Requirement analysis and specification document

1. Introduction
   1. Description of the problem
   2. Goals
   3. Domain properties
   4. Glossary
   5. Assumptions
   6. Proposed system
   7. Stakeholders
   8. Other considerations
2. Introduction
   1. Description of the problem

PowerEnjoy is a car sharing service that exclusively employs electric cars. The company is in need of a system that allows registered users to find the locations of available cars present in the geographical zones they choose to explore and to complete the reservation of a car from those found with the research tool. Moreover, the system must automatically unlock reserved cars when the customer is nearby, charge expenses on the driver’s count while he or she is on the road, apply discounts and advertise about convenient deals fees according to the customers’ willingness to make his or her part to keep the service efficient for everybody. Since all the vehicles are electric it is fundamental to keep all of them properly charged, so the customers will be incentivized in being virtuous through discounts and penalty fees. A saving option will be provided in order to help customers make the right choices for both save money and help the company maintain its high quality.

* 1. Goals

We can split the goals of the project into two groups: goals regarding the functionalities to be provided to the users and goals regarding the standards to be kept by the system itself.

* + The users should be able to:
    - sign up by providing personal information and a payment method
    - login using the password provided from the system after the sign up
    - find cars located near to them or to a specified address
    - make reservations valid for up to an hour for the cars found through the search engine only if logged
  + The system should act as follow:
    - if a user does not retrieve a car after one hour from the reservation a fee is charged on his or her payment method
    - when a user makes a reservation for a car and is sufficiently near to it, the car is automatically unlocked
    - the cost of a travel is charged real-time on the customer’s payment method and the amount can be seen on a screen in the car
    - safe parking areas are pre-defined and communicated to the customer
    - when a user parks the rented car in a safe area, stops the engine and exits from it, the charge is stopped and the car is locked automatically
    - if the money saving option is activated by the user, the system will give advices to help the driver obtaining discounts based on his or her cooperation in maintaining the quality of the service through a series of good practices
  1. Domain properties

In the following analysis, we keep in account some major characteristics:

* drivers have a proper driving licence
* cars’ GPS cannot be switched off
* accurate cars’ locations are known by GPS
* users who have an opened reservation are properly located by GPS through their mobile devices
* all cars that can be reserved are ready to serve
* a car can be reserved if and only if there are no active reservation for it
* payments are correctly charged at the end of each ride
* the system knows how many passengers are present in each car
* safe parking areas are predefined by the system
* users will never try to accomplish tasks that require more money than those they have charged on their payment method
* each power grid station can be linked to a single car and it is not possible to link different cars to the same power grid station
  1. Glossary

In this paragraph, we go through some recurrent terms that deserve a complete definition to avoid misunderstandings along the discussion:

* GUEST: we use this term when referring to unlogged users. As we stated before, this category of customers can access a limited number of the system’s features, like the research tool. Since unlogged users are not associated with any kind of payment method they can’t make reservations nor access any feature that requires the possibility of online payment.
* USER: as opposed to guests, logged users have access to the full set of features in the system. To access as a logged user a customer must fill the registration form provided by the portal and provide a valid payment method. Every new registration is automatically accepted by the system only after the payment method is verified. When creating a new account, users can set their (unique) username and password, which they will use to access the service as logged users
* DRIVER: logged user that has made the reservation and boarded the chosen car
* CAR: the electric vehicles made available by the company
* POWER GRID STATION: the energy turrets where the users can leave cars to refill their batteries
* SAFE PARKING AREA: a parking area included by the system in a list of “recommendable” places to leave cars at. Safe parking areas are the only places where a car can be left in order to have the system automatically stop charging expenses to the user for the car use
* SPECIAL PARKING AREA: we use this expression to point out a subset of safe parking areas where a power grid station is present
  1. Assumptions

In the following paragraph, we make some assumptions regarding the environment where the described processes take place and the users’ behaviours:

* logged users can make reservations, but everyone can access and surf the list of available cars
* each special parking area is associated to one and only one power grid station
* users will never try to reserve two cars at the same time
  1. Proposed system

The best solution to carry on the project is to develop a web platform, both in the form of a website and of a mobile application. The requisite of portability is fundamental, since one of the wanted features is the that cars should be found opened and ready to serve when they are near enough. A plugin for wearable devices could also serve to this functionality.

* 1. Stakeholders

The one and only stakeholder for this project is represented by the professor who defined the assignment. The deadline for the submission of the complete document is the end of the current semester. The final submission should provide a clear and complete documentation for the development of the system, along with use cases analysis and tests.

The completeness of the document will be compromised by the need of focusing on the major features of the system. Nonetheless we’ll try to maintain a high level of consistency all along the dissertation and to develop as many aspects as possible.

Concerning the target of the application, we can think of the standard user as a stable user: the aim of the system should be to convince the customers to use it more than just once.

* 1. Other considerations about the system

Some considerations based on the last sentence in the previous paragraph can be made. If the aim of the system is to be used daily, a great effort must be spent on the user experience, in particular we require the following characteristics:

* Usability: since the set of functionalities usable by the user is quite limited it should not be difficult to make them so intuitive that no documentation will be necessary to fully understand them at a first glance
* Security: the manipulation of sensible data like payment methods requires a strong focus on security matters and the customers must be aware that they are placing their money in good hands
* Stability: it’s a major characteristic since the service must be available h24 7/7dd
* Look & feel: an essential design is necessary to catch the customers’ attention and bound them to the service