POLITECNICO
MILANO 1863

SafeStreets

Requirements Analysis and Specification Document

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Contents

1 INTRODUCTION

1.1 Purpose

This document will contain the `Requirements Analysis and Specification Document` for SafeStreets, a crowd-sourced application that will allow users to notify traffic violations to authorities, and authorities themselves to simplify the process of enforcing laws for these offences through a data mining system.

1.2 Scope

The software will be dedicated to civilians and authorities: through a mobile application, civilians will have the possibility to report a violation by submitting pictures, position, date and the license plate of the offender to the authorities in an effort to improve their communities, while officers can use the data mining system to facilitate the process of law enforcement. Authorities will be supplied with a web application with the ability to confirm the officers' accounts or add new officers, and will be supported with a data mining system to highlight areas with high violation frequency, repeated offenders, and signal to the officers an offence to direct them. A data warehouse will be thus implemented, and repeated reports of violations could also lead to automated traffic tickets being released at the discretion of the authorities. A two agent authentication will be used to verify the officers' identity: either the officer subscribes and is verified by his authority, or the authority adds the officer, who is sent a verification code through e-mail.

1.2.1 Goals

- Allow future users to easily register and login.
- Allow users to notify authorities of traffic violations through the use of the camera.
- Store relevant info about the violation in the data warehouse.
- Allow only authorities to visualize relevant data for law enforcement purposes.
- Implement optionally usable functionality for automated traffic ticket compilation and sending.
- Guarantee privacy to both civilians and authorities.

- Guarantee security:
  - discard and discourage false reports;
  - block unauthentic officer registrations;
  - only allow authorities to visualize processed data helpful for law enforcement.

1.3 Definitions, Acronyms, Abbreviations

1.4 Revision history

1.5 Reference Documents

1.6 Document Structure

2 OVERALL DESCRIPTION

2.1 Product perspective: here we include further details on the shared phenomena and a domain model (class diagrams and statecharts)

2.2 Product functions

The goals to be accomplished require the following functions:

- `Registration and login management:` while civilians will be able to register and login in standard fashion, officers will be confirmed by their corresponding authorities after sending their identification, or authorities will add them prompting an automatic message containing a confirmation number which will be used by the officers.
- `Violation reporting:` allow users to send various pictures representing the offence with the corresponding date and location (both manually and via GPS) to the authority which will process them.
- `Data storage, mining and visualization:` store all the relevent data from the reporting procedure to process it through ETL and present it to the authority to assist them in law enforcement.
- `Automated ticket emission:` at the discretion of authorities and in the presence of multiple reports of the same violation, a traffic ticket can be automatically compiled by this function and sent to the offender.

2.3 User characteristics

- `Civilians:` users unaffiliated to law enforcement authorities who are interested in improving their community, they are only able to report violations but don't have access to mined data. They're required to login so they can eventually be excluded in case of security violations (like sending false reports).

- `Officers:` they're registered through their authority listing them through the web application and receiving a confirmation number, or by themselves and later being confirmed by the authority. They're both able to see the mined data and to report violations.

- `Authority:` they're manually registered through SafeStreets employees and their work is managed in office through a web application. They can add new officers or confirm self-registered ones, and they're able to see the processed data and enable automatic ticket emission.

2.4 Assumptions, dependencies and constraints: here we include domain assumptions

3 SPECIFIC REQUIREMENTS: Here we include more details on all aspects in Section 2 if they can be useful for the development team

3.1 External Interface Requirements

3.1.1 User Interfaces

3.1.2 Hardware Interfaces

3.1.3 Software Interfaces

3.1.4 Communication Interfaces

3.2 Functional Requirements: Definition of use case diagrams, use cases and associated sequence/activity diagrams, and mapping on requirements

3.3 Performance Requirements

3.4 Design Constraints

3.4.1 Standards compliance

3.4.2 Hardware limitations

3.4.3 Any other constraint

3.5 Software System Attributes

3.5.1 Reliability

The system must always be online and ready to process requests and load them into the data warehouse.

3.5.2 Availability

As many requests as possible should be processed, but it is not vital that everyone of them is.

3.5.3 Security

3.5.4 Maintainability

3.5.5 Portability

4 FORMAL ANALYSIS USING ALLOY: This section should include a brief presentation of the main objectives driving the formal modeling activity, as well as a description of the model itself, what can be proved with it, and why what is proved is important given the problem at hand. To show the soundness and correctness of the model, this section can show some worlds obtained by running it, and/or the results of the checks performed on meaningful assertions

5 EFFORT SPENT

- Davide Cocco

Day	Subject	Hours
15/10/2019	Purpose, Scope, Goals, Product functions, User charateristics	2.5
Total		**

- Marco Gasperini

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15/10/2019	Purpose, Scope, Goals, Product functions, User charateristics	2.5
Total		**

6 REFERENCES