PROJECT 2 -AIR QUALITY MONITORING.

PHASE -1(PROJECT DEFINITION &DESIGN THINKING)

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1. PROJECT DEFINITION

1.1 AIM OF THE PROJECT:

Air is getting polluted because of the release of toxic gases by industries, vehicle emissions and increased concentration of harmful gases and particulate matter in the atmosphere. The level of pollution is increasing rapidly due to factors like industries, urbanization, increase in population, vehicle use which can affect human health. Particulate matter is one of the most important parameters having a significant contribution to the increase in air pollution. This creates a need for measurement and analysis of real-time air quality monitoring so that appropriate decisions can be taken in a timely period.

This paper presents real-time standalone air quality monitoring. Internet of Things (IoT) is nowadays finding profound use in each and every sector, plays a key role in our air quality monitoring system too. The setup will show the air quality in PPM on the webpage so that we can monitor it very easily.

In this IoT project, we can monitor the pollution level from anywhere using your computer or mobile.

2. DESIGN THINKING

2.1 WORKING PROCEDURES:

Node MCU plays the main controlling role in this project. It has been programmed in a manner, such that, it senses the sensory signals from the sensors and shows the quality level via led indicators. The DHT11 sensor module is used to measure the temperature and the humidity of the surroundings. With the help of the MQ-135 gas sensor module, air quality is measured in ppm. These data are fed to the Think Speak cloud over the internet. We have also provided LED indicators to indicate the safety levels.

STEP 1. Firstly, the calibration of the MQ-135 gas sensor module is done. The sensor is set to preheat for 24 minutes. Then the software code is uploaded to the

NodeMCU followed by the hardware circuit to calibrate the sensor has been performed.

STEP 2. Then, the DHT11 sensor is set to preheat for 10 minutes.

STEP 3. The result of calibration found in STEP 1 is used to configure the final working code.

STEP 4. The final working code is then uploaded to the Node MCU.

STEP 5. Finally, the complete hardware circuit is implemented.

2.2 COMPONENTS USED

HARDWARE COMPONENTS

1. NodeMCU V3

2. DHT11 Sensor Module

3. MQ-135 Gas Sensor Module

4. Vero board (KS100)

5. Breadboard

6. Connecting Wires

7. AC-DC Adapters

8. LEDs emitting green, yellow and red colours

9. Resistors

SOFTWARE COMPONENTS

1. Think Speak Cloud

2. Arduino IDE