Design Document

Matteo Greselin - Matr. 862908

Version 1.0

Contents

1 Introduction **3**
1.1 Purpose and Scope . . . 3
1.2 Glossary . . . 3
1.3 Reference Documents . . . 4
1.4 Document Structure . . . 4

2 Architectural Design **5**
2.1 System Components . . . 5
2.1.1 Model Module . . . 5
2.1.1.1 Account And Data Handler . . . 5
2.1.1.2 Events Handler . . . 5
2.1.1.3 Help Request Handler . . . 6
2.1.1.4 Map Handler . . . 6
2.1.1.5 Notification Handler . . . 6
2.1.1.6 Parking Handler . . . 6
2.1.1.7 Pollution Handler . . . 6
2.1.1.8 Pubblic Transport Handler . . . 7
2.1.1.9 Queue Handler . . . 7
2.1.1.10 Traffic Handler . . . 7
2.1.2 View Moduel . . . 7
2.1.2.1 Guest View . . . 7
2.1.2.2 User View . . . 8
2.2.2.3 City Administration View . . . 8
2.1.2.4 Hospital View . . . 8
2.1.2.5 Police Station and Fire Fighters Station View . . . 8
2.1.2.6 Public Transport Company View . . . 8
2.1.3 Control Module . . . 9
2.2 Component View . . . 9
2.3 Deployment View . . . 11
2.4 Runtime View . . . 11
2.4.1 Traffic Managing Runtime . . . 12
2.4.2 New Event Scheduling Runtime . . . 13
2.4.3 New Help Request Runtime . . . 14

2.5 Component Interface 15
2.5.1 Account And Data Situation Handler 15
2.5.2 Events Handler 16
2.5.3 Help Requests Handler 16
2.5.4 Map Handler 16
2.5.5 Notifications Handler 16
2.5.6 Parking Handler 17
2.5.7 Pollution Handler 17
2.5.8 Public Transport Handler 17
2.5.9 Queue Handler 17
2.5.10 Traffic Handler 17
2.6 Other Design Choises 18

3.Algorithms Design **19**
3.1 Queue Algorithms 19
3.2 New Help Request Algorithms 19
3.3 Traffic Managing Algorithms 20
3.4 Car Parks Reservation Algorithms 21

4.User Interface Design **22**
4.1 Guest Experience 22
4.2 User Experience 25
4.3 Superuser Experience 27
4.3.1 City Administration 27
4.3.2 Hospital 28
4.3.3 Police Stations and Fire Fighters Stations 29
4.3.4 Public Transport Company 30

5. Requirements Traceability **32**
5.1 Sign Up 32
5.2 Types of Possible Log In And Functionalities 32
5.2.1 Log In 32
5.2.2 Profile Managing 32
5.2.3 Administation Functionalities 33
5.2.4 Hospital Functionalities 33
5.2.5 Public Transport Company Functionalities 34
5.2.6 Police Station And Fire Fighters Station Functionalities 34
5.2.7 Guests and Users Funcitonalities 35

6.Used Tools and Work Timing **36**

1 Introduction

1.1 Purpose and Scope

This document is required in order to provide more details about the application design : which components are necessary, which architecture has been choosen and why, how components are integrated each other, which should be the interface that i want propose to guest/user and so on. For bring out these things, DD will use what has been described in the RASD document: this means that there is a strictly relation between what are the application requirement and which choises will be done.
I will use graphical way for explain my decision and, for sequence diagrame in real time view, will be done an updating of those rappresented in the RASD.

SmartCityAdvisor will be an application client/server based. This mean that on he client evice will be provide only the interface (the view) in order to allow the access to functionalities that will be on the server side. With this choise i want to extend the usage of application becouse it reduces constraint releated to device hardware specification. The application will be also able to run on each type of OS, both for smartphone that for PC desktop. In order to reach functionalities, userd needs to have a permanent internet connection : this will allows to syncronize information between client side and server side, when required.

1.3 Definitions, Acronyms, Abbreviations

- RASD: Requirements Specication Analysis Document
- DD: Design Document
- MVC: Model Control View
- FIFO: First In First Out, it's a policy applied to the queue managing.
- PaaS: Platform As A Service

- SOA: Service Oriented Architecture
- DB: DataBase
- DBMS : Data Base Management System
- JEE : Java Enterprise Edition

1.5 Reference Documents

In this document we refer to following documentation:

- IEEE Std 1016-2009 (Revision of IEEE Std 1016-1998), Standard for Information Technology Systems, Design Software, Design Descriptions
- International Standard ISO/IEC/IEE 42010 - First edition 2011-12-01 - Systems and software engineering Architecture Description
- Template For The Design Document provided by prof. Di Nitto
- RASD of smartiCityAdvisor® created me

1.4 Document Structure

The document will be structured in 6 chapter. After this one, that is an introduction chapter, the document will be structured as following:

- In the second chapter there will be the architectural design, with a detailed description about componets that will interact in order to perfom the service
- In the third chapter i will bring out some of main algoritms that the system will manage. This section will be done using pseudocode and diagrams
- In the fourth chapter will be presented a grafical explanation abount experience of application usage
- Fifth and sixth chapter will be conclusions and requirements traceability

2 Architectural Design

In the next sections will be explained all choise about archirectural decision. I will describe components, their integration in the system and how they will interact between them. A section will be dedicated to more algorithmic parts of system as traffic situation or parking reservation; for these parts will be used pseudocode in order to allow to each reader to understand the system that i want propose, without the necessity of informatic knowledge.

2.1 System Components

The idea is to use the pattern Model - View - Controller, in the following subsection will be present main modules of each component.

- In the model there will be all the handlers (for the queue, for the traffic situation, for the account...)
- The controller will have the task to forward information between view and model, in realtion with the type of account
- The view will differenciate what each person could see on his device, with respect to the type of log in, if it has been done, otherwise will be proposed guest view ad default view)

2.2.1 Model Module

2.2.1.5 Account And Data Handler

THIS is the main handler: it is directly connected with DB and for this reason each action that willl required an access to DB will be interfaced with this handler. It manage data and user accounts and this includes also the functionality 'profile managing'. This handler will be used also as final protection against attacks versus DB.

2.1.1.2 Events Handler

TO this handler could have access the City Administration with privileges, in order to add/remove/edit event scheduling and Users or Guests, in or-

der to see events scheduled. This component will also manage (if necessary) the event for its entire period: it will need to be intefaced with Traffic Managment Handler and Notification Handler. Obviously, in order to save data, this component must be interfaced also with Account And Data Handler.

2.1.1.3 Help Request Handler

THIS component will manage external request, it could be used by Police Stations, Fire Fighters Stations and Hospital when an external emergency call arrive. It will insert the new accident in the system and for this reason it will need to be interfaced with the Account and Data Handler

2.1.1.4 Map Handler

IT have the task to provide an usable map to the application : it will received data by Google Maps API and it will prepare them in order to make the usable for Traffic Situation Handler

2.1.1.5 Notification Handler

THIS handler will manage the entire group of notification:

- notification attempts by Public Transport Company
- feedback by City Administration about notification attempts
- notification sended by City administration
- notifications send to Users

2.1.1.6 Parking Handler

THIS compontent will receive data from each car park in the city : each car that will go in or out by that car park will pass on a sensor that will send a specific signal to the handler. It will need to be interfaced with Account And Data Handler in order to update data and it could be used by guest for seeing parks availability and by users for seeing parks available or reserve a car parks

2.1.1.7 Pollution Handler

THIS handler will be used only for receiving data by CO_2 sensors and elaborate them with respect to prefixed values. If CO_2 levels will be to higher, a signal will be send to Traffic Situation Handler in order to block the car entries in the city.

2.1.1.8 Pubblic Transport Handler

THIS handler will be used for receiving GPS of Public Tranport vehicles and forward them to Traffic Situation Handler. Users And Guest could see these GPS position and Public Transport Company could manage transport line (for example add new line or remove it, insert information about momentanely technical failure and so on...).

2.1.1.9 Queue Handler

THIS component will manage the queue in the hospital, it could be access with privileges by hospital and without privileges by Guests and Users. More ditails abount algorithms that control this handler will be provide in chapter 3.

2.1.1.10 Traffic Handler

IT will be interfaced with:

- Accounts And Data Handler in order to receive data about new accidents and update the traffic situation
- Maps handler in order to intergat traffic situation with map;
- Pullution Handler in order to activate the block of the traffic with relation to CO_2 levels
- Traffic LIght and Main Monitors at the sides of streets in order to manage traffic in the better way

Users and Guest could be access to this component for viewing the traffic situation in real time and City Administion could deactivate automatic traffic managing anf perform if manually.

2.2.2 View Moduel

2.2.2.1 Guest View

THIS view will provide all basic functionalities: traffic situation, parking availability, hospital queues situation, event scheduled. For reach this set of views is sufficient have a device and an internet connection. It doesn't need any type of registration but it doesn't permit to use the entire set of functionalities of application.
For more details about difference between guest functionalities and user functionalitis might be consulted RASD.

2.2.2.2 User View

This view perform the complete experience that application wants to provide to users because it permits to use all functionalitis. In order to use this set of views is necessary an easy and quick registration. The functionalities that a user could be use with respect to guests are :

- receive notification about accidents in real time
- receive notification about event scheduled
- receive notification about unexpected traffic car block (due to pollution)
- reserve parking

2.2.2.3 City Administration View

This view could be see only with log in as superuser 'City Administration'. With this view, Administration employees could manage notification by Public Transport Company, could send notification to user, could take the control of traffic managing or scheduled new events.

2.2.2.4 Hospital View

This view could be see only with log in as superuser 'Hospital'. It will permit to manage the hospital profile, in order to edit hospital specialization, and it will permit to see all new help requests insert in the system in the last 60minutes and, if necessary, to add/remove an help request.

2.2.2.5 Police Station and Fire Fighters Station View

This view could be see only with log in as superuser 'Police Station' or 'Fire Fighter Station'. It will permit to see all new help requests insert in the system in the last 60minutes and, if necessary, to add/remove an help request.

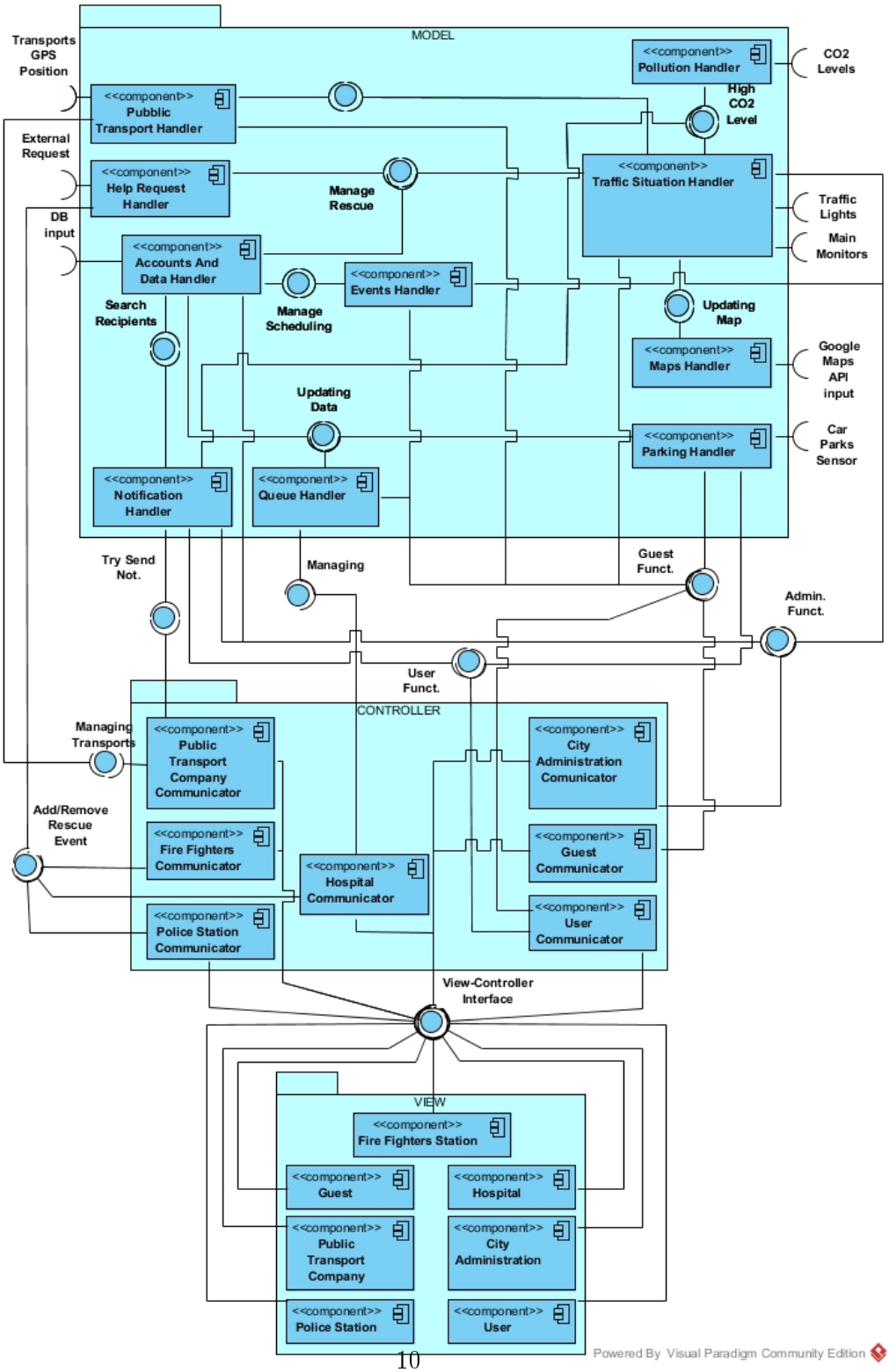
2.2.2.6 Public Transport Company View

This view could be see only with log in as superuser 'Public Transport Company'. It will permit to edit transport line route or direclty delete a trasport line if it has been deleted. It will permit also to try to send notification to user (for technical information or news) but this type of notification must receive a positive feedback by City Administration, in order to reduce unuseful message on citizen devices.

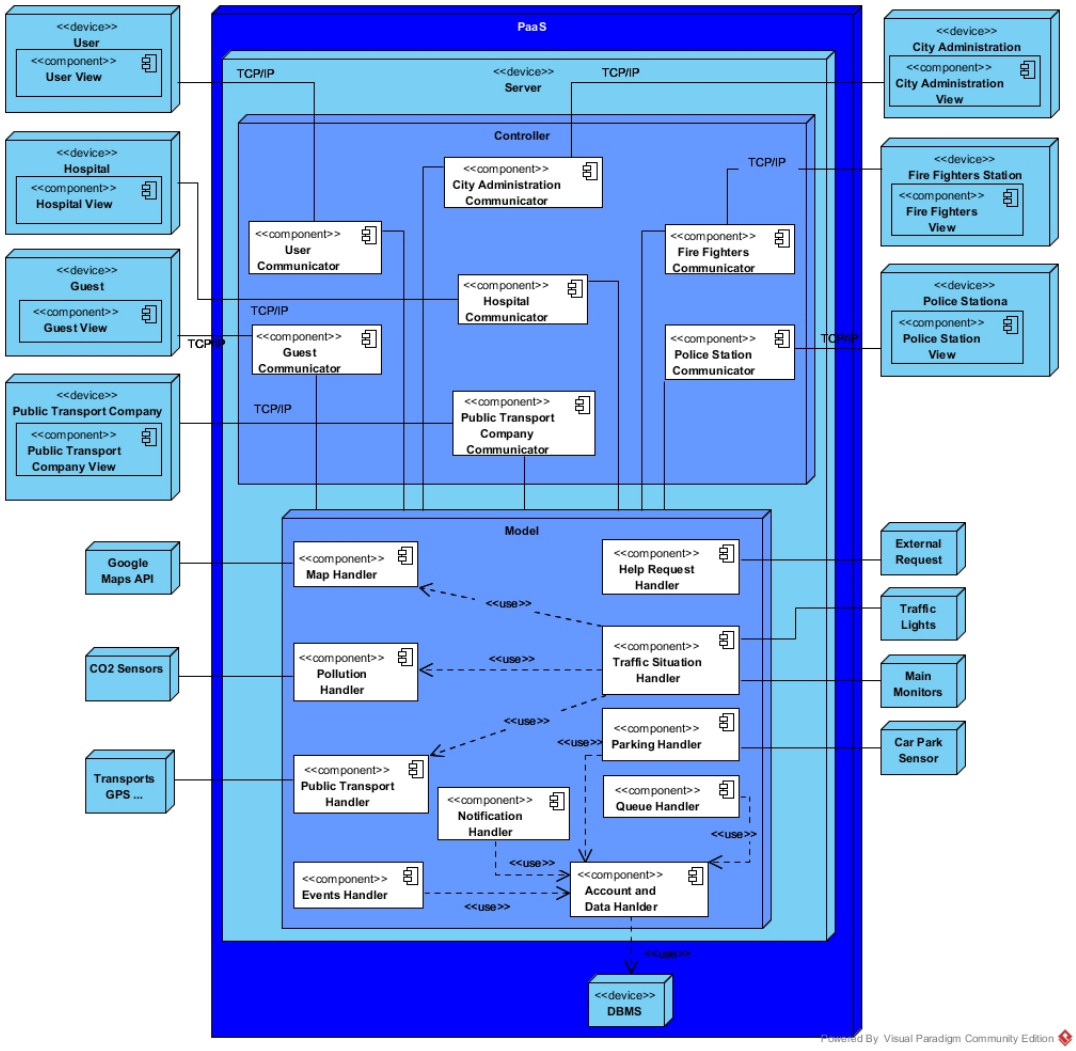
2.2.3 Control Module

This module represents the part of the system that is in contact with the users and guest. It is the connection between the view module, loaded on the user's devices, and the model module, that is loaded on the server. This part too has to be loaded and performed by a dedicated server area.

2.2 Component View



2.3 Deployment View



2.4 Runtime View

In this section will be present some view about possible usage of application. The objective is to bring out the interaction between components presented in this DD. For this reason will be used the concepts of the sequence diagram of RASD and will be modify with the DD specification. In the RASD, system has been presented with the following structure :

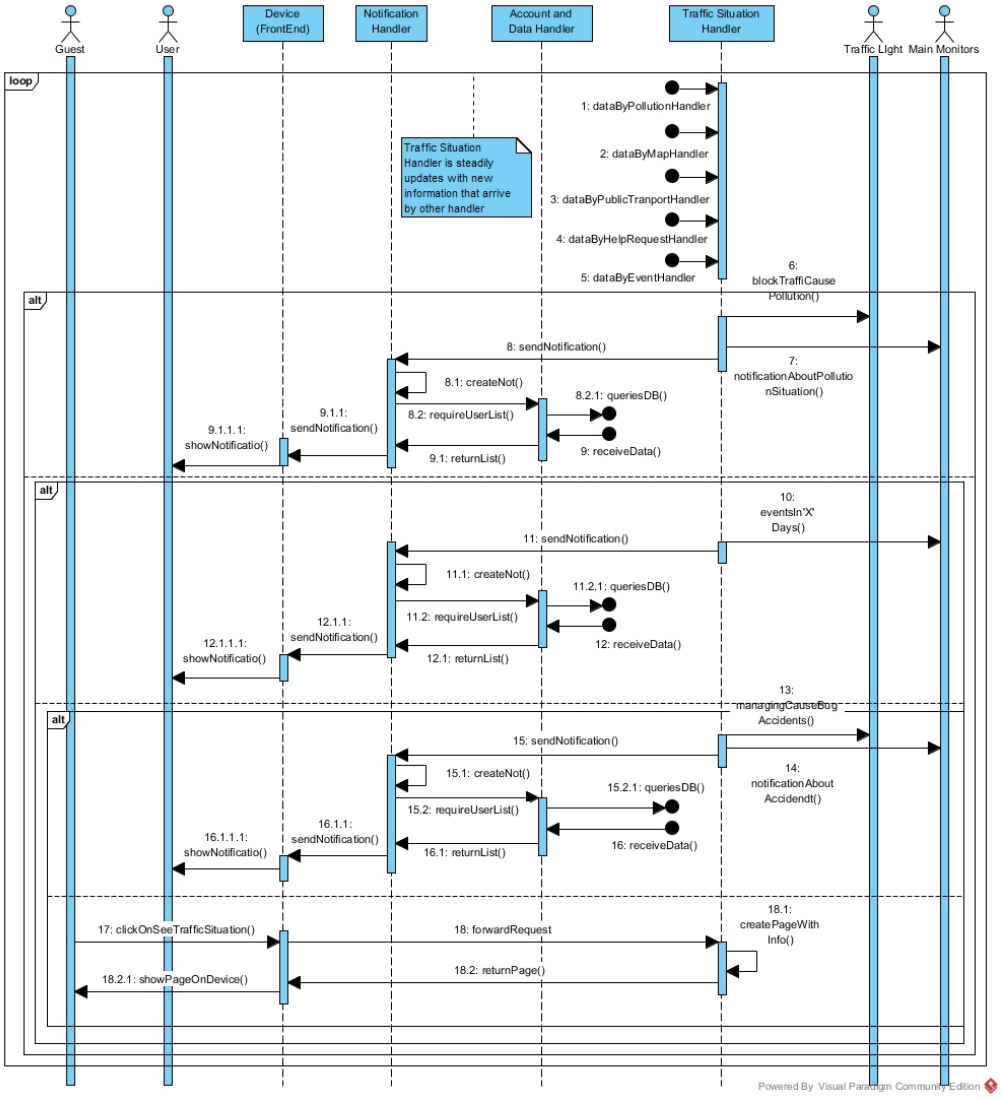
- **actors** that require action and funcionalities
- **device** that will implement the front end of application

- **application server** that queries the DB and implement funtionalities of sytem
- **DB and search engine** that will provide all stored data

After details provide in this DD, the new structure is with **actors** and **devices**, that rimain with the same meaninig, application server is substituted with **each specific handler** (with respect to the funcionalities required) and DB and search engine will be integrated with **Accounts and Data Handler**.

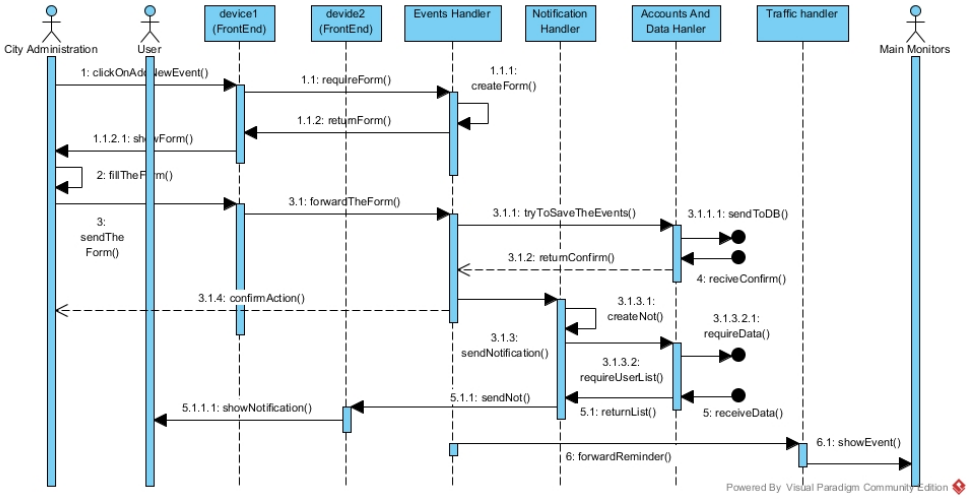
2.4.1 Traffic Managing Runtime

In the following runtime view i have brought out what happen in the Traffic Handler.
I have proposed some of action that Traffic Handler will perform with data that it will receive in each moment : it will manage traffic, it will block the traffic, it will forward notification. Obviously for doing this, it will interact with more of other Handler.



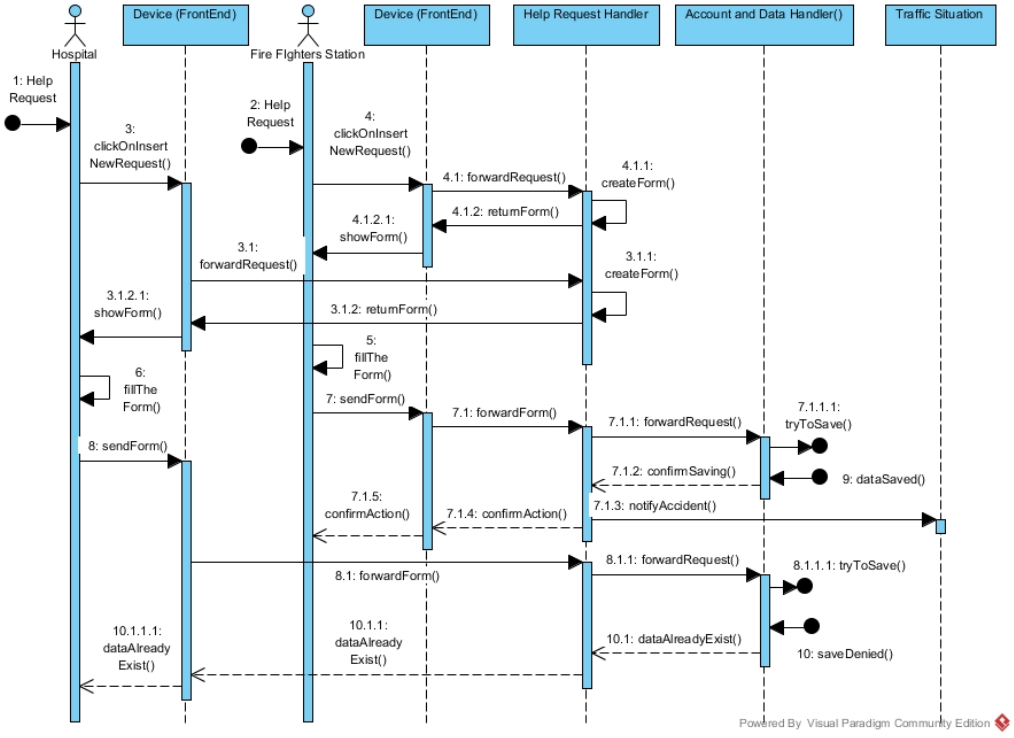
2.4.2 New Event Scheduling Runtime

In the nex runtime view i have shown how a new event could be scheduled. The main actor in City Administration, the only that will have privileges for doing this action.
Here are also brought out notifications that will be send to registered user when a new event will be scheduled and to main monitor in order to advise all citizens.



2.4.3 New Help Request Runtime

In this runtime view i propose a situation where the same help request arrive to an hospital and to a fire fighter station. I have brought out the concurrency of situation : the first that receive the request is not the first that insert the request into the system.
In this case, when hospital tries to insert the help request, system will found that a similar data will already exist.



2.5 Component Interface

In this section will be presented the main methods that each Handler will perform, whit received and returned, if present, variables.

2.5.1 Account And Data Situation Handler

```
1 public void addNewUser (NewUser u)
```

This methods receive the object NewUser that contain all data insert by a guest during the registration process

```
1 public void deleteUser (User u)
```

This method will receive a user as parameters and it deletes that user by DB.

```
1 public void profileManaging (User u)
```

This method could be used by users when they want to change personal information, it will interact directly with the DB.

2.5.2 Events Handler

```
public void addNewEvent (NewEvent e)
```

This methods receive the object NewEvent that contain all data insert by City Administration during the event scheduled

```
public Event editEvent (Event e)
```

This methos will receive a fixed event as paramethers, with specific changes, and will subsitute it with the old events (without changes).

```
public void eventReminder (Event e)
```

This methods will implements the reminder that will be forward to traffic situation handler 7 days before the events, 3 days before, 1 day before and the day of the events. In this way citizens will be advise about all events several time.

2.5.3 Help Requests Handler

```
public void addNewHelpRequest (NewHelpRequest h)
```

This methods receive the object NewHelpRequest that contain all data insert by Hospital, Police Station or Fire Fighters Station when someone adds a new request into the system

```
public void deleteHelpRequest (HelpRequest h)
```

This methods receive the object HelpRequest that contain all data refer a request that someone wants delete.

2.5.4 Map Handler

```
public Map updateMap (Map m)
```

This method will receive the map by Google Map API and will 'translate' it in order to allow to Traffic Handler to integrate map with help request, public transport position, accidents an so on.

2.5.5 Notifications Handler

```
public void sendNotification (UsersList ul, Message m)
```

This methods receive the list of user that should receive the message and the object that will contain the message.

```
public feedback chekcNotification (TransportNotification t)
```

This methods will allow to city administration to check notification send by Public Transport Company and decide which could be forward to users.

2.5.6 Parking Handler

```
public QRcode (ReservatioRequest rr, User u)
```

This methos will manage the reservation, when a reservation will be done, this method will create a specific QR code and it will be assign to that specific reservation

2.5.7 Pollution Handler

```
public boolean (PollutionLevel p)
```

This method will receive the pollution level by sensors in the city and will return a boolean variable that will be 1 when a fixed limit will be passed.

2.5.8 Public Transport Handler

```
public void (gpsPosition g, idVehicle i)
```

This methos will receive GPS position and transports vehicle ID, and it will format data in order to permit to Traffic Handler to integrate data in the map

```
public TrasportLine editTransportLine (TransportLine tl)
```

This method will allow to Public Transport Company to modify/delete/add transport line.

2.5.9 Queue Handler

```
public QueueSituation updateQueue (QueueSituation q)
```

This methods will allow to manage queue in the hospital, it will receive signals about queue (for example whan a new person will require that visit), it will update queue and will return the new queue situation for that specific visit

2.5.10 Traffic Handler

```
public void (Map m, Pollution p, TransportSituation t,
    NewHelpRequest n)
```

This can be considered the principal method of the application. It will receive continuously data by other handler and will integrate all in a unique map. It

will also take autimatic decision with respect to data received: for example an high poluttion level will impose the block of traffic.

2.6 Other Design Choises

Reguarding design pattern, the choice fell on MCV pattern for the following reasons:

- It reduce code complexity;
- It increase the flexibility of application created;
- It permit to work better when there are more developers in the same project becouse produce reusable code;
- It reduce dependency in the code

The architechture will be base on the most common tecnilogies on Cloud Computing, in this way will be possible reduce cost and reduce the load that application implies on devices. In the specific, the idea is follow Paas, a section of service-oriented architecture. With this architecture developers will have only tho develop the application, without thinking about memory allocation or other similar choise that will be manage by the company that provides PaaS. This choise will allows different advantages:

- the time to market will be reduced;
- cost will be reduced becouse no one will have to do any heavy investement, with the exception of the contract with the Paas supplier company;
- centralized development process, that implies a reduction of development time;
- the possibility to integrate in the application alot of web service (as Google Map API) that will allow the maximum level of customization.

3. Algorithms Design

3.1 Queue Algorithms

The algorithms that manages the hospitals queues is very basic. In the DB will be stored data with the following schema:

- first value in the record will be the hospital;
- second value of the record will be the specialization, this means for which pathology i'm requirinq a medical visit;
- third value will be a variable that will indicate the number of person that are waiting for it.

When someone will arrive in a hospital he/she could retire the ticket with his/her queue number, after selecting the right hospital specialization. Then the system will update the third value of the record reguarding the selected hospital specialization. When someone will be called in the ambulatory, nurse will inform system that will reduce to one that queue.

3.2 New Help Request Algorithms

As explain in RASD i assume that when there is a big accident somone call police ,hospital or fire fighter. Usually there is an operator that answer to help requests and must advice his/her collegues in order to permit a rapid rescue. The addition of new help request to the system could be perform in the following way:

- When he/she answer to help request he/she could see on the right side of monitor the help requests received in the last 60 minutes
- If any request corrispond to the actual one, operator will add the new request
- He/she must take note about main information (place of accident, people injured, dangerous situation...)

- The information will be send directly to collegues, but also to system
- System will check if there will be some similar record in the DB, giving following priority:
    - System will exclude all help request that have been included more that 20 minutes ago
    - System will exclude all requests not included in a radius of 150m
    - System will exclude all requests with different data (different number of car involved, different number of injured person

  If some of the previous discrimination will create an ambiguity, human decision will be required.

When the rescue will be complete, the operator could remove the help request from the system if other operators have not already done it.

3.3 Traffic Managing Algorithms

We assume that city were SmartCityAdvisor will be used will be divided in areas. The number of them will be variable with respect to the expansion of the city. When a pollution sensor will releve a level of pollution higher than the fixed level, it will send a precise signal to the Pollution Handler. Then Pollution Handler will forwar to Traffic Situation Handler data that will conatin:

- ID about zone where sensor has been activated;
- Pollution level, that will be a number between 1 and 10 that will indicate the danger of situation.

When Traffic Situation Handler receives this data will start its tasks:

- It will start to send information to the interested areas, then to the adjacents one and so on
- It will send information to main monitors at the side of street if Pollution Level will be higher or equal than 6 ;
- It will start to manage traffic light in order to reduce (initially) and block (as final situation) the traffic throgh the city until the CO2 level will be higher that 2;
- It will send notification to all users where will be indicate the zone where the sensor has been activated and an aproximatively time before that the entries could be reopen.

A different situation will be perform if an events has been scheduled: in this case must be blocked all streed interested by the event.
We assume that Event Handler will send data to Traffic Situation Handler each day: it will send all event scheduled that will happen in 7 days, in 3 days, tomorrow and today. Notification to users will be send only for the tomorrow events and in the other case citizen will be informed with main monitors at the side of streets. In the period of event, Traffic Situation Handler will use traffic light in order to block cars, all main monitor in the interested zone will explain to citizens what is happened and, if necessary, City Administration could interact with Traffic Situation Handler for manually decision.

3.4 Car Parks Reservation Algorithms

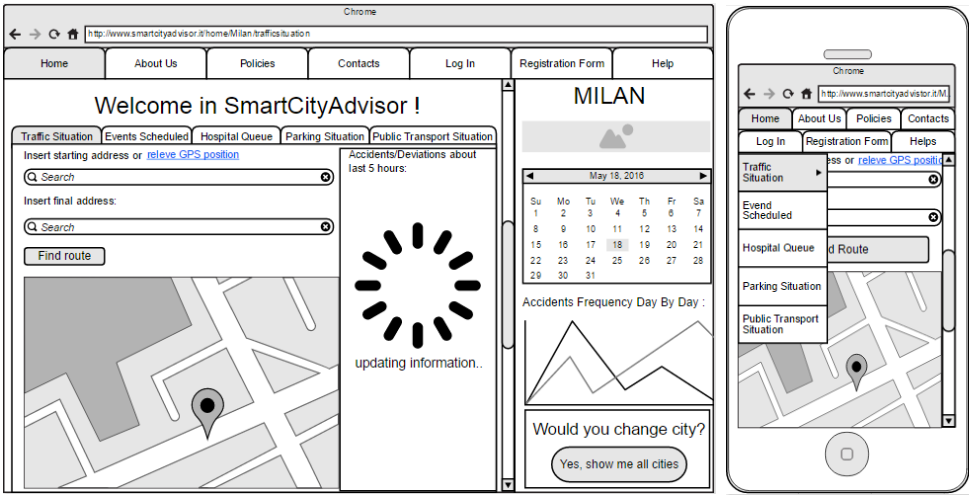
A user could check availability of parking but also reserve a car park. The algrithm could be describe in the following way:

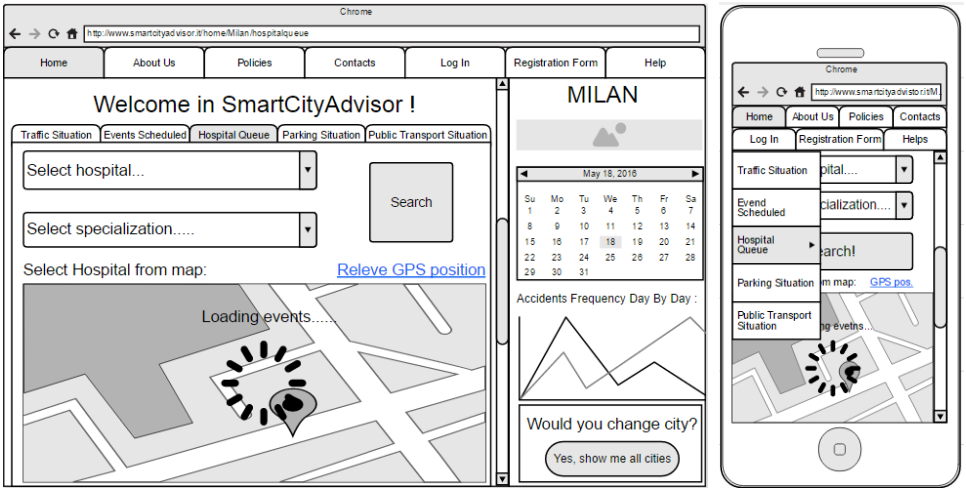
- User choose in which parking want to reserve a parking place and he/she will indicate the reservation time (15minutes, 30minutes, 1hour...)
- Data will be send to Parking Handler that will reduce the number of free car park and will assign to one a QR code.
- The same QR code will be send to user
- When the QR code will be received by user, the resarvation cuould be considered finish and the reservation timer will start.
- When the user will arrive to the parking, he/she will show to a QR reader the code and, if the timer will not arrive to the end, the entry will be allowed.
- The payment will be perform in an automatic cash before leave the parking, that will be controlled by registration car number: when a car arrive the registration car number will be save in the DB with the entry hours and when someone want leave the parking, he/she will insert their regirstration car number in order to calculate the parking tima and consequently the price.
- In case of reservation will be apply an additional cost

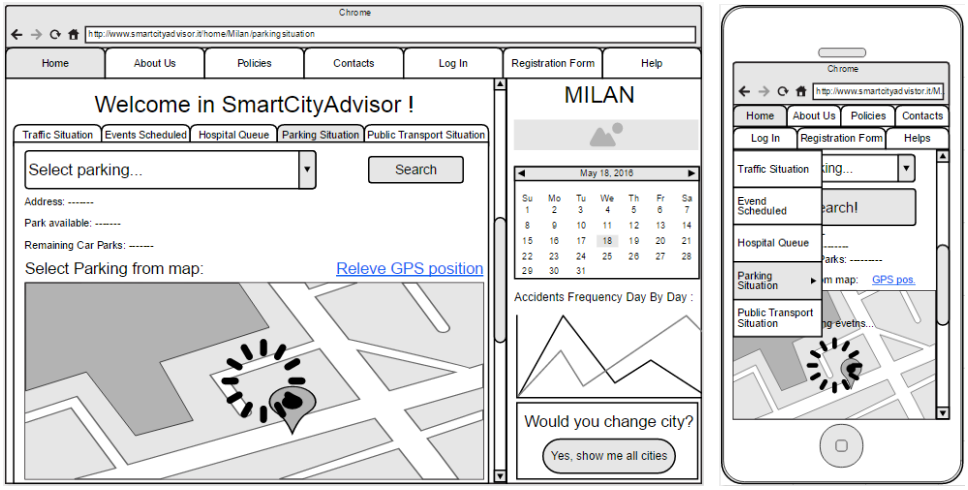
4. User Interface Design

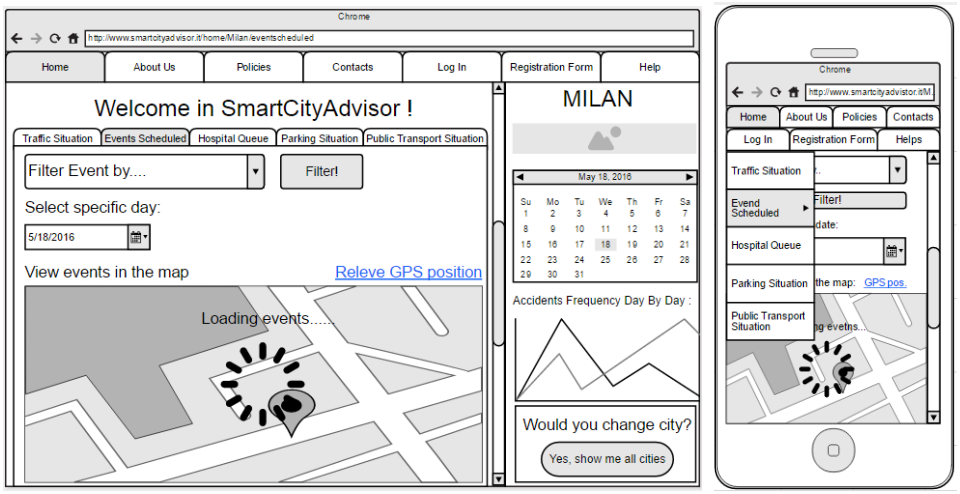
The best way in order to explain the experience that system will propose to all is the use of graphic mokeUps. In the following section will be presented the main page that guests, users and superusers will see when they will open my application. Each page will be proposed in a desktop version in the left side and in a smartphone version in the right side.

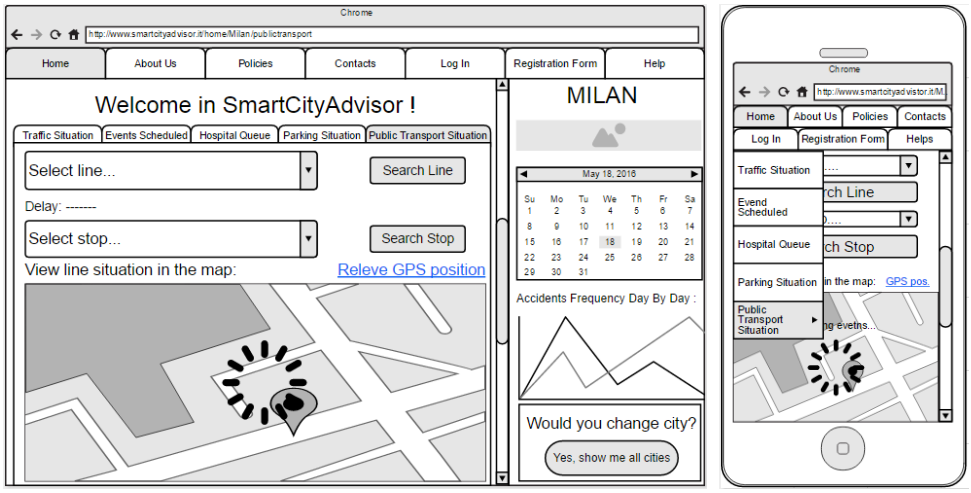
4.1 Guest Experience

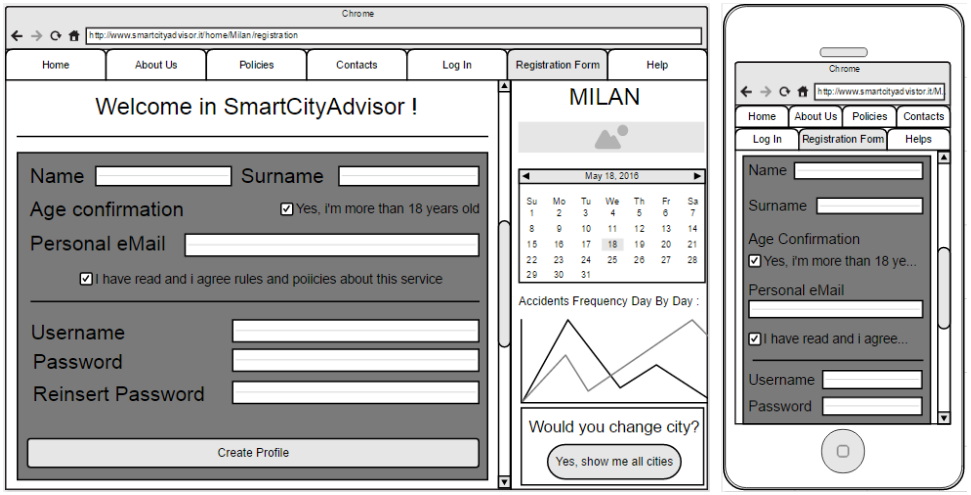




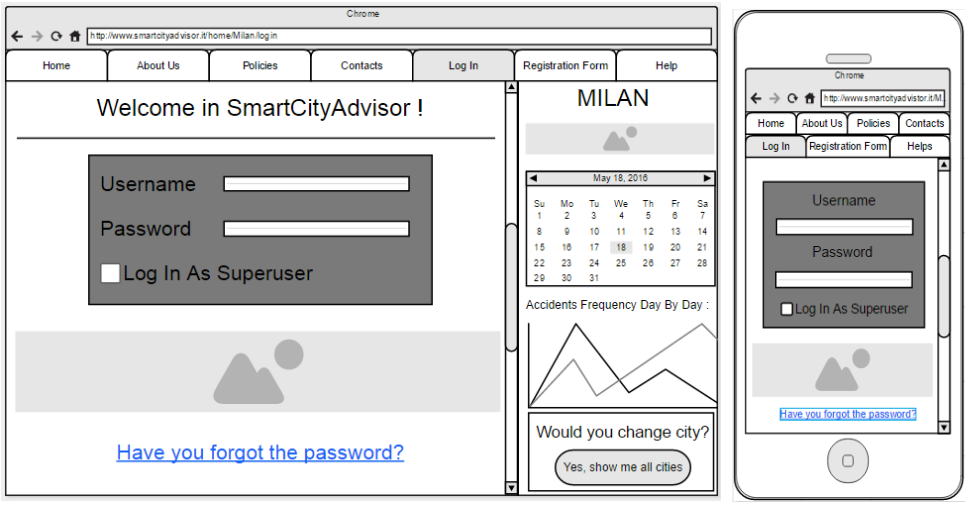

Chrome
http://www.smartcityadvisor.it/home/Milan/parkingsituation
Home
About Us
Policies
Contacts
Log In
Registration Form
Help
Welcome in SmartCityAdvisor !
Traffic Situation
Events Scheduled
Hospital Queue
Parking Situation
Public Transport Situation
Select parking...
Search
Address: -------
Park available: -------
Remaining Car Parks: -------
Select Parking from map:
Releve GPS position
MILAN
May 18, 2016
Accidents Frequency Day By Day :
Would you change city?
Yes, show me all cities


Chrome
http://www.smartcityadvisor.it/home/Milan/eventscheduled
Home
About Us
Policies
Contacts
Log In
Registration Form
Help
Welcome in SmartCityAdvisor !
Traffic Situation
Events Scheduled
Hospital Queue
Parking Situation
Public Transport Situation
Filter Event by....
Filter!
Select specific day:
5/18/2016
View events in the map
Releve GPS position
Loading events.....
MILAN
May 18, 2016
Accidents Frequency Day By Day :
Would you change city?
Yes, show me all cities


Chrome
http://www.smartcityadvisor.it/home/Milan/publictransport
Home
About Us
Policies
Contacts
Log In
Registration Form
Help
Welcome in SmartCityAdvisor !
Traffic Situation
Events Scheduled
Hospital Queue
Parking Situation
Public Transport Situation
Select line...
Search Line
Delay: -------
Select stop...
Search Stop
View line situation in the map:
Releve GPS position
MILAN
May 18, 2016
Accidents Frequency Day By Day :
Would you change city?
Yes, show me all cities


Chrome
http://www.smartcityadvisor.it/home/Milan/registration
Home
About Us
Policies
Contacts
Log In
Registration Form
Help
Welcome in SmartCityAdvisor !
Name
Surname
Age confirmation
Yes, i'm more than 18 years old
Personal eMail
I have read and i agree rules and policies about this service
Username
Password
Reinsert Password
Create Profile
MILAN
May 18, 2016
Accidents Frequency Day By Day :
Would you change city?
Yes, show me all cities

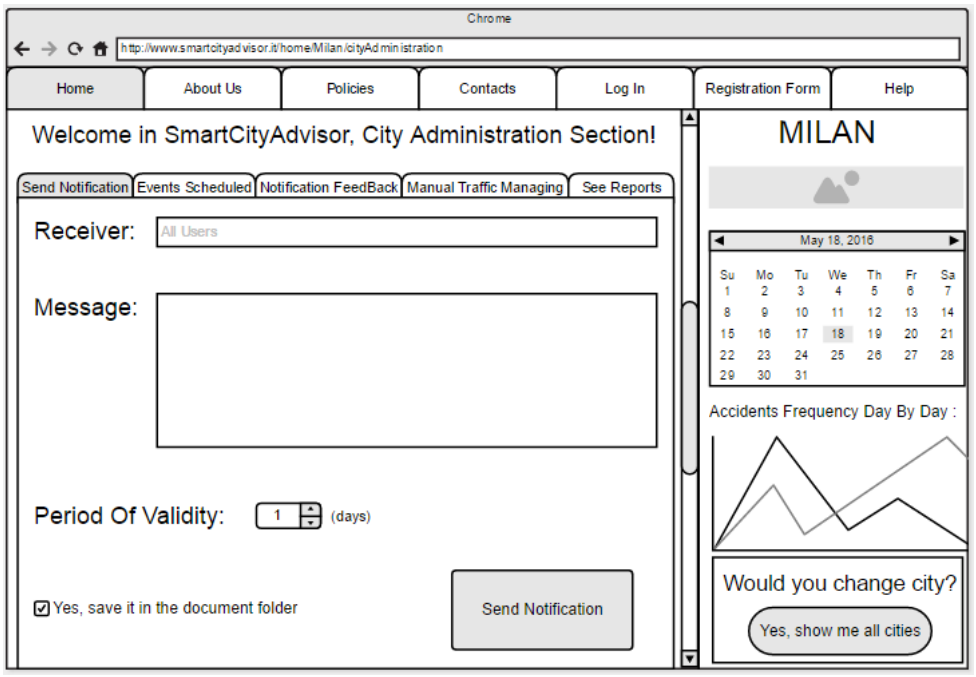
4.2 User Experience

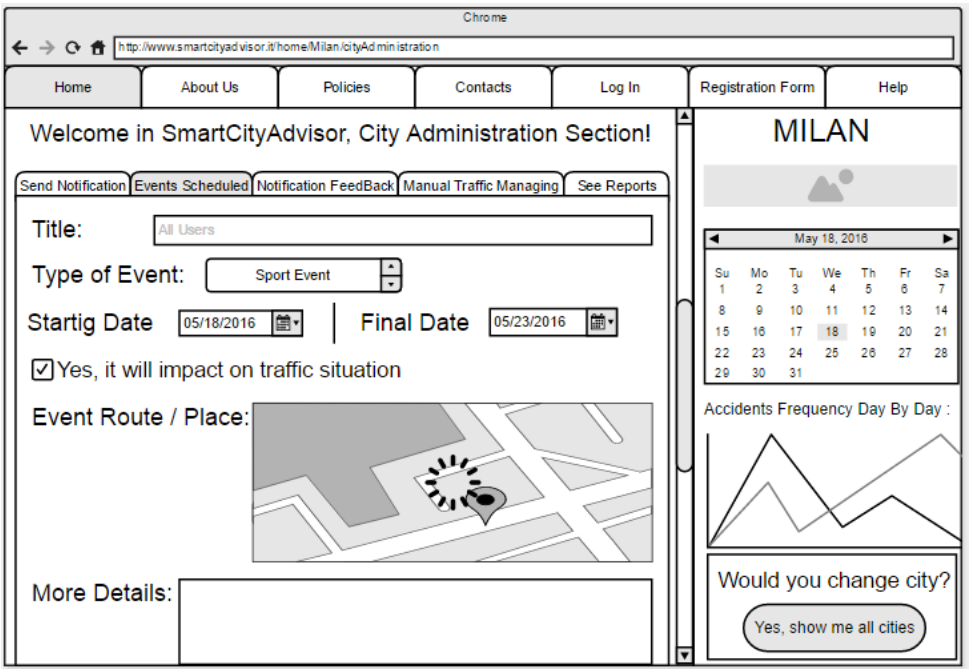


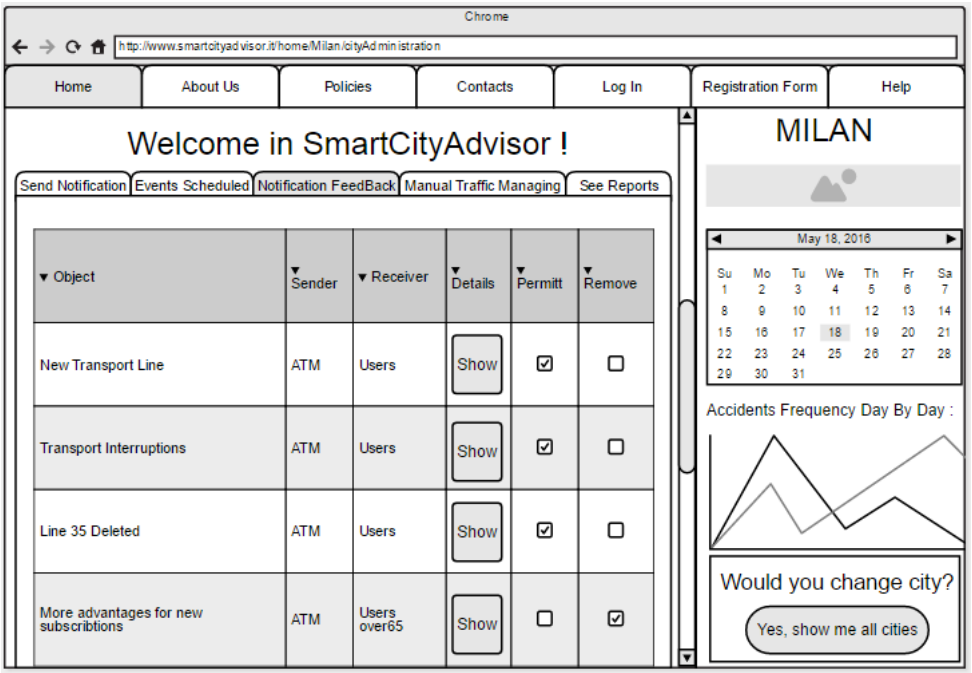
4.3 Superuser Experience

SuperUsers experience will be proposed only in desktop version becouse might be difficult to manage a city by a smartphone and we want only the best for citizens.

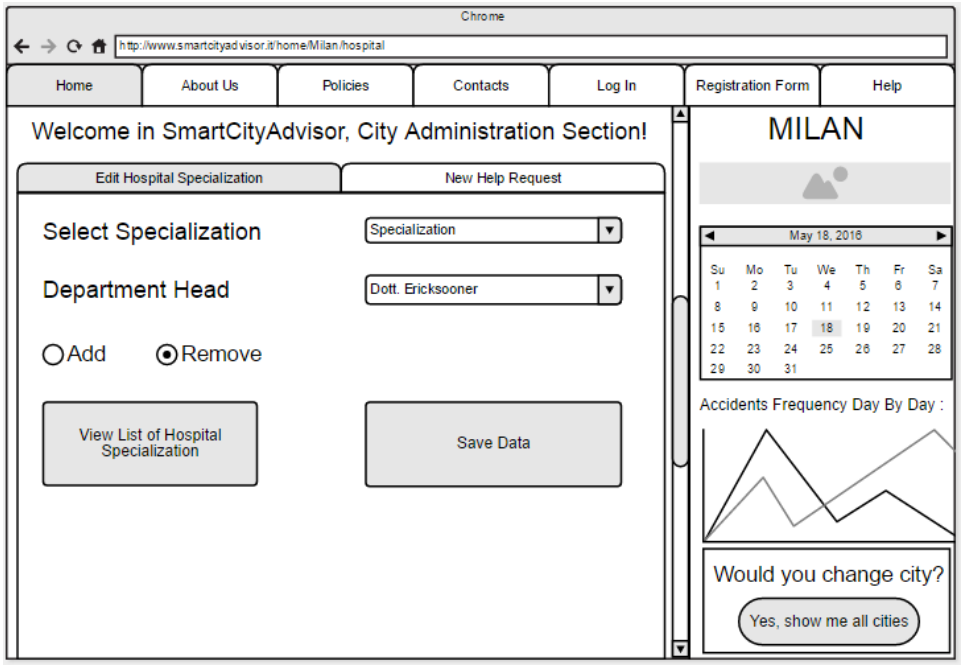
4.3.1 City Administration



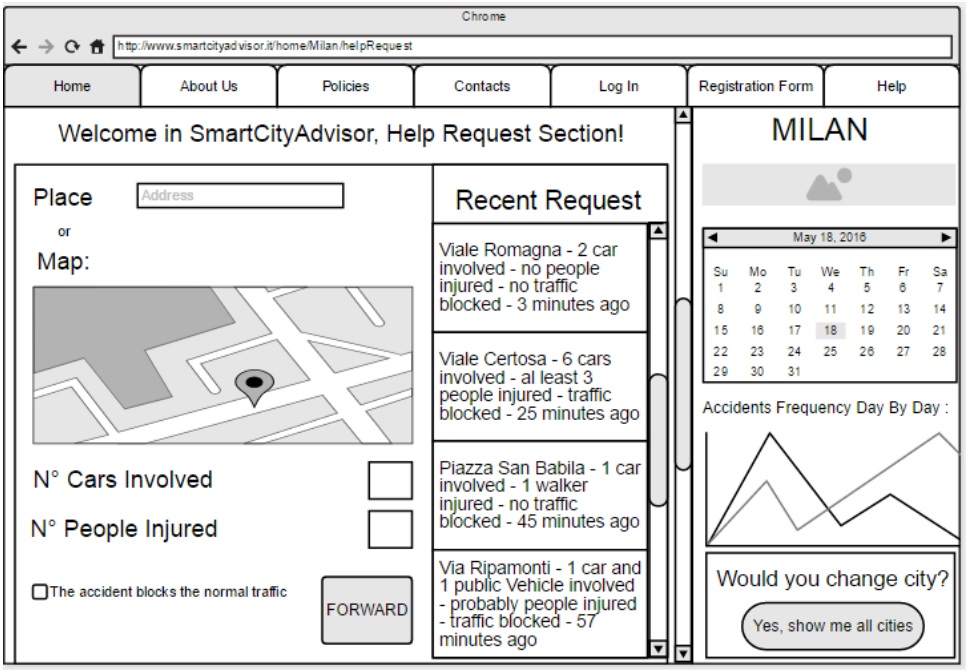

Chrome
http://www.smartcityadvisor.it/home/Milan/cityAdministration
Home
About Us
Policies
Contacts
Log In
Registration Form
Help
Welcome in SmartCityAdvisor, City Administration Section!
Send Notification
Events Scheduled
Notification FeedBack
Manual Traffic Managing
See Reports
Title:
All Users
Type of Event:
Sport Event
Startig Date
05/18/2016
Final Date
05/23/2016
Yes, it will impact on traffic situation
Event Route / Place:
More Details:
MILAN
May 18, 2016
Accidents Frequency Day By Day :
Would you change city?
Yes, show me all cities


Chrome
http://www.smartcityadvisor.it/home/Milan/cityAdministration
Home
About Us
Policies
Contacts
Log In
Registration Form
Help
Welcome in SmartCityAdvisor !
Send Notification
Events Scheduled
Notification FeedBack
Manual Traffic Managing
See Reports
Object
Sender
Receiver
Details
Permitt
Remove
New Transport Line
ATM
Users
Show
Transport Interruptions
ATM
Users
Show
Line 35 Deleted
ATM
Users
Show
More advantages for new subscribtions
ATM
Users over65
Show
MILAN
May 18, 2016
Accidents Frequency Day By Day :
Would you change city?
Yes, show me all cities

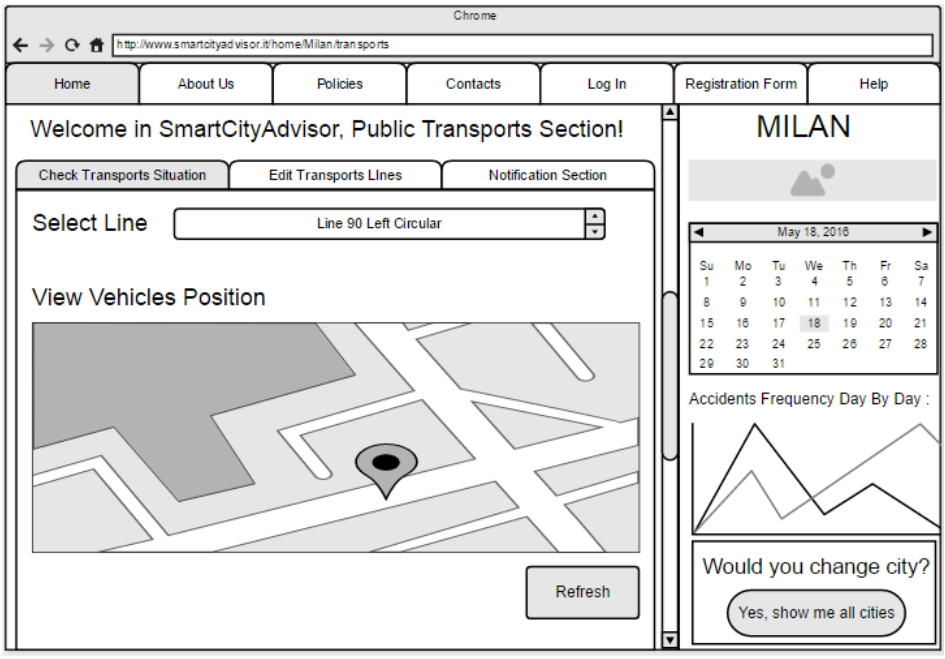
4.3.2 Hospital

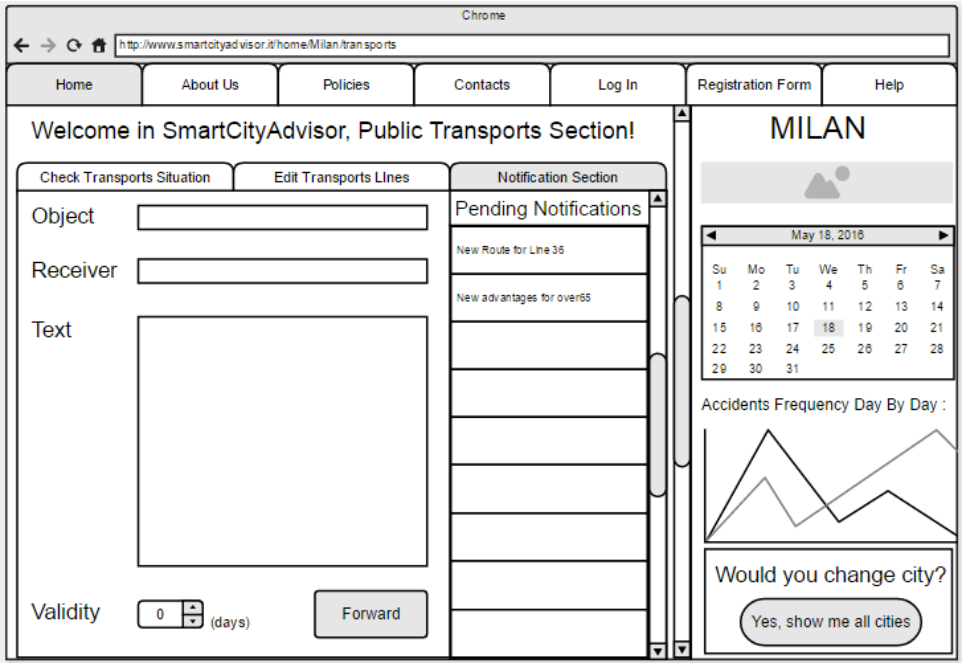


4.3.3 Police Stations and Fire Fighters Stations



4.3.4 Public Transport Company





5. Requirements Traceability

5.1 Sign Up

[R1] Guest must no be already registered

[R2] Guest must provide some personal information : Name, Surname, Age, eMail, Username, Password

[R3] System will send an eMail to the indicate address in order to activate the account

[R4] System will ask to insert password two times: the two password must be identical.

All these requirements are satified by Account and Data Handler, it will be interfaced with Notification Handler in order to send confirmation e-mail to Guests right after registration has been done.

5.2 Types of Possible Log In And Functionalities

5.2.1 Log In

[R1] User must insert username and password

[R2] If he/she wants, he/she could use the email address as username

[R3] If necessary, will be avaible a 'recovery password' process that will use the indicated email

These requirements is performed by Account and Data Handler that will be connected with DB and in this way it could be check if insert username and password will have any correspondece.

5.2.2 Profile Managing

[R1] User could change email address, but only one time.

[R2] User could change password one time at week

[R3] User could select which notification he/she wants recive (traffic, accidents, special notification, events....).

[R4] User could delete his/her account in each moment

Requirements about profile managing are performed by Account and Data Handler, becouse they require the access to DB in order to update data.

5.2.3 Administation Functionalities

[R1] Administration must manage the entire application, manually or autimatically

[R2] Administration must provide at least 3 people in order to provide a quickly response if it is necessary

[R3] Administration could accept or refuse Public Transport Company notification

[R4] Administration could see usage report, as user access, user registred, accedets done in a period and so on.

[R5] It must provide manteinance, in order to guarantee the service

[R6] It is the only that can insert programmed event, as manifestations, road works, Vips visits, ecological days...

These one is perfomed with the usage of Notification Hanlder (in order to create, delete, modify notication or accept/refuse Public Transport Company notification), Events Handler (in order to provide all information about scheduling events), Traffic Situation Handler (in order to manage manually traffic situation, if necessary), Account and Data Handler (in order to see report or manage any data)

5.2.4 Hospital Functionalities

[R1] Funcitonality could be done manually by an operator on automatically by an information system

[R2] When a person take a tiket for the queue, the queue for that specific medical visit will be update automatically

[R3] When a medical visit starts, the waiting ticked will be read electronically and this operation will update the queue for that specific visit

[R4] When Hospital recive a call for an accident on the street, it will be registred and automatically insert in the system

[R5] If the indicated position of the accident is already present in the system, there will not be any updating. This means that probably police station has already update the event.

[R6] When the medical staff return from the accident, it will be registred and automatically insert in the system

[R7] If the indicated position of the accident is not present in the system, there will not be any updating. This means that probably police station has already update the solve accident.

[R8] Hospital structure could change the specializations present in it, in case someone of them is closed

These requirement is obtained, after a log in as Hospital superuser, with Queue Handler, Help Request Handler and Account and Data Handler (if will be necessary modify Hospital information or specializations)

5.2.5 Public Transport Company Functionalities

[R1] It must constantly provide the position of each vehicle

[R2] It must send special notification reguarding company, as strike or own broken vehicle or line interrupted, but after Administration approvation

[R3] It could manage the service offered : add new transports line, remove old transports line, change transports route and so on.

These requirements is managed by Public Transport Handler, Notificaiton Handler and Account And Data Handler. Public Transport Handler will have the task to farward information to Traffic Situation Handler that will integrate information about transport vehicles with the other one

5.2.6 Police Station And Fire Fighters Station Functionalities

[R1] Funcitonality could be done manually by an operator on automatically by an information system

[R2] When Police Station recives a call for an accident on the street, it will be registred and automatically insert in the system

[R3] If the indicated position of the accident is already present in the system, there will not be any updating. This means that probably an hospital has already answer to the calling.

[R4] When the police staff return from the accident, it will be registred and automatically insert in the system

[R5] If the indicated position of the accident is not present in the system, there will not be any updating. This means that probably an hospital has already update the solve accident.

These requirements are satified by Help Request Handler. Police Stations and Fire Fighters Stations could only receive, add, edit and delete this type of request.

5.2.7 Guests and Users Funcitonalities

[R1] Guests can see traffic situation, queue situation, parking availabilities and public transport situation

[R2] User can perform each functionalities that can perform a simple guest

[R3] User can receive notification by City Administration and, after positive feedback, also by Public Transport Company

[R4] User can reserve a car park, he/she will indicate place and how long reserves it.

[R5] User could manage his/her profile data

These requirements are handler with different component : Notification Handler, Traffic Situation Handler, Queue Handler, Parking Handler, Account And Data Handler. Obviously each handler will return to person only the view permitted by own privileges. (for example a guest could not reserve a parking)

6.Used Tools and Work Timing

FOR create this documet we have used:

LYX to create a well-formatted document

moqups.com to create the UI sketches;

VisualParadigm10 Community Edition to create Sequence Diagrams and State Charts;

REGUARDING the drafting of this document, i have spent about 20 hours. Problably, during a team group, this thin will be the same for each component becouse the time that normally is used for coordinate the work is very relevant.