

BARCELONA SCHOOL OF INFORMATICS

Fita de seguiment

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1 Context

1.1 The problem

Cities around the world can generate a lot of data. This data is usually fetched through sensors. Why do these cities fetch all this data? Basically, each city can collect and process all this data and convert it into valuable information. This information can then be used to improve the city in multiple ways. Right now, there is an european effort called **iCity** that groups four european cities: London, Barcelona, Genoa and Bologna. These four cities have multiple sensors on their streets that collect a wide variety of data:

- Air pollution.
- Traffic.
- Irrigation control.
- Pedestrian flow.

1.2 The idea

With all this quantity of data going on, we need a reliable platform that integrates everything in an easy way. The **iCity** platform has shown to be quite good at integrating all the cities. However, this platform is too raw: it just contains the fetched data as-is. It would be more useful if some platform could wrap the data from **iCity** and provide more rich and useful services and information around it.

My Bachelor's Degree Thesis is about building this platform. This platform will be built with the Storm framework. This framework will allow us to process all the data from **iCity** and provide rich information in **realtime**.

1.3 Similar projects

As part of my Bachelor Degree Thesis, I have done some research on this area. I have not found any project that has an identical aim as this platform. However, I have to admit that this project overlaps a bit with the iCity platform.

1.4 Challenges

It has passed some months now since I started this project. When I started I hoped to obtain all the information also from the Barcelona Open-Data initiative. However, this initiative turned out to be not what I expected:

it is just a repository of static data. Since my platform requires dynamic and realtime data, fetching static data is pointless. This situation did not affect this project greatly, since the iCity platform turned out to be exactly what I needed, and, therefore, I did not care about Barcelona's OpenData any longer.

Another challenge has been that I am doing this project with the Scala programming language. To be honest, I could have done this project with just Java, since Storm is available to any programming language that runs on the JVM. Scala, however, is more modern than Java, and I am having more fun writing Scala code than with Java. So, even if I am new to Scala and it is a challenge, it is a challenge in which I am having a lot of fun.

2 Scheduling

2.1 Changes on my original schedule

There have not been any major change to my initial schedule. I have to admit that for personal reasons I have started the project a couple of weeks later than expected. This means that my final schedule has shifted a bit from my original one. This has not resulted into many problems because:

- In my original Gantt I kept the “Analysis and design” and the “Development of the core” phases separately. I finally merged these two phases into one. This turned out to be fine.
- The “Providing services” phase has been shorter than expected.

I have not re-adjusted my methodology of work in order to keep the schedule. Moreover, since there are not many alternatives out there in this field, I have not spent too much time investigating on other possible designs or implementations.

2.2 State of my thesis

Taking into consideration the fact that I have shifted the schedule a couple of weeks, I can conclude that I am on schedule. More specifically, this is what I have right now:

- A couple of services have already been roughly implemented. I expect to fully test them in the following weeks.
- I have made some calculations around the requirements of the system. These numbers will be more clear in the following weeks, when I will make some benchmarks.

Therefore, I have already done all the heavy lifting of my thesis. Now, this is what is still left to be done:

- Improve the current services. I have not document them yet and some tests can be improved.
- I have not done any real benchmark yet. Therefore, any calculation that I have made until now about the requirements of the platform is still an approximation.

3 Laws and regulation

The platform that I am building in my Thesis fetches all the data from **iCity**. The iCity platform is an european effort that fetches all the data in a safe and lawful way. Therefore, I conclude that my platform is not, in any way, violating any european law.

4 Knowledge learnt at this university

Lastly, I would like to say that this project has served me greatly to apply all the knowledge that I have accumulated during my time at this university. More specifically:

- **Software design:** I have learnt a lot on designing software at this university. In this project I had the oportunity to apply all this knowledge in order to design and build the platform itself.
- **Clusters and distributed architectures:** I have taken some courses regarding clusters and distributed architectures. These course have proved me how important they were.