



Politecnico di Milano

# RASD - Requirements And Specifications Document

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# Contents

<b>1</b>	<b>Introduction</b>	<b>2</b>
1.1	Problem Definition - PowerEnJoy . . . . .	2
1.2	Goals . . . . .	3
1.3	Glossary . . . . .	4
1.4	Domain Assumptions . . . . .	4
1.5	Constraints . . . . .	4
1.6	Stakeholders . . . . .	4
1.7	Reference Documents . . . . .	4
<b>2</b>	<b>Proposed System</b>	<b>4</b>
<b>3</b>	<b>Actors</b>	<b>5</b>
3.1	User . . . . .	5
3.2	CRM . . . . .	5
<b>4</b>	<b>Requirements</b>	<b>5</b>
<b>5</b>	<b>Scenario Identifying</b>	<b>6</b>
<b>6</b>	<b>UML Modeling</b>	<b>6</b>
<b>7</b>	<b>Alloy Modeling</b>	<b>6</b>
<b>8</b>	<b>Used Tools</b>	<b>7</b>
<b>9</b>	<b>Hours of Work</b>	<b>8</b>

# 1 Introduction

This is the Introduction.

## 1.1 Problem Definition - PowerEnJoy

### TEMP

You are to Develop a digital management system for a Car - sharing service that exclusively employs electric Cars. First, the system should provide the functionality normally provided by Car - sharing services. These include:

- Users must be reliable to register to the system by providing their credentials and payment information. They receive back a password that can be used to access the system.
- Registered Users must be reliable to find the locations of available Cars within a certain distance from their current location or from a specified address.
- Among the Cars available in a certain geographical region, Users must be reliable to reserve a single Car up to one hour before they pick it up.
- If a Car is not picked - up Within one hour from the reservation, the system tags the Car as available again, and the reservation expires; the User pays a fee of 1 EUR.
- A User that reaches a reserved Car must be reliable to tell the system she's nearby, so the system unlocks the Car and the User may enter.
- As soon as the engine ignites, the system starts charging the User for amount of money GIVEN per minute; the User is Notified of the current charges through 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; At this point, the system locks the Car automatically.
- The set of safe parking areas for Cars is pre - defined by the management system.

### TEMP

## 1.2 Goals

- G.1)** First-Time Users must be able to register to the System creating an Account.
- G.2)** Registered Users must be able to login to their Account at any time they want.
- G.3)** A Registered User will be able to make a Reservation of any available Car near his/her current location or from an address that she/he can specify.
- G.4)** Users that had made a Reservation must be able to notify the System when they are nearby the Reserved Car so the system can unlock it.
- G.5)** A User that has made a Reservation must be able to cancel it before 1 hour starting from the time when the Reservation was made.
- G.6)** In case an User hasn't started using the Reserved Car at 45 minutes after the Reservation was made, he/she will be notified that either if the Reservation is not canceled or the Car is not used in 15 minutes, the Reservation will be automatically canceled and a 1 Euro fee will be charged to her/his Account.
- G.7)** When Users that start using their Reserved Car, they must be able to see their current expenses on the service through a System screen inside the Car.
- G.8)** The User must be able to know where the safe parking areas are nearby his/her current location or any address that she/he can specify.
- G.9)** Users must be able to finish their use of the Car when leaving it in a safe parking area and exiting the car. The User will then be charged for the use of the service. The used Car will be locked and freed for Users to be reserved.
- G.10)** The User will always be notified when any Transaction is made on his Account.
- G.11)** Notify the Users that are currently using a Car of any available discounts on their ride if they abide by the 'virtuous behaviour rules' and of the extra fee in case of not respecting the facilitation of the re-charging of the Car on site. These extra discounts/charges will be applied on the Total fee at the end of the ride.

**G.12)** Users can activate the Money Saving option on their Account to be notified of any nearby Re-Charging station on their arrival destination. Leaving the car at the end of the ride t this station and plugging it will register as a 'virtuous behavior' and will apply and extra discount when charging the User.

### **1.3 Glossary**

- **First-Time User:**
- **Registered User:**
- **Account:**
- **Car:**
- **Reservation:**
- **Fee:**
- **Transaction:**
- **Safe Parking Area:**
- **Re-Charging Station:**
- **Virtuous Behavior Rule:**

### **1.4 Domain Assumptions**

### **1.5 Constraints**

### **1.6 Stakeholders**

Our Main Stakeholder is the PowerEnJoy Car-Sharing Service, owned by Prof. DiNitto, that wants a management system for the main functionalities of its service.

### **1.7 Reference Documents**

## **2 Proposed System**

## 3 Actors

### 3.1 User

Is the Main Actor of our service. Any person that once Registered can take advantage of the features of the PowerEnJoy service.

### 3.2 CRM

**TBD** - *we still need to set this actor's goals and requirements.* Customer Relationship Manager, will interface with the User in case of any problem that may arise and can intervene in the System to cancel any Reservation or modify the fee of an User's ride in case of a confirmed major cause.

## 4 Requirements

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**G.2)** Registered Users must be able to login to their Account at any time they want.

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**G.3)** A Registered User will be able to make a Reservation of any available Car near his/her current location or from an address that she/he can specify.

-

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**G.9)** Users must be able to finish their use of the Car when leaving it in a safe parking area and exiting the car. The User will then be charged for the use of the service. The used Car will be locked and freed for Users to be reserved.

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**G.11)** Notify the Users that are currently using a Car of any available discounts on their ride if they abide by the 'virtuous behaviour rules' and of the extra fee in case of not respecting the facilitation of the re-charging of the Car on site. These extra discounts/charges will be applied on the Total fee at the end of the ride.

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**G.12)** Users can activate the Money Saving option on their Account to be notified of any nearby Re-Charging station on their arrival destination. Leaving the car at the end of the ride t this station and plugging it will register as a 'virtuous behavior' and will apply and extra discount when charging the User.

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## **5 Scenario Identifying**

## **6 UML Modeling**

## **7 Alloy Modeling**

## 8 Used Tools

The Tools used to develop this RASD document were:

- **GitHub:** for Version Control
- **Alloy Analyzer 4.2:** for Alloy Modelling and proving consistency
- **TeXworks:** for LaTeX editing of this Document



## 9 Hours of Work

Date	Domenico	Caio	Matheus
25/10/16	30m	30m	30m
26/10/16	1h	-	-
27/10/16	-	-	-
28/10/16	2h.30m	4h.30m	4h.30m
29/10/16			
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02/11/16			
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