Minutes

Location: Shed
Date: Tuesday 7th November
Not In Attendance: N/A

Attendance: Daniel Carl Beauchamp, Dharius Robinson, Natalie Mclaren

**What's Been Done since the Previous Meeting:**

- Flow chart of the process between taking a reading and sending to server.
- Engineering Menu
- Data format document (system codes)
- Collage of canterbury map and different river points along with their signals

**Topics discussed:**

- **Network:**
    - Dan Knox mentions that at times maps make assumptions out of terrains - misleading signals.
    - We might encounter some issues due to the terrain in Canterbury
    - Dan Knox suggests we use an Android app to help testing networks - although it does require your mobile has data.
        - How: write a sketch to send a message once a minute, then phones subscribe to that topic
    - Dan Knox reminds us that we have to cater for the possibility that we might have 4G but it might not be strong enough to send anything.

- **Engineering Menu feedback:**
    - Dan Knox changes 'get water level measurement' step to 'get distance measurement' instead.
    - Dan Knox adds a join request in the 'ping gateway' step.
    - Dan Knox removes 'show full log' and 'show month's log' steps as will be a lot of data that we might not need.
    - Dan Knox adds a 9th step - 'return calibration' - in the case we have a calibration curve for every device.
    - Dan Knox adds a 10th step - 'return temperature from sensor'. He explains that the sensor distance changes with temperature therefore we will need to know which temperature it is working in. We will need a small temperature sensor.

- **Back-end System feedback:**
    - Dan Knox suggests we use some sort of handler between Node.js and InfluxDB.

- **Diagrams:**
    - Rough drawing of journey between reading and sending to server:

        - Dan Knox suggests the possibility of having a pole in the water (with sensor in it but elevated).
            - Flaws: signals will start hitting the pole instead and won't reach sensor
            - Advantages: less debris as sensor is enclosed
    - Flow chart:
        - Dan Knox asks whether we are thinking of having someone set the location themselves as they install it - we confirm with yes.
        - Dan Knox suggests we have a concept of time on our device, so we can correlate stuff with the SD card. Device can ask server what time it is and clock on the device will use that time.

- **Status codes:**
    - Dan Knox explains we can bit mask to create values - make it more compact
    - Dan Knox questions whether we really need to report back millimietres?
    - Dan Knox suggests we give the unsigned int for water level a size - this way if we shift processors, it's always a known size.
    - Dan Knox says that what we send to the network should essentially be short and sweet - not as verbose as what we send to the SD card which will log error codes etc.

- **New LoRaWan spec:**
    - Dan talks about new spec coming out soon:
        - One new feature is a mac command for time - we can use this.
        - Another feature is improved security which we need to be aware of particularly because of the use of nonces. Can't be reused so we will need to remember which we have used otherwise it will get rejected.

- **Voltage:**
    - Dharius asks whether we will need some sort of voltage for the battery - does the arduino provide this?
        - Dan Knox confirms that it does - there is a resistor. We would be able to do an analog read to get the level. He suggests we create a step in the engineering menu to find out which battery is selected.

- **Sensor:**
    - Dan Knox gives us our sensor which recently arrived at the Shed.
    - He has soldered on a header to the sensor and suggests we read the data sheet.
    - Data sheet states pin 5 can be used for serial data.

**What's Being Done:**
More coding this week - all members agree to meet up again this weekend to focus on coding, particularly with the sensor.

Code design.

**Further Discussion:**