Air Quality Monitoring System

Phase 2: Innovation

After conducting comprehensive research into air quality monitoring systems, particularly in the industrial sector, we have identified that industries frequently handle hazardous gases that may inadvertently be released into the atmosphere, potentially resulting in accidents. As a result, we have arrived at the conclusion that our proposed solution holds significant potential to address the concerns outlined in the initial phase of our project, offering valuable assistance to industrial operations.

- To digitize the data gathered by the sensors, we employ a combination of the ESP32 and Arduino UNO.
- We have chosen to utilize this microcontroller exclusively since our project focuses on external factors, such as airborne particles, gases, temperature, and humidity. As a result, there is no requirement for a Raspberry Pi in our setup.
- The connection that we are going to use to transmit out data to cloud is as follows:
    - WIFI
    - BLE
    - LORA
    - ZIGBEE
- To proceed our idea we need the following sensors:
    - Particulate matter sensors (use to measure fine particulate matter in air)
    - Gas sensors (use to measure concentration of specific gas in air like co2,no2,co,o3,etc.)
    - Electrochemical sensors (use to detect chemical reaction between specific gases eg : ammonia + water vapor gives ammonium hydroxide which is a chemical)
    - Infrared sensors (used to measure the particles by measuring the absorption of IR light by gases)
    - Temperature and humidity sensor.
- Cloud platform
    - Beeceptor
- Protocols
    - MQTT
    - HTTP
    - AMQP
- Features
    - Real time info about the air quality
    - Real time alert if there is an unwanted increase in the air mixture.
    - Can be accessed easily through a mobile or web app