Goals:

1. The system allows authenticated users to report parking violations occurring in the streets (missing parking disk, not paid parking meter, illegally parked vehicles).
   1. The system must collect the current position of the user, using GPS
   2. While reporting the violation, the system must allow users to take one or more pictures of the potential violation
   3. As input to the system, the client must select the type of violation detected and can indicate the license plate
   4. The system must not allow users to choose pictures not taken in the moment of the report
   5. The system must allow user to confirm or delete the current report
   6. After confirmation, the system must add the current date and time to the report and must generate the digital signature //TODO
   7. ~~The system must allow confirmed report to be sent to the server~~ The user side application must send to the central system the confirmed reports
2. Municipalities must be notified about potential violations, which are reported in their area of interest and are used to generate traffic tickets.
   1. The system must check reports to try to find if the pictures of the violations have been modified
   2. The system must try find, according to the GPS position of the user and the pictures sent, if the position is fake or not
   3. The system must discard the report if recognized as fake
   4. The system must store the reported violation if correct
   5. The system will run an algorithm to automatically recognize the license plate, possibly helped by the user input
   6. The involved municipality must be calculated considering in which city the reported violation has been found, based on the GPS of the client that has sent the report
   7. The system must send the reported violation to the involved municipality
3. The system allows users to register and log in in the application.
   1. The application must ask for credentials (Username and Password) when logging in
   2. The application accepts and completes the login only if the credentials are correct
   3. To register a new user the application must ask for the Username, Password, name, surname, birth date, Identity Card number and Fiscal Code.
   4. The system permits the registration only if: Username, Identity Card Number and Fiscal Code are valid, they are not associated with any other users.
   5. The system retrieves information about the user from the Identity Card number and permits the registration only if name, surname and birth month are equal to inserted ones.
   6. The system denies registration if any of the previous requirements are not satisfied.
4. The system allows authenticated authorities to log in in the application trough credentials previously manually inserted in the system and distributed to authorities through a different channel.
   1. The system provides a new unique Username and an associated Password to every autorithy user
   2. The system allow authorities users to login in if they insert their correct username and password.
5. The system allows authenticated municipalities to retrieve information from Safe Streets about the reported violations.
   1. The system must allow municipality agent and supervisors to access only to information about their own area of interest.
   2. The system must show to the logged agents the reported notification which has been sent to their municipality
6. The system allows users to retrieve information about streets or areas with the highest frequency of violations with or without authentication.
   1. The system must mine information from the reported violations
   2. The system must allow the user to select a city for the statistics. The user can choose either the city where he is, using the GPS position, or an arbitrary selected location
   3. The system must allow the user to select information about streets or areas in the city selected
   4. The system must show the statistics about violations according to the selected parameters.
7. The system allows authorities to retrieve information about streets or areas with the highest frequency of violations
   1. See 6.1
   3. The system must allow the user to select information about streets or areas in the city selected
8. The system allows authorities to retrieve information about the vehicles with the most violations.
9. The system allows to suggest the municipalities for possible interventions about the mostly unsafe areas //ci pensiamo
   1. The system must take information from the municipality exploiting the municipality services
   2. The system must elaborate this information and try to find possible solutions for problems
   3. The system must notify the municipalities about the solution it has found
10. The system allows users to retrieve statistics and trends about violations: information concern the effectiveness of SafeStreet initiative, issuing of traffic tickets
    1. The system must take information from the municipality exploiting the municipality service
    2. The system must use this information to build statistics
    3. The system must not allow user to see confidential data about other people
    4. The system must allow the client to choose the topic he’s interested in
    5. The system must show to the user the topic selected
11. The system allows municipalities to retrieve statistics and trends about violations: information concern the effectiveness of SafeStreet initiative, issues of traffic tickets and most egregious offenders.
    1. The system must

Requirements:

UML

SEQUENCE DIAGRAM

USE CASE

Scenario

1.Reports a violation

Mark is a man in his thirties. He’s an employee at Esselunga supermarkets. One day, walking down the main street of his city he finds a car parked illegally in the middle of the bike lane. Mark is registered in the application SafeStreet. He takes out his smartphone and opens the application. After writing his credentials and logging in, he clicks the button “Report a violation” in the home page. He inserts the type of violation, so in this case he just writes “car illegally parked in bike lane”, and takes three different pictures of the car: one of the front of the car, clearly showing the license plate; the second showing the entire car and, in the background, the signal of bike lane; the third one highlighting important elements of the streets where the potential violation occured, to help the matching of the photo with the GPS position of the user. He then confirm clicking on the “Confirm” button. The potential violation is now sent to the server for a verification. Finally, he closes the application and continues his walk.

2.The policeman receives a notification

3. Checks for unsafe streets in his zone

Bob is a curious user that has the SafeStreet application installed in his iPhone 8 but is not registered in the SafeStreet database. One day, he witnesses an accident in the streets while driving his car, where a car runs over a biker correctly biking in his bike lane.

As he goes home, he’s curious about the most dangerous and unsafe areas and streets in his city and he wants to if the street where he saw the accident is one of them. He opens the SafeStreet application and clicks the button “Check statistics in a city”. After this, a new page opens in which Bob clicks on the “Check for most dangerous areas/streets”. The last click he does is on the “Search for a city using your GPS position” button. Now the screen shows a map with highlighted the most unsafe areas (with most accidents) in his city. Bob selects then the area is interested in and sees what are the most dangerous streets in the area. Bob discovers that the street he was searching for is the most dangerous one. Finally, Bob closes the application.

4. Needs to travel and searchs for safe places for a car

Marie is a woman who often travels for work. She tipically travels by car. She lives in Milan and this week she needs to go to Turin. He wants to know where she can safely park the car and take an hotel reservation. Before searching for an hotel, she takes out her Huawei and opens the SafeStreet application. She clicks the button “Check statistics in a city”. After this, a new page opens in which Bob clicks on the “Check for most dangerous areas/streets”. The last click he does is on the “Select a city you want” button. She chooses “Turin” among all the possible ones. Now she can use infos found to look for safe zones near her workplace.

5. New intervention in an unsafe street

6.the user registers to the application

Luke and Walter are two close friends. Luke doesn’t know about SafeStreet application while Walter is a regular registered user of it. One day, Walter and Luke are walking down a road. Walter notices a potential violation and stops. He takes out his phone and opens the SafeStreet application. Luke asks Walter what he’s doing and Walter explains what SafeStreet is. Walter is pretty convincing and makes Luke install the application. Luke learns that to report violations he need to register. So he starts the process of registration providing his name, surname, birthdate, fiscal code and number of the identity card. After this, he creates his own unique username and the password. On screen, Luke sees that the registration has been successful.

Common hours: 1 h

Requirements, goal and domain assumption: 5 h

Scenarios: 1 h