Air Pollution Monitoring System:

Abstract:

The Internet of Things (IoT) might be a global network of "smart gadgets" that can detect their surroundings, connect to them, and communicate with people and other devices.

systems. One of the most important issues of our day is global air pollution. The amount of pollution has risen through time due to a variety of factors, including population growth, increasing vehicle usage, industrialization, and urbanization. These factors have negative consequences on human welfare by directly impacting the health of those exposed to the pollution. When the air contains enough dangerous gases including carbon dioxide, smoking, alcohol, benzene, NH3, and NO2, air quality suffers.

Introduction:

In addition to more and more gadgets that have lately acquired internet connectivity, it includes conventional computing devices like laptops, tablets, and smartphones. Examples include household items, vehicles, wearable technology, security cameras, and a wide range of other items.

A gadget has to have the ability to connect with other devices in order to be a member of the Internet of Things. As a result, it needs some kind of integrated wired or wireless connection. Although Wi-Fi is often supported by IoT devices, Bluetooth may also be used to transport data to other adjacent devices. As they are equipped to connect with other objects, IoT devices are sometimes referred to as "smart gadgets". Many IoT devices not only can speak, but they also include a variety of sensors that collect relevant data. The Internet of Things offers exciting prospects even if it is still in its early stages. The Internet of Things will eventually become less of an abstract concept and more of a way of life.

Methodology:

STAGE 1: Air Pollutant Level Detection

It denotes the beginning of the project.

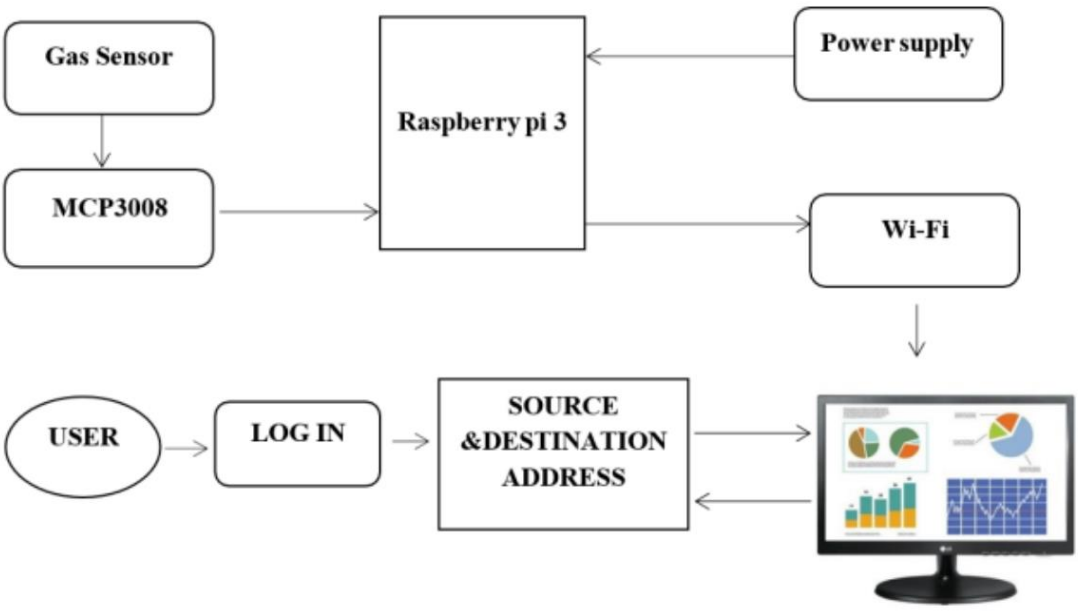
A kit for detecting air pollution via IoT is created. It deals with gathering data from gas sensors attached to Raspberry Pis, and then sending that data to a cloud platform for storage.

STAGE 2: Designing the user interface

Clarification of the many optional performance components is required at this level. The MCP3008 is a 10 bit converter with on-board sample and hold circuitry that is calibrated to transfer analog data to digital. The mobile application allows for the storage, processing, and monitoring of the acquired data. Via the app, users may examine the saved data.

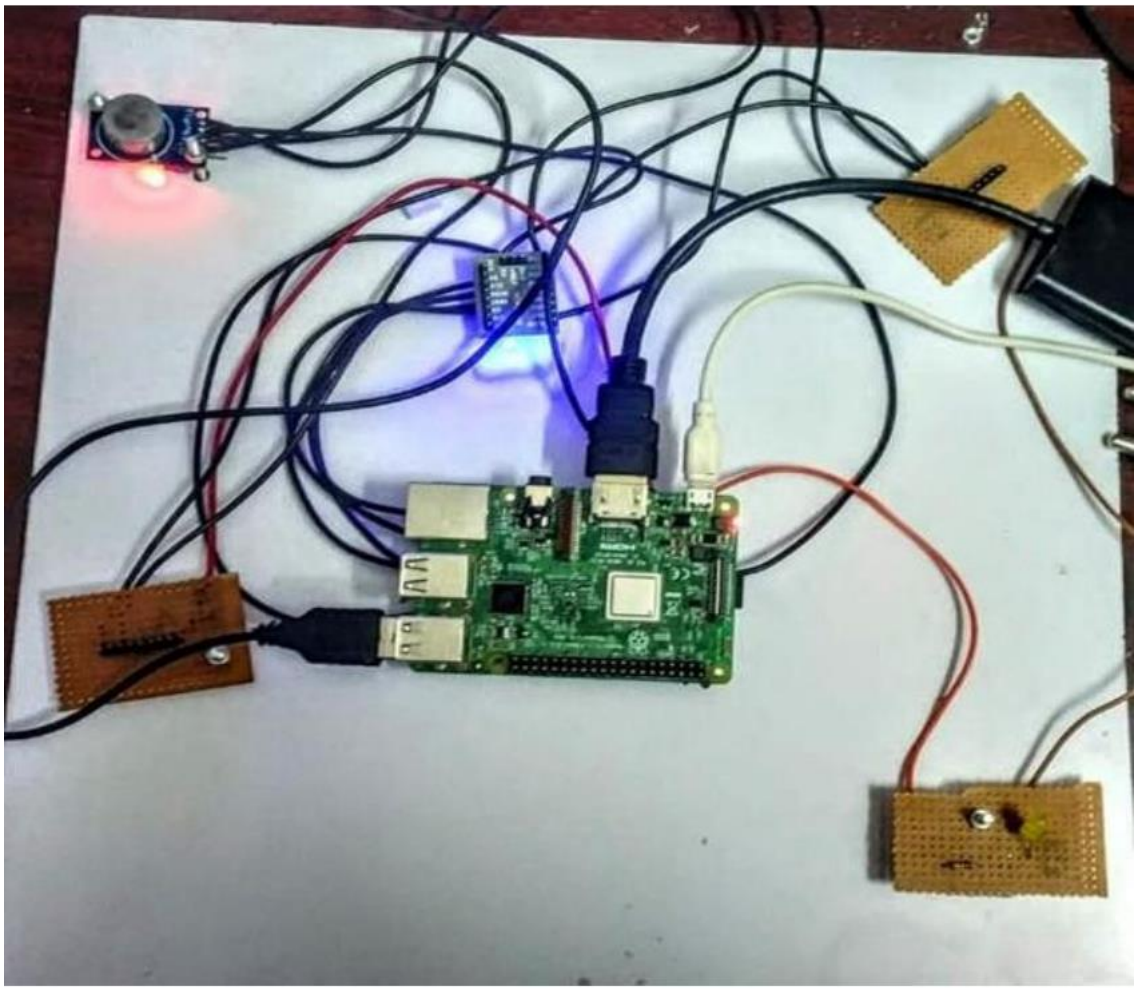
STAGE 3: Execution and testing comprise

With the use of various circuit designs, the components are interfaced together to create the project deliverables. The design is put through testing, debugging, and troubleshooting to see how it performs in different scenarios. A newer circuit design should be finished, put into practice, and tested if an older circuit design fails to pass the tests.



Hardware implementation:

The Raspberry Pi is necessary for the hardware implementation. Any microcontroller may connect to your Wi-Fi network using the self-contained System On Chip (SOC) known as the ESP8266 Wi-Fi Module. The 10-bit MCP3008 Analog-to-Digital Converter (ADC) is perfect for embedded control applications because it offers good performance and low power consumption in a tiny size. Gases including LPG, alcohol, propane, hydrogen, CO, and even methane may be measured using the MQ-2 Gas Sensor. The MQ-7 Gas Sensor measures CO concentrations in the air between 20 and 2000 ppm, and it also uses a cycle of high and low temperatures to detect CO when the temperature is low (heated by 1.5V). The conductivity of these sensors is increasing together with the increase in gas concentration.



Above picture depicts the overall assembly of the tools.

Software Implementation:

This phase provide the design of API and user needs to sign in by putting their details in order to use it.

Result and Conclusion:

As a result, the goal of our study is to evaluate the quality of the air pollution exposure level. The source and destination addresses are obtained from the user to create the mobile application. With that method, the pollutant level in this application is monitored. Also, it records the person's daily exposure to air contaminants. Our project was created to assist someone in identifying, tracking, and testing air pollution in a specific location. The kit includes a smartphone application that enables users to forecast the degree of pollution throughout their whole path. The integrated mobile application and the suggested air pollution monitoring kit can help consumers determine their exposure level to air pollutants. The app's features included real-time air quality indices, daily air quality reports depending on the user's travel distance, and location-based reporting for particular air quality measurements.

Our environment is mostly impacted by air pollution. not just having an impact on the environment, but also on human health. The smartphone application was created as a monitoring mechanism, measuring how much exposure a person has had each day. The detection of leakage gas, carbon monoxide, smoke, and propane was done using gas sensors. The sensor detects gases, converts them to digital data, and presents that data in the application. Calculating the exposure level in PPM (Parts per Million).

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