Team Description

1. Team name
    - Team of Things
2. Team Members
    - DEFFRADAS Thomas
    - TCHEUPI KAMGA Xavier
    - WONG Kevin
3. GitHub usernames
    - Domoviye
    - KevinKyou
    - Tcheup

Project Description

1. Description

Temperature sensor who sends informations and data with **LoRa** technology.
We want to improve the retail solutions for this product.
With our project, it will be easier and faster to send and retrieve all the data from the sensor.
It could be used in a cluster to allow several sensors to send the data.
It will display the temperature on a display and also warn if there is a problem with a buzzer or a led.

(The data will be received by a Computer, then will be computed into files or by a program. The program could create alerts and others useful notifications/informations.)

2. Existing solutions

    - Existing solutions for retail are often too big and they aren't connected. If it sends informations, it uses Wi-Fi for an amount of data too low for the power consumptions of the object.

3. IoT Solution

    List of components :

    - LoRa module
        - ➢ **LINK : (1) 15,99 €** https://www.amazon.fr/MakerHawk-Transmission-Communication-Performance-Anti-interf%C3%A9rence/dp/B07GQQ5Q4W/ref=sr_1_5?__mk_fr_FR=%C3%85M%C3%85%C5%BD%C3%95%C3%91&crid=3V251GF0XG4U1&keywords=lora+arduino&qid=1574259399&sprefix=lora+ardui%2Caps%2C153&sr=8-5
        - ➢ ESP32 can be used if it's available in the starter kit from EFREI
    - Temperature sensor DS18B20
        - ➢ **LINK : (2) 7.49 €**

https://www.amazon.fr/AZDelivery-DS18B20-Capteur-Temp%C3%A9rature-num%C3%A9rique/dp/B01MZG48OE/ref=sr_1_6?keywords=DS18B20&qid=1574257848&sr=8-6&th=1

- Arduino board (**Available in the Arduino Starter Kit**)
- Display (**Available in the Arduino Starter Kit**)
- Led/Buzzer and small pieces (**Available in the Arduino Starter Kit**)

Our solution has a low power consumption and uses the right network to send data. That way, it is easily possible to add more devices to work in a cluster. Possible use in retail and cold chain industry.

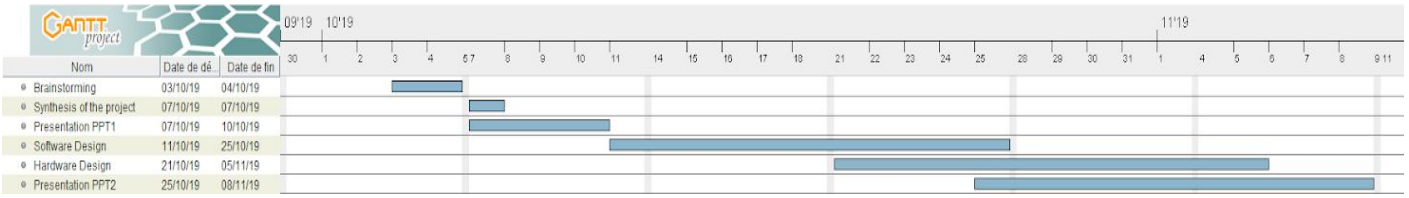
4. Norms and regulations

There is a norm linked to temperature sensor implied in food retail or retail involved in consumable products by the *World Health Organization*
LINK :
https://www.who.int/medicines/areas/quality_safety/quality_assurance/TS-temp-monitoring-final-sign-off-a.pdf

> “1.1.1 Temperature monitoring systems Air temperature monitoring systems and devices should be installed in all temperature-controlled rooms, cold rooms, freezer rooms, refrigerators and freezers used to store TTSPPs. Electronic sensors should be accurate to ± 0.5°C or better. Sensors should be located in areas where the greatest variability in temperature is expected to occur within the qualified storage volume and they should be positioned so as to be minimally affected by transient events such as door opening.”

The temperature sensor DS18B20 is perfect for our project since it has the requirements from the WHO guidance.

5. Gantt diagram



6. Global schema