***PowerEnjoy***

*Requirement Analysis and Specifications Document*

INTRODUCTION (WIP)

This is the RASD (Requirements Analysis and Specifications Document) of the application

we are going to implement, named PowerEnjoy. It is a car-sharing service based on a mobile application with a single category of end users. The system allows clients to reserve or directly use available electric-powered cars in the area around the user’s GPS position or an address inserted manually. ….

Goals:

* User

(da specifica)

* 1. [G1] - Register to the system
  2. [G2] - Log into the system
  3. [G3] - Look for available cars from the current position
  4. [G4] - Look for available cars from a specific address
  5. [G5] - Reserve car
  6. [G6] - Identify car
  7. [G7] - Drive car
  8. [G8] - Monitor current charging
  9. [G9] - Enable money saving mode
  10. [G10] - Park car
  11. [G11] - Pay ride
  12. [G12] - Ask assistance
* Maintenance Guy
  1. [G13] - Take car of cars

ACTORS

* User:

A User is a potential person who use the application in order to rent an electric car for a limited amount of time and that is in a specific geographical area.

* Maintenance System:

FUNCTIONAL REQUIREMENTS

* User
  1. [G1] - Register to the system
     + The system must receive valid informations of the user (driving license ID, credentials, payment method)
     + The system has to check if the driving license is not registered in the system yet
     + The system must send a password to the user
  2. [G2] - Log into the system
     + The system must check if the password is correct
  3. [G3] - Look for available cars from the current position:
     + The system must be able to determine the user’s position from the GPS of his mobile phone
     + The system must be able to determine which cars are available into a certain distance from the detected position
  4. [G4] - Look for available cars from specific address:
     + The system has to determine if the address provided by user exists
     + The system must be able to determine which cars are available into a certain distance from the specific address
  5. [G5] - Reserve car:
     + The system must show the available cars on the map
     + The system must set the selected car (reserved) as unavailable
  6. [G6] - Identify car
     + The system must receive the plate number of the vehicle to identify it
     + The system must check the identity of the user
  7. [G7] - Drive car
     + If G6 succeeds the system unlocks the identified car
     + The system begins to charge the user as soon as he turns on the engine
  8. [G8] - Monitor current charging
     + The system must show in real time the current charging
  9. [G9] - Enable money saving mode
     + The system must check the correctness of a starting and an ending position
     + The system must calculate the nearest station to the specified ending point where to leave the car
  10. [G10] - Park car
      + The system must stop charging the user
      + The system must lock the car after the user exit from it
  11. [G11] - Pay ride
      + The system must interact with the payment system
  12. [G12] - Ask assistance
* The system must pick up the request of the user and contact the assistance
* Maintenance Guy
  1. [G13] -Take care of cars
     + The system must be able to notify the maintenance guy (low battery, damages)

DOMAIN ASSUMPTIONS:

* The GPS of the cars give always the right position
* The GPS of the cars cannot be switched off
* Cars cannot be stolen or damaged while they are parked
* A user will not carry more passenger than the car’s capacity
* There is at least 1 Special Parking Zone with a free Power Grid available near the destination
* At least 1 maintenance guy will always be available after an assistance request
* A maintenance guy will take care of a request in 1 hour max
* Users will always have enough money on their balance to pay the last ride
* Cars are uniquely identified by license plate (or id number)
* A User who damages a car or makes an accident will take care to call the assistance
* A User will always park the car in a Safe Area
* ~~A client cannot delete a reservation~~

TEXT ASSUMPTIONS:

* Brand new system
* All the clients must be registered and logged in the system in order to always be aware of “who is made what”
* A client that wants to register must have a driving license
* We need informations on a payment method in order to charge the user directly without any intermediate action by him(forse va nei domain)
* The fee in case of a reserved car not reached in 1 hour is of 1 Euro
* We are always able to find all available cars in a specified geographical area
* A client is always able to reserve an available car
* A client is always able to unlock a car and use it if the procedure of identification goes well
* If a car isn’t picked up in 1 hour the system marks it as available again and the reservation expires
* As soon as the engine ignites the system begins to charge the user for a given amount of money per minute
* The user can see in every moment the current charging thanks to a screen on the car
* The system stops charging the user as soon as the car is parked in a safe area and the user exits the car
* The system locks the car automatically
* The set of safe areas for parking cars is pre-­defined by the management system
* The client can always enable the money saving option following the specified procedure

SCENARIO:

1. Aniel see a car and decides to take it. He opens the application and declares to be near the car. He has to identify it with its license plate and the personal password.
2. Giorgio

Scenari possibili prenotazione:

1. La vedo e la identifico utilizzando il numero di targa. A quel punto posso utilizzarla (se non è già stata prenotata).
2. La prenoto dalla app per poterla utilizzare entro 1h (non posso annullare). La macchina diventa unavailable, impedendo di essere utilizzata o prenotata da altre persone
3. La prenoto e scade l’ora: 1 € di multa

Come può finire un viaggio: (sconti non cumulabili, vince il più grande)

1. Luogo idoneo
   1. Parcheggio normale (strisce bianche, blu) senza ricarica
      1. batteria 50%+: 20% sconto
      2. se 3km+ da zona di ricarica || batteria 20%-: +30% su prezzo viaggio (costi ricarica sul luogo)
   2. Parcheggio normale con ricarica (da effettuare dall’utente)
      1. 30% sconto
2. Luogo non idoneo
   1. Parcheggio non consentito (strisce gialle/garage)
   2. Luogo inadatto (strisce, binari, non parcheggi)
   3. Incidente (chiamata al manteinance, cose..)

Come può andare un viaggio (dal punto di vista di chi prenota):

1. Viaggio da solo (o in 2)
2. Viaggio in compagnia e guido io (2+ -> sconto del 10%)
3. Viaggio in compagnia e guida qualcun altro (come sopra ma se succede qualcosa sono affari miei)

In ogni caso l’autista può attivare la money saving mode, inserendo il punto di arrivo in modo che il sistema suggerisca le stazioni di ricarica più vicine al luogo d’arrivo e distribuisca in modo uniforme le macchine.

GLOSSARY

1. **User**: is a potential client of the service;
2. **Username**: the *User* identifies himself in our application providing his email, which is used as *Username*;
3. **Password**: is a string between 6-10 characters chosen by the *User* to log in;
4. **PIN**: is a personal sequence of 4 digits provided by the system to the *User* in order to let him perform a *Car Identification*. The PIN is unique for every *User* and it’s provided once at the end of the registration flow;
5. **Credential**: *Username & Password* to allow the *User to* log in the system;
6. **Payment Information**: are the informations provided by the *User* during the registration in order to let the system charge him for the car sharing;
7. **Position**: it is the position acquired by the GPS. It can be of the *User* and of the *Car*;
8. **Car**: a vehicle that belongs to our system. All the *Cars* are identified by license plate;
9. **Research** **Area**: area in which the system researches available *Cars*;
10. **Reservation**: is a way to book a *Car* for a limited amount of time (one hour) in order to use it. After that amount of time the reservation is no more valid and the *User* needs to pay a *Fee* if the car was not reached;
11. **Car Identification**: it is the procedure that allows the *User* to enter in an available *Car*. To perform the *Car Identification* the *User* needs to identify the vehicle with the licence plate and himself with the personal *PIN*. This procedure doesn’t need the previous *Reservation* of the car;
12. **Fee**: is an overcharge applied by the system to the *User* for some reason;
13. **Discount**: is a percentage to subtract from the last charge in case of virtuous behavior of the *User*;
14. **Charge**: is a variable amount of money that the *User* pay proportionally to the *Ride*;
15. **Safe Area**: is an area in which the *User* is allowed to park the Car;
16. **Special Parking Zone**: is a *Safe Area* in which is located a *Power Grid Station*;
17. **Passenger**: is a person who partecipate to a *Ride* without driving the *Car*;
18. **Battery level**: refers to the residual battery level of the *Car*;
19. **Ride**:it begins when the *User* starts the engine and ends when the *User* turns off the engine;
20. **Power Grid Station**: is a totem that allows the distribution of electric power in order to recharge the battery of a *Car*. It contains a unique *Power Plug* and there is one *Power Grid Station* per *Special Parking Zone*;
21. **Power Plug**: is the part of a *Power Grid Station* that the *User* has to connect to the *Car* in order to recharge the *Battery level*;
22. **Money Saving Mode**: is a special type of *Ride* in which the *User* has to specify ending point so that the system suggests where to park the *Car*. Using that mode a discount will be applied.

CONSTRAINTS

* **Regulatory Policies**:

The system must require the permission of the user to acquire precisely his current position in order to make an accurate research of the available cars. The system must also require the permission for managing sensible data that the user must provide to the system, for example through the insertion of his personal driving licence, in respect to the privacy law. In addition the system must have the permission to send notifications to the user to remind him about important informations (optional). The user must accept the policy document imposed by the system before being registered to it; in this policy document the system specifies in which cases the user has to take his own responsibilities, like in case of an accident or if another person, not registered in the system, drives the car.

* **Hardware Limitation:**
  + in order to use our Mobile Application the user must have a mobile device on which there are:
    - 3G connection always present and persistent;
    - GPS enabled;
    - Enough free space for application apk file installation.
* **Interfaces to other applications**:
  + Must be present an interface with the Push services via APIs in order to send push notifications if desired. For sure we need an interface for each mobile platform (Android iOS and Windows Phone);
  + Interface with e-mail services in order to communicate important informations on the user account, like the personal PIN. (NON SO COME SI INTERFACCI UNA APPLICAZIONE IN RELAZIONE AL SERVIZIO MAIL)
* **Parallel operation:**
  + Our system supports parallel operations from different users managing reservation and unlocking of same car through the use of a general timestamp to solve controversial deriving from nearly contemporaneous requests from different users. (POSSIAMO ANCHE ASSUMERE CHE NON SUCCEDANO)

1. introduction
   1. description of problem
   2. goals
   3. domain properties → ASSUNZIONI FISSE (costruzione realtà) descriptive assertion assume to hold in our world VAGO
   4. glossary→ descrizione entità del sistema (atomi in alloy) e loro attributi
   5. text assumption→ assunzioni derivate dal testo (fisse per tutti) ANIEL
   6. constraints
      1. regular policies→ permessi gps / permission to manage sensible data
      2. hw limitation→ connessione attiva (gps se vuoi essere localizzato)
      3. interfaces to other application→ (push notification) email per registrazione
      4. (parallel operation) MARZO
   7. proposed system→ architecture (#TBD)
   8. identify stakeholders
   9. reference document
2. actor identifying
3. requirements
   1. functional req
   2. (non functional
      1. architectural consideration
      2. documentation)
4. scenario identifying
5. uml models
   1. use case descriptions
   2. class diagram
   3. sequence diagram
   4. activity diagram
   5. state diagram
6. alloy modeling
   1. model
   2. alloy result
   3. world generated
7. future development
8. used tools
9. hours of work
10. changelog

27-10 2.30 (MR)

29-10 2.30 (MRV)

30-10 2.30 (MRV)

2-11 1.00 (MRV)

3-11 3.00(MRV)