

Safestreet

Requirement analysis and Specification Document

October 10, 2019

Edoardo Putti



Table of Contents

[I. Introduction 3](#_Toc23345126)

[1.1 Purpose 3](#_Toc23345127)

[1.2 Scope 3](#_Toc23345128)

[1.3 Definitions, Acronyms, Abbreviations 4](#_Toc23345129)

[1.4 Revision History 5](#_Toc23345130)

[1.5 Reference Documents 5](#_Toc23345131)

[1.6 Document Structure 5](#_Toc23345132)

[II. Overall Description 6](#_Toc23345133)

[II.1 Product Perspective 6](#_Toc23345134)

[II.2 Product Functions 6](#_Toc23345135)

[II.3 User Characteristics 6](#_Toc23345136)

[II.4 Assumptions, Dependencies and Constraints 6](#_Toc23345137)

[III. Specific Requirements 6](#_Toc23345138)

[III.1 External Interface Requirements 6](#_Toc23345139)

[III.1.1 User Interfaces 6](#_Toc23345140)

[III.1.2 Hardware Interfaces 6](#_Toc23345141)

[III.1.3 Software Interfaces 6](#_Toc23345142)

[III.1.4 Communication Interfaces 6](#_Toc23345143)

[III.2 Functional Requirements 6](#_Toc23345144)

[III.3 Performance Requirements 6](#_Toc23345145)

[III.4 Design Constraints 6](#_Toc23345146)

[III.4.1 Standards Compliance 6](#_Toc23345147)

[III.4.2 Hardware Limitations 6](#_Toc23345148)

[III.4.3 Any Other Constraint 6](#_Toc23345149)

[III.5 Software System Attributes 6](#_Toc23345150)

[III.5.1 Reliability 6](#_Toc23345151)

[III.5.2 Availability 6](#_Toc23345152)

[III.5.3 Security 6](#_Toc23345153)

[III.5.4 Maintainability 6](#_Toc23345154)

[III.5.5 Portability 6](#_Toc23345155)

[IV. Formal Analysis Using Alloy 7](#_Toc23345156)

[V. Effort Spent 7](#_Toc23345157)

[VI. References 7](#_Toc23345158)

1. Introduction

## Purpose

This document is the Requirement Analysis and specification Document (RASD) for the Safestreet application. Its aim to inform about what the application offers, about requirements and goals that the system must present. This document offers also an analysis of the world and shared phenomena regarding Safestreet. RASD contains class diagram to show domain models and other diagrams which illustrate, with more details, transaction of the functionalities of the application.

## Scope

Safestreet is a crowd-sourced application that allows people to send reports about traffic violations by registering them into the application. A person become a user of Safestreet by registering himself to the app. After this phase, users can start to use basic functionalities of the app (e.g. sending reports and querying the application). Safestreet allows, also, to the authorities to register, log in and use advance functionalities of the app.

The app allows users to send reports to the authorities and querying the app for traffic and violations highlights. The goal of Safestreet is to send the reports to the authorities helping them with their job adding to the reports useful information (geographical position and pictures).

When a user creates a new report, he can add a picture of the car plate so that the app can extrapolate the car plate id; user can also add the geographical position of the violation and of course the type and timing of traffic violations occurred. Moreover users are allowed to visualize traffic highlights using the app.

The app allows authorities to receive traffic violations reports and querying the app for valuable data.

The system interfaces with other firms (e.g. municipality services, territory maps companies) to offer a more comprehensive user experience.

---------------------------------------------------------------------------------------------------------cut below---------------

Safestreet is a crowd-sourced application that intends to provide users with the possibility to notify authorities when traffic violations occur. In particular the application allow users to send picture of traffic violation with their geographical position and a description of the violation. The violation are send by the application to the authorities that take the right measures. Thanks to the system the work of the authorities is simplified because common user add valuable information such as:

* Geographical position
* Plate number (not mandatory)
* Type of violation
* Date and time

In addition the application permit, for all type of users, the mining of the information such as:

* Area in which there is currently a car accident
* Area with high traffic density

Authorities can also access to more detailed data such as:

* Number of violation committed by a car
* Area with high frequency of violations

The safestreet service is offered to common users that wants to help the authorities reporting traffic violations (type of violation and location). It is thought for the authorities control all the violations that occurs and take actions, so they need to be supported by the user through the service, that stands in the middle.

A picture containing vector graphics

Description automatically generated  

The software to be (from now on S2B) give the user the possibility to send pictures of traffic violations, and other data such as date and time, car’s plate (not mandatory) and geographical position. The system will also allow the user to choose which data to send and which not. Safestreet offers, also, to the user to consult their reports and highlights on traffic and car accident. It is assumed that the user has a device with the capacity to acquire the necessary data (camera + GPS); if some of this device are not present, the data cannot be acquire. The authorities can access to all the reports and highlights on violation density logging in and querying the Safestreet platform (both users and authorities have to register to the system first). The system relies on the fact that all the users can be identified with an unique key (their fiscal code) and so the authorities can know who sent the violations. Authorities can request to the system to retrieve violations or ask for aggregate data on the base of reported violations. The aggregate requests are handled directly by Safestreet. **to be review and make additions…**

**1.2.1 Goals**

[G1]: Users should be able to send reports regarding traffic violations.

[G1]#1 specify traffic violation type

[G1]#2 attach a picture of the car plate

[G1]#3 include the geographical position

[G2]: Authorities should be able to access the reports.

[G3]: customers should be able to access to different kind of information depending on their role.

[G3]#1 users can access only to traffic highlights, and their reports

[G3]#2 authorities can access to traffic highlights, violation statistics, and all the reports

[G4]: users should be able to add useful information to the report ---is it necessary?

[G5]: The application allows communication with the municipality services

## Definitions, Acronyms, Abbreviations

1. Definitions

Here we provide a list of definitions of words and expressions used in the documents.

* **Users**: the “normal” customer of the application that exploits the application only to send traffic violations and to retrieve information from it.
* **Authorities**: the customer of the application that exploits it to monitor the violations and take adequate measures.
* **Customer:** general safestreet customer, can be an authority or a user
* **Report:** a module reporting a traffic violations containing useful data
* **Traffic violations:** violation of the laws that regulate vehicle operation on streets and highways

1. Acronyms

* API = Application Programming Interface
* GPS = Global Positioning System
* UI = User Interface
* S2B = Software To Be

1. Abbreviations

* Gn = nth goal
* Dn = nth domain assumption
* Rn = nth requirement

## Revision History

* Version 1.0:
  + First release

## Reference Documents

* IEEE std 830-1998 IEEE Recommended Practice for Software Requirements Specifications
* Specification document: Safestreet Mandatory project Assignment
* UML diagrams: <https://www.uml-diagrams.org/>
* Alloy doc: <http://alloy.lcs.mit.edu/alloy/documentation.html>

## Document Structure

The RASD document is composed of five chapters, as outlined below:

**Chapter 1** contains an introduction, that describes the purpose of the system informally. Furthermore there is a list of goals that the application has to reach. It is also defined the scope and the aim of the system in great detail. Moreover it show a clear report of the world and shared phenomena (**To do W&S…**)

**Chapter 2** (**To do…**)

**Chapter 3** (**To do…**)

**Chapter 4** (**To do…**)

**Chapter 5** (**To do…**)

1. Overall Description

## Product Perspective

## Product Functions

## User Characteristics

## Assumptions, Dependencies and Constraints

1. Specific Requirements

## External Interface Requirements

### User Interfaces

### Hardware Interfaces

### Software Interfaces

### Communication Interfaces

## Functional Requirements

## Performance Requirements

## Design Constraints

### Standards Compliance

### Hardware Limitations

### Any Other Constraint

## Software System Attributes

### Reliability

### Availability

### Security

### Maintainability

### Portability

1. Formal Analysis Using Alloy
2. Effort Spent
3. References