

RASD - SOFTWARE ENGINEERING 2



**POLITECNICO**  
**MILANO 1863**

PowerEnjoy

Marini Alberto	Marrone Matteo
862838	810840
alberto2.marini@mail.polimi.it	matteo.marrone@mail.polimi.it
Sabatelli Antonella	
875666	
antonella.sabatelli@mail.polimi.it	

November 13th, 2016

*Politecnico di Milano*

## Contents

<b>1</b>	<b>Introduction</b>	<b>3</b>
1.1	Purpose . . . . .	3
1.2	Scope . . . . .	3
1.3	Actors . . . . .	3
1.4	Goals . . . . .	4
1.5	Definitions, Acronyms, Abbreviations . . . . .	5
1.5.1	Definitions . . . . .	5
1.5.2	Acronyms . . . . .	5
1.5.3	Abbreviations . . . . .	6
1.6	Reference Documents . . . . .	6
1.7	Document overview . . . . .	6

# Chapter 1

## 1 Introduction

### 1.1 Purpose

This document contains the **RASD** (*Requirement Analysis and Specification Document*), aimed to describe a car sharing system named PowerEnjoy which only employs electric cars, supposing no previous software infrastructure exists. Conforming to the *IEEE-STD-830-1993* standard for RASD documentation this will include an overview of the functional and the non functional requirements of the system, showing the constraints and the limit of the software and simulating typical post-development scenarios through corresponding use cases.

This document is intended to all developer and programmer who have to implement the requirements, to system analyst who want to integrate other system with this one, as well as for stakeholders interested in learning how the developed solution matches their request.

### 1.2 Scope

The project is aimed at creating a product that will allow end users to rent electric cars for any amount of time. Generic users should be able to register to the system by providing their credentials and payment information, receiving at the end of the process a password usable to access the system. Once accessed, the system should point the users the locations of nearby cars, that they'll be able to reserve for up to one hour before the estimated pickup time. Once arrived on the site where the car is parked within the allotted time, a user should be able to prove its identity as the booker of the car, which would then be unlocked. The user should be charged while driving, in proportion to the time spent driving, until the car is parked in a safe area, whose set is pre-defined by the system. Once the user is out of the car, the system would lock the car which would then be ready to be used by another user.

In case of expiration of the reservation, the user is charged of a pre-determined fee. Economical incentives and penalties should be awarded in proportion to how eco friendly the user's behaviour has been.

### 1.3 Actors

- **Guest:** a guest is a user who has yet to join the service; as such, it can only consult the information regarding the service available on

the homepage and navigate between it and the registration and the login pages. To become a registered user the guest will have to fill in a registration form and provide payment method data as well as a photo of its driving license; the system will then analyze the data and confirm the success of the registration process within 3 days.

- **Registered user:** a registered user is able to log in.
- **Logged-In User:** a user allowed to make and ( within 15 minutes from its making) cancel a reservation for a car, possibly after the visualization of the nearby cars and the safe areas close to the destination. After the reservation it will be enabled to open the reserved car.
- **Car AI:** through its sensors, the car detects information regarding the ride that will be sent to the system, unlocks and locks itself and displays to the user infos about the surrounding area.
- **Power Enjoy System:** the Power Enjoy System primarily keeps a record of the users, the cars, reservations updating the status of each of them according to the input from the users and the cars AIs. It also calculates the price for each ride and coordinates itself with payment systems interfaces to finalize money transfers, and warns the staff about exceptional situations such as ones where a car has been damaged, or abandoned in a discharged state.

## 1.4 Goals

List of the goals of PowerEnjoy application:

- [G0] Allow a visitor to visualise information regarding the service and become a registered user.
- [G1] Allow a registered user to log in.
- [G2] Allow logged in user to check the location of nearby cars.
- [G3] Allow logged in user to reserve a car.
- [G4] Allow logged in user to cancel its reservation until 15 minutes from the reservation time.
- [G5] Allow logged in user to open the car reserved.
- [G6] Allow logged in user to report damage to the car reserved.
- [G7] Allow logged in user to enable money saving option when in the car.
- [G8] Allow logged in user to check the log of its previous transactions.

- [G9] Allow logged in user to check the location of the safe areas.
- [G10] The application will display from the inside of the car the amount of money charged at any time.
- [G11] The application will inform the user of any discount/penalty applied at the end of the ride.

## 1.5 Definitions, Acronyms, Abbreviations

### 1.5.1 Definitions

- **Pairing Code:** A code provided to the portable device by the system after the reservation, to be used to open the car exploiting bluetooth technology. When the car is reached by the user its portable device and the car join what is called a trusted pair through a discovery and authentication process where the matching of the code in possession of car and device is verified, and at the end of the process the car opens.
- **Blocked User:** a registered user who is able to access the service yet unable to reserve a car since the money transfer related to the last transaction failed.
- **Safe Area:** An area where the car can be parked without being subject to further time-based charging. It corresponds to a collections of parking spots in the city of Milan reserved by the service for the users.
- **Grid Station:** An area where it is possible to plug an electric car.

### 1.5.2 Acronyms

- **RASD:** Requirements Analysis and Specication Document
- **DB:** DataBase
- **DBMS:** DataBase management system
- **API:** Application Programming Interface
- **OS:** Operating System
- **JVM:** Java Virtual Machine
- **JEE:** Java Enterprise Edition
- **AI:** Artificial Intelligence
- **GPS:**Global Positioning System
- **MB:** Megabyte

### 1.5.3 Abbreviations

## 1.6 Reference Documents

- Assignment document: AA 2016-2017 Software Engineering 2 -Project goal, schedule, and rules
- SO/IEC/ IEEE Std 29148:2011(E) Systems and software engineering - Life cycle processes - Requirements engineering

## 1.7 Document overview

This document is divided in four sections:

- Section 1: Introduction, it consists of a generic introduction of the document aimed at providing the basic info necessary for the comprehension of the other sections contents.
- Section 2: Overall Description, gives general information about the software product with a special focus on constraints and assumptions.
- Section 3: Specific requirements, this part mainly includes different representations of functional requirements and also nonfunctional requirements.
- Section 4: Appendix, it contains a modelization of the requirements created by using alloy language.