Minutes

Location: Shed
Date: Tuesday 10th October
Not In Attendance: N/A

Attendance: Daniel Knox, Daniel Carl Beauchamp, Dharius Robinson, Natalie Mclaren

What's Been Done since the Previous Meeting:
<Natalie>: Scenarios & some functional requirements
<Dharius>: Scenarios & some functional requirements
<Daniel>: Some functional requirements

Topics discussed:

- Design stages - Daniel K provides us with a sheet containing explanations of different design stages we should go through.
    - System Design:
        - Based on functional requirements.
        - Broken down components and how they interact with each other.
        - Flow chart
    - Architectural Design:
        - Based on System Design i.e.
            - For the sensor component - which ones are we using? Ultrasonic etc.
            - What kind of data will be sent?
                - What format? Are we using binary, json?
            - Work on integration tests.
            - What happens at long distance?
            - Is it stable enough (network)?
            - Integration Testing
                - Could be test cases at this stage i.e. testing wifi in canterbury.
    - Module Design:
        - Looking into the low level sensors - what is it doing? Is it taking a reading? - Different stages of operation:
            - Reading
            - Calibration
            - Etc.. (all stages of each component?)
        - Handling failures (communication requests) - what happens?
            - Keep asking constantly? (uses a lot of power)
            - Integrate jitters so that it is somewhat random?
        - Evaluating each single component from the Architectural stage.
        - Pseudo code.

- Daniel B mentions LoRaWan and the possibility of using it.

- Daniel K confirms it is available for us to use. Gateway side is done by them, we need to do the rest.
- Daniel K explains Architectural design example of LoRaWan:
    - Which chips to consider?
        - Micro chip 1
        - One using SPI
- Daniel B mentions using Arduinos as we all have one and will be easier to set up.
    - Very basic processor chips, so can be difficult to prototype with complex(ish) instructions.
- Daniel K explains it's not impossible but might be some downsides depending on which we use.
- Daniel K talks about documentation - at this stage it should be easy for everyone to read.
- To consider: what happens when we do get a signal in town but nothing is sending because of congestion?
    - Maybe setting up a Watchdog timer - reset after not completing instruction after expected time.
- Daniel K informs us of alternative communication options:
    - Iridium
- Daniel K - "rethink functional reqs" - really think about how many of such a component you realistically need or how often you need to use it.
- Daniel K suggests we look into Maxbotix for ultrasonic sensors.
- Daniel K talks about watertight issues we may encounter:
    - Not so much with water proof but shower proof if we mount ultrasonic.
    - Or what happens if it falls in the water?
- Debugging - could have some sort of SD card on it to log data in a txt file (Blackbox idea).
- Daniel K reviews our scenarios - suggests the first set of scenarios are better formatted/not as technical.

What's Being Done:
Meeting up on Thursday to work on the Systems Design stage together, and then delegating work for further design stages based on Systems Design.

Further Discussion:
How many sensors do we need to get a good picture of the state of water levels within a given area?

Design stage will require diagrams (Architecture decisions) including the sensor, power source, relay(?), detector (for the network availability?).

LoRaWAN is available in the shed (setup gateways) - XB port module version done by Dan K.