

20-21 International Project

# REPORT: SPRINT 2

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Group 2

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## 1 Overview

In this sprint we were focusing on getting the core of our product running. It was also important that we communicated clearly so everyone knew how the project would evolve.

## 2 Sprint review

### 2.1 Hardware

The goal for this sprint was to get a working circuit so we will be able to measure the ECG. We also needed to test the velostat foil to check if it was suitable for measuring heartbeats. Lastly, we needed to write the code for the device so it could measure the ECG.

In this second sprint, we were able to write working code that we are going to use to measure the ECG. Moreover, we wrote other code need for the device, such as controlling the ON/OFF LED and the Wi-Fi connection status (shown with the same LED). We also tested the velostat foil and we came to the conclusion that the velostat foil is not capable of measuring the heartbeat based on the movement of the user's veins. The foil just isn't sensitive enough.

Finally, we could get a working circuit for measuring the ECG. We are having problems with the bandpass filter. To fix this problem, we need guidance from a teacher that we will talk to upcoming week.

### 2.2 Software

#### 2.2.1 Frontend

For the frontend we use flutter, this is a kit that uses the code language "dart" to create an app for both IOS and android. The app is the central point where we will visualize our data, for this we use various libraries including: cupertino icons and fluttercharts. On the basis of JSON data we convert this to a "voltage series" class list, which will load the data points into the graph. At the moment there is still a problem between this conversion of JSON data to List<VoltageSeries> but we hope to fix it as soon as possible. In addition, we already have a basic layout that will be further expanded as the project progresses.

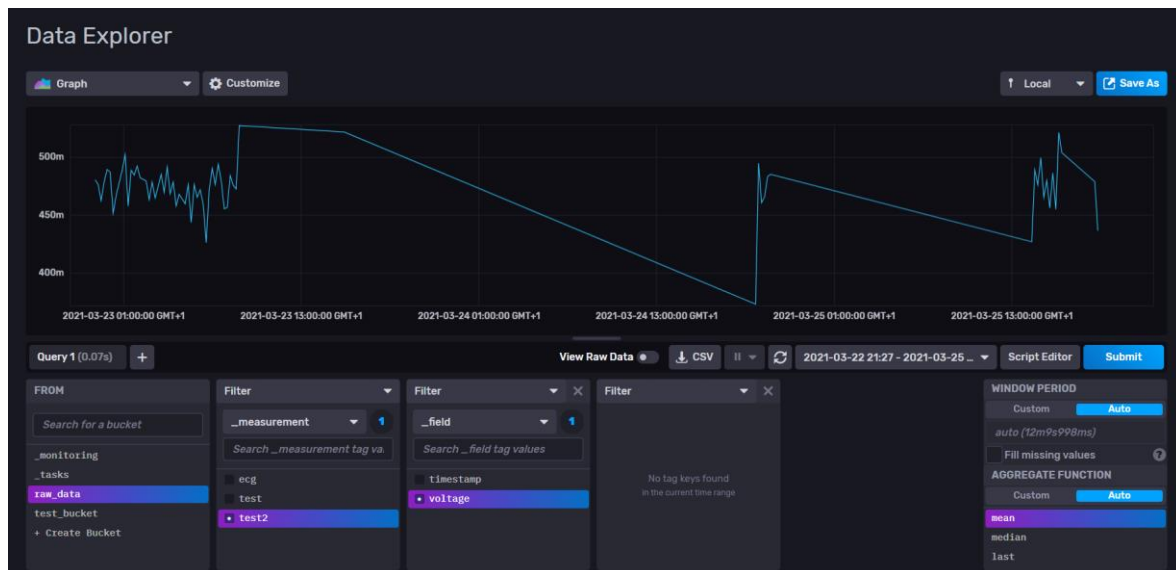
#### 2.2.2 Backend

For the backend side of our project, the setup is a little more complex. We're using a Raspberry Pi as a server. Here, there are running two Docker containers. One of them is our database InfluxDB, the other one is NodeRed.

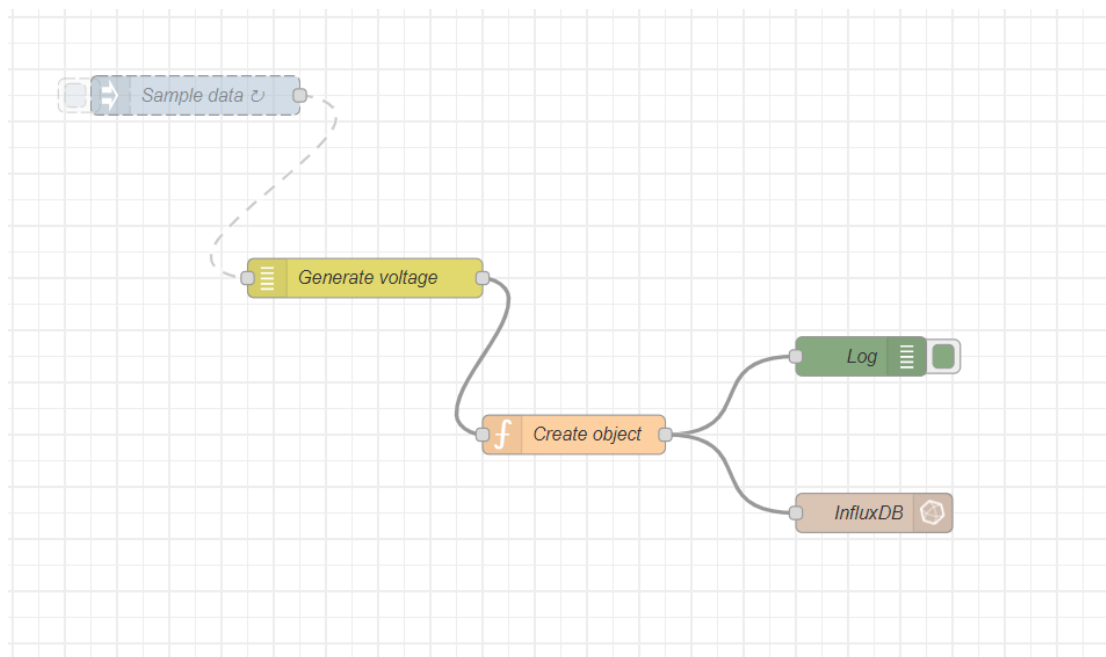
We are using InfluxDB to store our data. This is an instance of a so called Time-Series Database. It is optimized for storing lots of timestamped data, such as data from IOT devices. This fits perfectly in our project. The other container is a temporary service we're using. With NodeRed, we could simulate the process of data coming in to our database. This way, we had a realistic representation of our workflow would look like. It came in handy to generate

some dummy data so we could explore how InfluxDB handled this. Maybe we'll keep the container around, because it's mainly for testing purposes.

Overview of generated dummy data:



NodeRed flow used to generate sample data:



Something we weren't able to set up was the communication between the app and the database. We were using a GitHub repo we found that contained an InfluxDB-client for flutter, but we're having problems with using it correctly.

Moving forward, we will focus on setting up the NodeJS on our Raspberry Pi. This way, we could get the data from the webserver, which would be a little bit easier (because there is more documentation about that).

### 3 Sprint retrospective

The second part of this report contains our retrospective sprint. Similar to last retro, we used a tool called Miro where you can setup a board and everyone can fill in what they would like to say.

In the screenshot below you can see our board. If the text is too small, be sure to go to this our repo where we've also included an image of this board. (see docs/sprint2)

