1. INTRODUCTION

Within Making Sense project (http://making-sense.eu/), European Union's Horizon 2020 research and innovation program, we run three pilot studies in Amsterdam:

1- Urban Airq,
2- Smart Kids Lab,
3- Making sense of gamma radiation.

In this series of posts I will describe a part of the development that I implemented for the second pilot, Smart Kids Lab. To encourage, attract and empower kids in primary schools to measure and monitor the environment where they live, we used two approaches:

- a list of low technological sensors (http://waag.org/sites/waag/files/public/media/publicaties/smart-kids-lab-english.pdf),
- two air quality sensor kits placed the schools sending real time data to an online platform.

In total three schools and six classes took part to the project.

One of the sensor kits is called "Bora Lora kit" and it will be the subject of my posts.

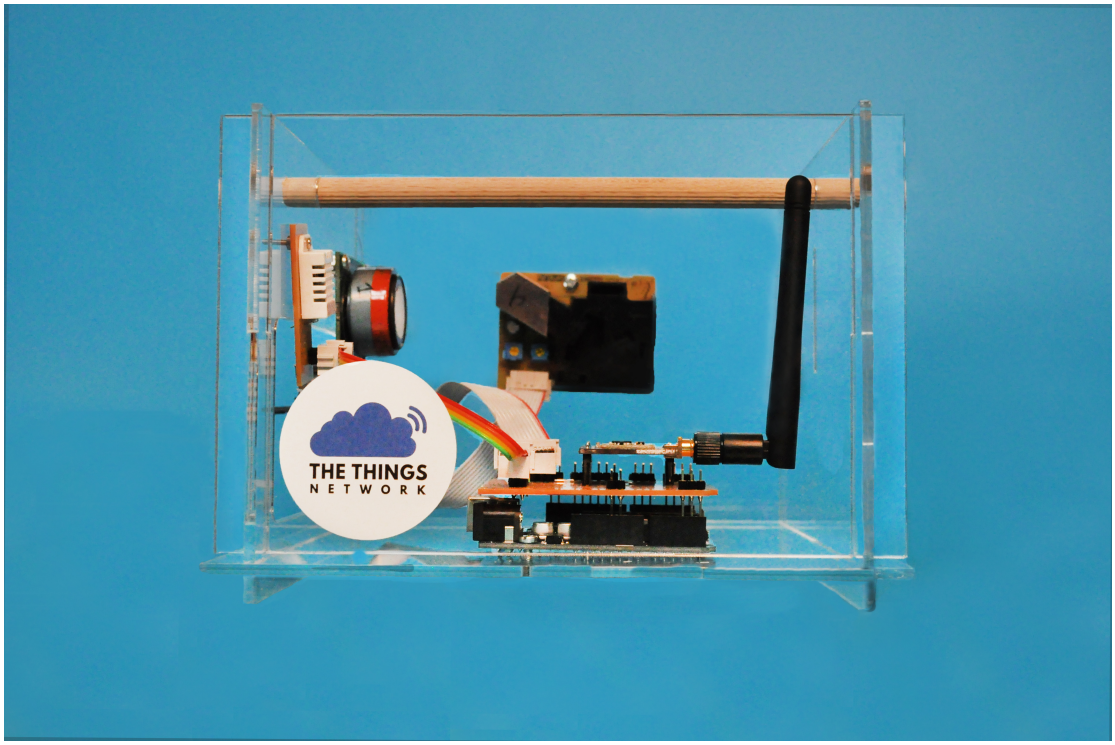

Fig.1, Bora Lora kit.

1.1 From Bora to Bora Lora

For the first pilot of Making Sense we developed an air quality sensor kit called Bora, you can find the documentation at the following link: https://github.com/waagsociety/making-sensor/tree/master/sensor_kit.


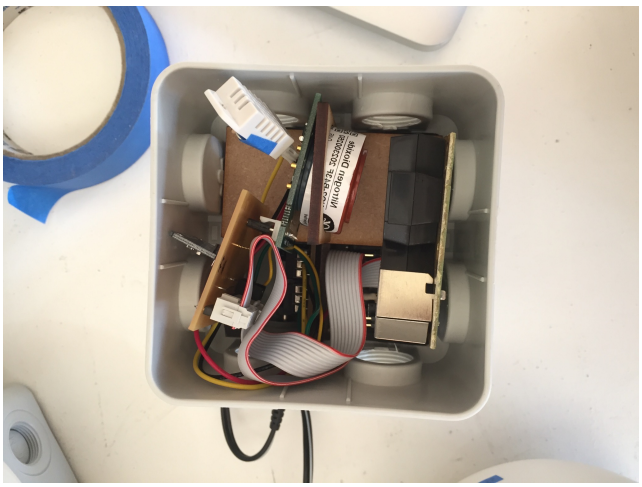

Fig.2, Bora kit.

The kit measures NO2, Dust, temperature and humidity and during the operational period of the pilot, 16 citizens connected the devices to their wifi local network to send the data to our server.
With this experience I decided to further develop the sensor kit to improve some criticalities:

- un-stable and weak connectivity of the wifi module,
- high power consumption,
- lack of real time data visualization.

To improve the first two points we decided to use one the current emerging technology available for IoT applications: LoraWAN, https://www.lora-alliance.org/What-Is-LoRa/Technology ; we decided to implement in our sensor kit a Lora radio and to use The Things Network hardware and backend solutions to smooth the data flow. The Bora kit became then Bora Lora kit.

The lack of a real time visualization of the data was solved using the smartcitizen.me platform and the last released APIs of it.

1.2 Planning ahead

The only way I see to respect the deadlines of a project, especially when there are many parts involved, is to clearly understand what are the steps; this was my plan:

- Learn about LoraWAN and status of the art.
- Transform the Bora kit in a Lora connected device
- Evaluate the available infrastructures
    - create the infrastructure if needed
- Create the bridge for the data between the sensor kit and the final digital platform.