

DEAKIN UNIVERSITY

APPLIED SOFTWARE ENGINEERING

ONTRACK SUBMISSION

Write a SRS Document

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Outcome	Weight
ULO1	◆◆◆◆◆
ULO2	◆◆◆◆◆
ULO3	◆◆◆◆◆
ULO4	◆◆◆◆◆

Software Requirements Specification (SRS) document teaches beginners several key concepts related to software development, project management, and system design.

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Software Requirement Specification (SRS) for Locate a Socket

1. Introduction

1.1 Document Purpose

This document contains the Software Requirements Specification (SRS) of the Locate a Socket web application. It is addressed to software developers, testers, project managers, and stakeholders who will be involved in the design, development, and maintenance of the system.

1.2 Product Scope

Locate a Socket is a web application that helps electric vehicle (EV) drivers to discover charging stations easily on the way. Using location services, the application helps users discover, use and make safe payments for EV charging. The main objective of Locate a Socket is to offer an easy, effective and simple way to solve the problem of the need for the accessibility of the EV charging infrastructure.

1.3 Document Overview

This document defines the software requirements of Locate a Socket, including: An overview of the system, the requirements are broken down into functional and non-functional requirements, and constraints. It consists of:

- Section 2: Gives an overall view of Locate a Socket, including the viewpoint, the goals, who will use the system and their characteristics, constraints and assumptions.
- Section 3: Explains in detail the requirements such as external interfaces, functional and non-functional requirements.
- Section 4: Supports the information above.

1.4 Definitions, Acronyms and Abbreviations

- UI: User Interface
- API: Application Programming Interface
- EV: Electric Vehicle
- GPS: Global Positioning System
- LBS: Location-Based Services
- SOC: State of Charge
- RFID: Radio-Frequency Identification
- kWh: Kilowatt-hour

2. Overall Description

2.1 Product Perspective

Find a Socket is a web application that helps electric vehicle drivers in their search for charging stations. It combines work with different mapping services, payment gateways, and charging station networks to offer real-time information and services. The system is based on a cloud infrastructure for route planning, real-time availability updates, and secure payment processing.

2.2 Product Functions

Locate a Socket has the following core functionalities:

- User registration and profile creation
- Electric vehicle information management
- Charging station search and discovery
- Route planning and charging stops
- Real-time charging station availability
- Reservation of charging stations
- Payment processing for charging stations
- Rating and review system for charging stations
- Trip history and statistics
- Notifications for nearby stations or completed charging

2.3 User Characteristics

General Users: EV drivers who use the service to find charging stations are likely to have basic to moderate technical proficiency and are capable of navigating web and mobile applications without much difficulty.

Charging Station Operators: Companies that control charging stations and provide information on their availability and status. They are predicted to have a moderate technical understanding of the station's control.

Administrative Users: The personnel who operate the platform, answer user's questions and solve problems with it. They should be technically savvy and aware of the basics of the account and standard platform functions.

Business Partners: For instance, charging network providers and payment service providers who are integrating with the system would typically be classified as advanced users. They often have more technical understanding and typically engage with the platform via Application Programming Interfaces (APIs) and integration tools.

2.4 Constraints

- Must support major web browsers (Chrome, Firefox, Safari, Edge)
- Must be responsive for desktop, tablet, and mobile devices
- Must comply with data protection regulations (GDPR, CCPA)

- Must support secure payment gateways for transaction processing
- Location accuracy is subject to GPS signal strength and device capability
- Real-time availability depends on charging station operators' system integration

2.5 Assumption and Dependencies

- Users must have a stable internet connection to access the application
- GPS or location services must be enabled on the user's device
- Charging station operators must provide accurate and timely data
- Third-party mapping services (Google Maps, OpenStreetMap) must be operational
- Payment processing will be handled through third-party payment gateways
- Charging networks must provide APIs for integration with the platform

3. Specific Requirements

3.1 External Interfaces

- User Interface: Web-based responsive application optimized for desktop and mobile devices.
- Hardware Interfaces: Compatible with devices supporting GPS and location services.
- Software Interfaces: Integration with mapping services, charging station networks, and payment providers.
- Communication Interfaces: Supports RESTful API for third-party integrations, Email and push notifications for user alerts.

3.2 Functional Requirements

- User Registration & Authentication: Users must be able to create an account using email or third-party authentication (Google, Apple ID). Authentication must be secured using OAuth 2.0.
- Vehicle Profile Management: Users must be able to add, edit, and remove electric vehicles from their profile, including make, model, year, battery capacity, and connector types.
- Charging Station Search: Users must be able to search for charging stations based on location, availability, connector type, charging speed, and amenities. The search function must support filtering by distance, price, and user ratings.
- Route Planning: The system must calculate optimal routes incorporating necessary charging stops based on the vehicle's range, current state of charge, and destination. It must recommend charging stations along the route and estimate charging time.
- Real-time Availability: The system must display real-time availability status of charging stations, including occupied/available chargers, operational status, and waiting times when available.
- Reservation System: Users must be able to reserve charging slots at supporting stations for a specified time. The system must send reminders and allow cancellation of reservations.
- Payment Processing: Users must be able to pay for charging services through the app using stored payment methods (credit/debit cards, digital wallets). The system must support both pre-authorization and pay-per-use models, ensuring PCI-DSS compliance.

- Trip History & Statistics: Users must be able to view their charging history, including locations, duration, energy consumed, and costs. The system must provide visualizations of usage patterns and spending over time.
- Notifications: The system must send push notifications for reservation confirmations, charging completion, nearby available stations, and service disruptions at favourite stations.

3.3 Functional Requirements

- Performance: The system should respond to user queries within 2 seconds. Map rendering should be completed within 3 seconds.
- Security: User data and payment information must be encrypted using AES-256 encryption. The application must implement HTTPS for all communications.
- Availability: The service should have an uptime of 99.5% excluding scheduled maintenance.
- Scalability: The system should be able to handle at least 500,000 concurrent users and scale horizontally during peak usage periods.
- Reliability: The system should maintain accurate charging station information with a maximum data staleness of 15 minutes for availability status.
- Maintainability: The codebase should follow established coding standards and be documented to allow for easy updates and feature additions.
- Compatibility: The application must function correctly on the last two major versions of Chrome, Firefox, Safari, and Edge browsers.

4. Supporting Information

4.1 References

IEA. (2023). *Global EV Outlook 2023*. Retrieved from [iea.org](https://www.iea.org/reports/global-ev-outlook-2023):
<https://www.iea.org/reports/global-ev-outlook-2023>

Map, O. C. (n.d.). Open Charge Map.

Open Charge Map. (n.d.). Open Charge Map. Retrieved from Open Charge Map:
<https://openchargemap.org/site>