team **lacks** the required experience in **backend development**, and **API integration**. As a result, the system is currently **limited** to a **front-end-only prototype** and hosted via **GitHub Pages** *by choice*, with *no external* **limitations**.

The application is designed for **Arabic-speaking users** only, and no **multilingual** or accessibility support is currently implemented. Due to the **academic nature** of the project, *there are no* *requirements* to follow **privacy laws**, **rental regulations**, or **data protection** practices, and the system *does not* **store** or **handle** any **user data**.

## Assumptions and Dependencies

**Syarti’s** prototype is developed under a set of **practical assumptions** and **dependencies**

### Assumptions:

* Users *will have* access to **modern** **desktop** or **mobile** browsers.
* Users *will have* a stable **internet connection**.
* The development team *will acquire* **backend development skills** in future phases.

### Dependencies:

* **Hosting** depends on the *continued availability* of **GitHub Pages**.
* **UI** depends on the **Bootstrap 5 RTL** framework and **Font Awesome icon** library.
* Future features *will depend* on integration with **third-party** services such as ***payment gateways*** and ***database*** systems.