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Requirement Analysis and Specification Document

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1 Introduction

PowerEnJoy is a car-sharing service that exclusively employs electric cars.
Users must have an account on the online platform to be able to access the service. It is possible via the mobile app or directly via a web browser to look for available cars within a certain distance from user current location (possibly tracked by GPS) or from a specified address. Once selected a car the user can book it for up to one hour before the picking up. Rates are calculated based on time spent driving and cars must be parked in pre-defined safe areas, some of which are prepared with power grids.
The management system encourages eco sustainability and best practices with a *bonus-malus* method. For examples there are discounts for car pooling and extra charges for users that park far from power grid stations or leave the battery very low.

1.1 Purpose

PowerEnJoy should provide these functionalities:

G1 Allows visitors to sign up.

G2 Shows updated informations on available cars.

G3 Allows Users to reserve a car.

G4 Allows Users to unlock a car.

G5 Computes the fare.

G6 Rewards well-behaved users.

G7 Allows System Administrator(s) to update informations.

1.2 Scope

1.3 Abbreviations, Definitions and Acronyms

1.3.1 Abbreviations:

- Gn: the n-th Goal
- An: the n-th assumption
- Rn: the n-th Requirement

1.3.2 Acronyms

- CC: Credit Card
- DL: Driving Licence

1.3.3 Definitions

- Visitor: anyone visiting the website without being logged in
- User: anyone who registered on the website
- Active User: a User whose informations (CC, DL) have been verified

1.4 Reference documents

1.5 Overview

2 Overall Description

2.1 Product perspective

2.2 Product funcions

2.3 User characteristics

Everyone with a mobile phone can download and install the app and everyone with an internet connection can access the web app but only visitors with a valid DL can create an account.

2.4 Constraints

2.5 Assunptions and Dependencies

A1 There is a System Administrator that manages the website and the app.

A2 The SysAdmin can add cars to the system and manage them.

A3 There are operators that can recover cars.

A4 Only Active Users can use the service.

A5 Every car has a unique code (different from the licence number) that is visible from the outside. This number is used to ensure that a User is near a Car if he tries to unlock it and no GPS data is available.

A6 The Licence Office (Motorizzazione Civile) allows for automated check of Licence Numbers, also providing checks for Name and Surname (at least).

A7 Foreign Licences are allowed.

2.6 Idea of the implementation

A server will provide business logic and databases, sending dynamic web pages to the web app and anwering the queries coming from the mobile app.
In particular the server and the web app will be implemented in JEE with a SQL relational database. The mobile app will be compatible with both Android and iOS. However other mobile platforms will be able to access services through web browser via the web app, that will have a mobile theme.

3 Specific Requirements

3.1 External Inteface Requirements

3.2 Functional Requirements

3.2.1 G1: Allows visitors to sign up

R1 A valid email is required during the registration.

R2 Invalid emails are all addresses that are either already in use or not well formed.

R3 A valid DL is required.

R4 The DL is valid if all the fields match the user's informations and the Licence Office confirms that the Licence Number, the Name and the Surname are correct.

R5 Foreign DL must be verified by an Operator.

R6 If some of the provided information is incorrect, the registration is rejected and the user is prompted to fix the issue(s).

3.2.2 G2: Shows updated informations on available cars

R7 The list of available cars always includes only cars that are parked and not reserved and is shown on a map in the location where it is actually parked.

R8 If a car is reserved is tagged on the map as "reserved".

R9 For every car is displayed the remaining percentage of the battery.

R10 Users can apply filters to show only cars within a certain distance from a specified location or with a minimum percentage of battery left.

3.2.3 G3: Allows Users to reserve a car

R11 Only Active Users can reserve cars.

R12 Cars can be reserved for up to one hour before the unlocking.

R13 If a reserved car is not unlocked in one hour the reservation expires and the user pays a fine of 1€.

R14 Only available cars can be reserved.

3.2.4 G4: Allows Users to unlock a car

R15 A car can be unlocked only by the user who has reserved it.

R16 There exists a physical mechanism of acknowledgment between the car and the user.

R17 The car is unlocked only after the user is acknowledged.

3.2.5 G5: Computes the fare

3.2.6 G6: Rewards well-behaved users

3.2.7 G7: Allows System Administrator(s) to update informations