RASD

Patricia Abbud
Maddalena Andreoli Andreoni
Paolo Cudrano

Contents

1 Introduction

1.1 Description of the given problem

The system we are going to develop is a carsharing service called *PowerEnJoy*. The system allows registered users to locate and reserve a car to use.

1.2 Goals

- **G1** The system charges the user for a predefined amount of money per minute.
- **G2** The system starts charging the user as soon as the car ignites.
- **G3** The system stops charging the user when the car is parked in a safe area and the user exits the car. The user must confirm the operation, otherwise the system keeps charging them.
- **G4** A screen on the car notifies the user of the current charges.
- **G5** The system locks the car automatically when the user exits the car.
- **G6** The system allows the user to open the car through a bluetooth system when the user has reserved it.
- **G8** If the user has chosen to keep being charged, the system allows them to exit and close and re-open the car through a bluetooth system.
- **G9** If the user has chosen to stop being charged, the system keeps a 10minutes window of time when they are allowed to re-open the car if it has not already been reserved by someone else.
- **G10** The set of safe parking areas is predefined by the management system.
- **G11** The system allows the user to earn a 10% discount on the current ride if there are at least two other passengers in the car.

1.3 Domain properties

We assume that the following properties hold in the analyzed world:

- All cars are equipped and located with a GPS system.
- All the GPS always give the right position.
- The GPS system cannot be switched off.
- All cars are equipped with a Bluetooth system.
- The Bluetooth system is always on.

- The user is always able to be located, either by GPS or by giving their position themselves.
- The safe areas are predefined and within the municipality of Milan.
- The payment of all services is always accepted.
- The cars always ignite when they are charged
- The cars cannot be reserved by more than one user at any given time.
- The system is always able to tell how many people occupy a car.

1.4 Glossary

User We will refer to all people who are registered to the system as 'users'. All users have personal profiles which contain the following information:

- First name;
- Family name;
- Email;
- Username;
- Password;
- Payment information; this in particular includes
  - Credit card number;
  - Credit card expiration date;
  - CVV number.

  And, optionally:
- Personal photo;
- Telephone number.

Users should be able to locate, reserve and drive the cars offered by the service.

Guest We shall call 'guests' all people who are using the interface of the system without being registered or logged in. Guests can't access any functionality of *PowerEnJoy* except for the registration process or the log in.

Safe areas are predefined parking slots within the municipality.

Recharging areas are parking slots where the car can be recharged; safe areas and recharging areas do not always coincide

Reservation We will call 'reservation' the operation of booking a specific car for the sole use of the user who reserved it. Reservations allow the users to access the car, open it and drive it.

Power grid

1.5 Assumptions

1.6 Constrains

1.7 Proposed system

1.8 Identifying Stakeholders

1.9 Reference documents

2 Actors Identifying

3 Requirements

4 Scenario identifying

5 UML models

6 Alloy modeling

7 Appendix

List of Figures

List of Tables

7.1 Used tools

For this assignment, we used the following tools:

LaTeX The group used LaTeX to structure the final document and to help with versioning.

Github We leaned on Github for versioning and coordinating synchronized work.

Toggl We used toggl to keep track of work hours.

Alloy

7.2 Hours of work