

SIT725 – Applied Software Engineering

TASK 2.1P Writing SRS document

Software Requirements Specification (SRS) for Locate a Socket Application

1. Introduction

1.1 Overview of the Software and Its Purpose

The Locate a Socket app is an handy web-based tool designed for electric vehicle (EV) drivers. It helps you easily find charging stations while you're out and about. By using location services, it provides real-time updates on nearby charging options, gives you directions, and even explains how to pay. This makes the whole charging experience a lot smoother for EV users. Ultimately, the app aims to encourage more people to switch to electric vehicles by addressing one of their biggest hurdles: tracking down available charging stations.

1.2 Identification of the Target Audience

This Software Requirements Specification (SRS) document is aimed at the development team, project stakeholders, product managers, and anyone else involved in both the technical and business aspects of the Locate a Socket application. The purpose of this document is to ensure that everyone shares a common understanding of the application's features, functionality, and performance expectations.

2. Purpose

2.1 Primary Objective of the Software

The primary objective of the Locate a Socket app is to assist electric vehicle (EV) drivers in easily locating charging stations and making secure payments for their charging needs. By providing real-time information on station availability, the app aims to alleviate range anxiety for EV users and improve their overall driving experience.

2.2 Intended Benefits for EV Drivers

Electric vehicle (EV) drivers have a lot to gain from their experience on the road. Here are some of the key benefits:

- **Convenient Location-Based Services:** It's great that EV drivers can easily find charging stations, thanks to GPS features. This means they can plan their trips more confidently without the constant worry of running low on battery.

- **Real-Time Availability Updates:** One of the major pain points for EV drivers is arriving at a charging station only to discover it's already full. With real-time updates, drivers can check whether a station is available before getting there, which makes the whole process less stressful and more efficient.
- **Seamless Payment Integration:** Paying for charging has become a breeze with secure online payment systems. Whether it's through an app or contactless options, drivers can swiftly complete their transactions without facing delays or hassles.
- **Route Optimization Tools:** These tools are a game-changer for EV drivers. They offer accurate directions to the nearest charging stations, helping maximize battery usage and minimize travel times.

All these features come together to create a smoother, more enjoyable experience for EV drivers. As a result, this encourages more folks to consider electric vehicles and contributes to more sustainable transportation overall.

3. Audience

3.1 Target Users

- **Electric Vehicle Drivers:** Owners of electric vehicles often need an app to easily locate nearby charging stations. They look for features like real-time availability, charging speeds, and route planning to ensure a smooth journey without battery anxiety.
- **Fleet Managers:** Organizations with electric vehicle fleets need tools to efficiently plan routes and ensure access to charging stations. They seek insights on charging usage and vehicle maintenance to minimize downtime and enhance productivity.
- **Charging Station Operators:** These operators require a reliable platform to manage charging stations, monitor their status, and handle payment processing. They also value customer feedback to improve their services and attract more users.
- **Application Administrators:** Responsible for maintaining the app, application administrators ensure accurate station information and manage user accounts. They address user issues and implement updates based on feedback to enhance the overall user experience.

3.2 Stakeholders

- **Software Development Team:** A group of developers, testers, and designers who create and enhance the application, ensuring it's functional and user-friendly.
- **Business Owners/Investors:** Individuals or organizations that fund and guide the application's development, focusing on achieving market success and profitability.
- **Payment Service Providers:** Companies that offer secure payment processing solutions for online transactions, providing features like fraud protection and multi-currency support.

4. Overall Description

4.1 Comprehensive Overview of the Software's Functionality

The Locate a Socket application is designed to facilitate electric vehicle charging by offering a range of features:

- **Search for Charging Stations:** You can easily find nearby EV charging stations using your current location or by entering a destination. The app also lets you filter results based on charging speed and distance to find the best option for you.
- **Real-Time Availability Information:** The app shows you which charging stations are available right now, helping you avoid queues and get charged up quickly.
- **Secure Payment Integration:** Paying for charging sessions is a breeze with the app's secure payment options. You can choose from various payment methods that suit you best.
- **Navigation and Directions:** Once you pick a charging station, the app provides clear maps and turn-by-turn directions to get you there smoothly, complete with real-time traffic updates.
- **User Account Management:** You can create a personalized profile to save your favorite stations, manage your payment methods easily, and keep track of your trip history. This makes the whole charging experience much more convenient for you..

4.2 Explanation of How the Software Operates

The Locate a Socket application will work in the following way:

- **User Login/Registration:** EV drivers can easily sign up or log in to the app with a secure process. Options like social media logins or email verification make it straightforward. Users can manage their profiles and check their charging history when needed.
- **Station Search:** Once logged in, drivers can enter their current location or destination to find nearby charging stations. The app shows important details like whether the stations are available, the types of chargers they have, user ratings, and how far away they are.
- **Station Selection:** After selecting a charging station, the app provides real-time updates on availability, so users know if the station is free or occupied. It also highlights any useful amenities nearby, like restrooms or food options.
- **Navigation:** The app offers turn-by-turn navigation to guide drivers directly to their chosen charging station. It even adjusts routes based on traffic to ensure a smooth trip.
- **Payment:** Once charging is complete, drivers can pay securely through the app using options like credit cards or digital wallets. They'll receive a digital receipt instantly for their records.
- **Feedback and Rating:** After the charging session, users can rate their experience and leave feedback about the station. This helps others make better choices and gives valuable insights for improving service.

5. External Interfaces

5.1 Map Interface

The application will connect with popular mapping services like Google Maps and OpenStreetMap to provide users with detailed location information, directions, and real-time traffic updates. This functionality is essential for helping drivers find their way to nearby charging stations efficiently. By using these mapping tools, the app will not only guide users to their selected charging points but also offer alternatives based on current traffic conditions, ensuring they can avoid delays. Additionally, the app will show estimated travel times and distances to make planning trips to charging stations as smooth as possible. Overall, this feature aims to enhance the convenience of electric vehicle charging for all users.

5.2 Charging Station APIs

The app will connect with APIs from different charging station operators, like ChargePoint and Tesla Supercharger. This will allow it to pull in real-time information about charging stations, including whether they're available, their exact locations, and if they're operational. By offering this up-to-date data, users will have a much easier time finding a charging station that meets their needs, making their charging experience smoother and more efficient.

5.3 Payment Gateway

The app will connect with popular payment providers like Apple Pay and PayPal to offer users a secure and convenient way to pay for charging services. By integrating these trusted platforms, the app ensures a smooth transaction process while giving users various payment options to choose from.

6. System Features

6.1 Search for Charging Stations

- **Description:** This app makes it easy for users to find electric vehicle charging stations. You can either use your phone's GPS to see what's nearby or enter a location manually, so you're never left searching for a charge.
- **Functional Requirements:** The system can automatically detect your location through GPS, but you can also type in a specific destination. Once your location is set, it shows a list of nearby charging stations, complete with details like the address, types of connectors available, pricing, and whether they're currently free or occupied. Plus, there might be filters to help you narrow down your options based on what you need, making your charging experience smooth and simple.

6.2 Real-Time Availability

- **Description:** The system aims to provide users with real-time updates about electric vehicle charging stations. It will clearly show whether each station is available for use, currently occupied by a charging vehicle, or out of service due to maintenance or repairs. This feature is essential for helping users plan their trips more effectively and avoid unnecessary waiting.
- **Functional Requirements:** To achieve this, the system will integrate with the APIs of various charging stations to pull in up-to-date information about their status. Users will be able to see accurate data regarding each station's availability, including how long it might be occupied and when it's expected to be free again. Additionally, notifications will be sent out for stations that are under maintenance. The goal is to make the charging experience as smooth and hassle-free as possible, ultimately supporting the growth of electric vehicle usage.

6.3 Directions and Navigation

- **Description:** This app is designed to make your trip to the charging station as smooth as possible. With user-friendly navigation, you'll get straightforward, step-by-step directions that are easy to follow. Plus, we'll keep you in the loop with real-time updates so you'll know exactly where to go and when to expect any changes along the way. Think of it as your personal navigator, dedicated to making sure your journey is hassle-free and enjoyable.
- **Functional Requirements:** To make this happen, the app will work seamlessly with popular map services, providing you with real-time route guidance and turn-by-turn directions. You'll benefit from features like live traffic updates and alternative routes if there's a delay. We want to ensure you reach your charging station efficiently, without any unexpected detours or frustrations.

6.4 Secure Payment Integration

- **Description:** Users can securely pay for charging services through the app, ensuring a convenient and trustworthy experience.
- **Functional Requirements:** The app will integrate a secure payment gateway for processing credit and debit card transactions. This includes safeguarding user data, supporting various payment methods, and providing instant transaction confirmations. The system should also allow for easy management of disputes and refunds, keeping the process simple for users.

6.5 User Account Management

- **Description:** Users can easily create and manage their personal accounts, allowing them to tailor their experience on the platform to better fit their needs. This feature is designed to give users full control over their settings and preferences.
- **Functional Requirements:**
 - **Profile Creation:** Users will have the option to set up a personalized profile by entering their basic information, such as their name and email. This will help personalize their experience and make it more relevant to them.

- **Saving Favourite Stations:** Users can bookmark their favourite stations, making it quick and easy to access them in the future without having to search each time.
 - **Payment Methods:** The account will provide a secure way for users to save and manage their payment options, like credit cards or digital wallets. This will simplify the payment process for any future transactions.
 - **Trip History:** Users will have a detailed log of their past trips, which makes it easy to look back at where they've travelled. This feature can also help with managing receipts and understanding travel habits. Overall, these features are designed to enhance user convenience and satisfaction, making it easier for them to navigate and enjoy the platform.
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7. Non-Functional Requirements

7.1 Performance Requirements

- The app needs to handle up to 10,000 users at once, ensuring a smooth experience without any lag or slowdowns.
- When users search for stations or directions, the app should respond within 3 seconds to keep things efficient.

7.2 Security Requirements

- We must encrypt all sensitive data, like user profiles and payment info, using SSL/TLS to keep it safe from prying eyes.
- Incorporating secure login features, such as two-factor authentication (2FA), is essential for protecting user accounts.

7.3 Reliability

- The application should be available 99.9% of the time, except during scheduled maintenance, to meet user needs.
- If something goes wrong, the system must be able to recover within 5 minutes to minimize downtime.

7.4 Usability Requirements

- The user interface should be intuitive and easy to navigate, ensuring accessibility for all users, including those with disabilities.
 - It's important that the app supports multiple languages and measurement units (like miles/kilometers and currency) to cater to a variety of users.
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8. Other Requirements

8.1 Platform Compatibility

The application needs to work smoothly on all the major web browsers like Chrome, Firefox, Safari, and Edge. This will make sure that everyone can access it easily, no matter what browser they prefer. It's also really important that the app is mobile-responsive. This means it should look great and function well on smartphones and tablets, adjusting its layout and features to fit various screen sizes. The goal is to create a seamless experience for users whether they're on a computer or on the go.

8.2 Data Privacy

The application needs to follow all data privacy laws, particularly the General Data Protection Regulation (GDPR). This means taking extra care in how we collect, store, and manage users' personal information. We should make sure that users know exactly what data we're collecting, why we're collecting it, and how it will be used. It's important to have straightforward consent processes in place so that users can easily agree to share their information or choose to opt out. Regular checks and updates are also necessary to ensure that we're keeping up with privacy standards and that users can trust us to handle their data responsibly. Ultimately, our goal should be to protect users' privacy and build their confidence in our application.

References

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 - Google Maps API. (n.d.). *Google Maps API documentation*. Google Developers.
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