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IoT Air Quality Innovation Proposal

[Company name] | [Company address]

BLE IOt PROJECT PROPOSAL

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IoT Air Quality Innovation Proposal

# Problem Statement

This past year has been filled with restrictions and dangers due to the Pandemic. It is not safe to have many students grouped up in small spaces. With this project we aim to measure the quality of the air, PPM / VOC values, and display the data live using a Bluetooth Low Energy network.

# Main & Sub Research Question

# Research Strategies

# Air Quality Values per Zone

The idea of this project is to calculate the carbon dioxide levels in the floor of the school building. We will be using the ESP32 as a client and the Nordic Thingy:52, as well as the Raspberry Pi, as a Server. The idea was to collect as many values as possible and log them. Our proposal will be divided in steps:

1. Obtain the PPM values using an ESP from the Thingy:52
2. Obtain the PPM values using an ESP from multiple Thingy:52’s
3. Write the obtained values to the Raspberry Pi
4. Log the values from the Raspberry Pi to a database’
5. Visualize the values from the Raspberry Pi using D3js or Grafana

We want to use BLE in this project since we got acquainted with the GATT Server architecture. The Thingy:52 has an environmental service with multiple characteristics; each characteristic provides a sensor value that can describe the environment (Example: Temp, Hum, CO2…).

# Expansion Possibilities

This could be an interesting project for future Smart industry students to pick up. This semester was filled with unknowns and time was a constraint. Possible expansion possibilities are to create a meshed network with the ESP32’s and avoid centralizing the Raspberry Pi to be in range of all ESP’s. The code could be improved to be “Plug and Play” and it could be expanded by adding a camera and counting how many people are in the area with tensor flow (or other libraries). This could improve the accuracy of the “danger meter” as it could correlate the air quality with number of people in the area.

# Network Device Location Map Zone TQ5

Graphical user interface, application

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# Network Device Location Map Zone R10



# STAR Network Topology Zone TQ5

# STAR Network Topology Zone R10

