IOT BASED AIR AND WATER POLLUTION MONITORING USING RASPBERRY PI

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Abstract: With the tremendous increase in the level of population and mechanization pollution has increased many folds. This results in deterioration of individual health. There by directly affecting health of entire population. An IOT Based Air Pollution Monitoring System is proposed which will monitor the level of pollution over a web server using internet. Sensors can be deployed at various locations which can sense and collect data. The big data can be uploaded on the Google cloud which facilitates monitoring from any part of the globe. The presence of harmful gases like CO_2, Smoke, CO, Butane and LPG above a particular limit may turn fatal which can lead to severe accidents. This type of accidents can be prevented by implementing an effective pollution monitoring system. The air quality is displayed on the webpage which makes environment monitoring easy. So, here in my project, the main aim is to analysis various factors are responsible for air pollution.

Index Terms: **IOT, Wireless Sensor Network, Embedded Electronics, Zigbee, ADC, Environmental Monitoring, Pollution.**

I. INTRODUCTION

The IoT Pollution Monitoring System's major purpose is that air pollution is becoming a major issue these days. It is mandatory to monitor and manage air quality in order to ensure a brighter future and a healthy lifestyle for everyone. The Internet of Things (IoT) is gaining popularity as it has the potential to improve people's lives. Because of the rise in population and automobiles and industries, the weather conditions are deteriorating rapidly. Pollution can cause allergic reactions that cause infections and inflammation of the eyes, nose, and throat.It can also cause inflammation in the lungs, this may result to problems such as bronchitis, heart disease, pneumonia, lung disease, and aggravated asthma. A reliable monitoring system can address these pollution-related issues. Observing yields air pollutant concentration measurements, then be examined, interpreted, and conferred. Monitoring via an intelligent system the environment enables us to quantify the severity of air pollution, and can be utilized to identify methods for reducing it.

The Internet of Things (IoT) is nothing more than a combination of sensors and software with embedded electronics and Wireless Sensor Network (WSN) is the location where there is a lot of work being done. The work is not limited to one application but has many, including fire detection, smoke detection, water or gas leak detection, air pollution, humidity measurement, and many more.

The data gathered from local sensors can be sent to any distance where it can be seen, and further controlling action can be initiated if necessary. The WSN-based air monitoring system gathers information from the sensors' deployment area and displays it on the computer screen. Computer data can be sent to any terminal that is associated to the Internet. Thus, using IoT, long-distance data transmission can be accomplished, and analysis can be displayed by uploading information to the vendor of IoT services using various plots in UBIDOTS.

As a result, using IoT, pollution levels of the air and water on campus and even in cities can be monitored, and necessary advisories can be issued if necessary. In this project, we are utilizing the Raspberry Pi Board to interface with various sensors. When applied to industries, IoT is broadly classified as Industrial IoT. (IoT) Environmental stewardship and worker protection go hand in hand as time goes on as industry's performance and productivity. This paper focuses on pollution monitoring, which can be utilized in industries. Thousands of people work in the petrochemical and gas sectors around the clock. Many sorts of gases are produced as a consequence of the chemical reactions that occur during the refining process. If inhaled more than ppm, some of these can be fatal to humans. The leakage of substances such as butane, methane, CO_2, CO, and others should be monitored to prevent explosions and accidents.

LITERATURE SURVEY:

- Monitoring the combination of major air pollutant gases such as CO, NO_2 and SO_2.
- The Environmental air pollution leads to effects like global warming and acid rains. To avoid those situations pollution measurement is must.
- WSN focuses on environmental pollutants based on ZigBee protocol.
- This model is used for understanding the status of air pollution at the remote Place.

- It can provide an alarm and safety guideline depending on the condition of the context model.

FLOW CHART:
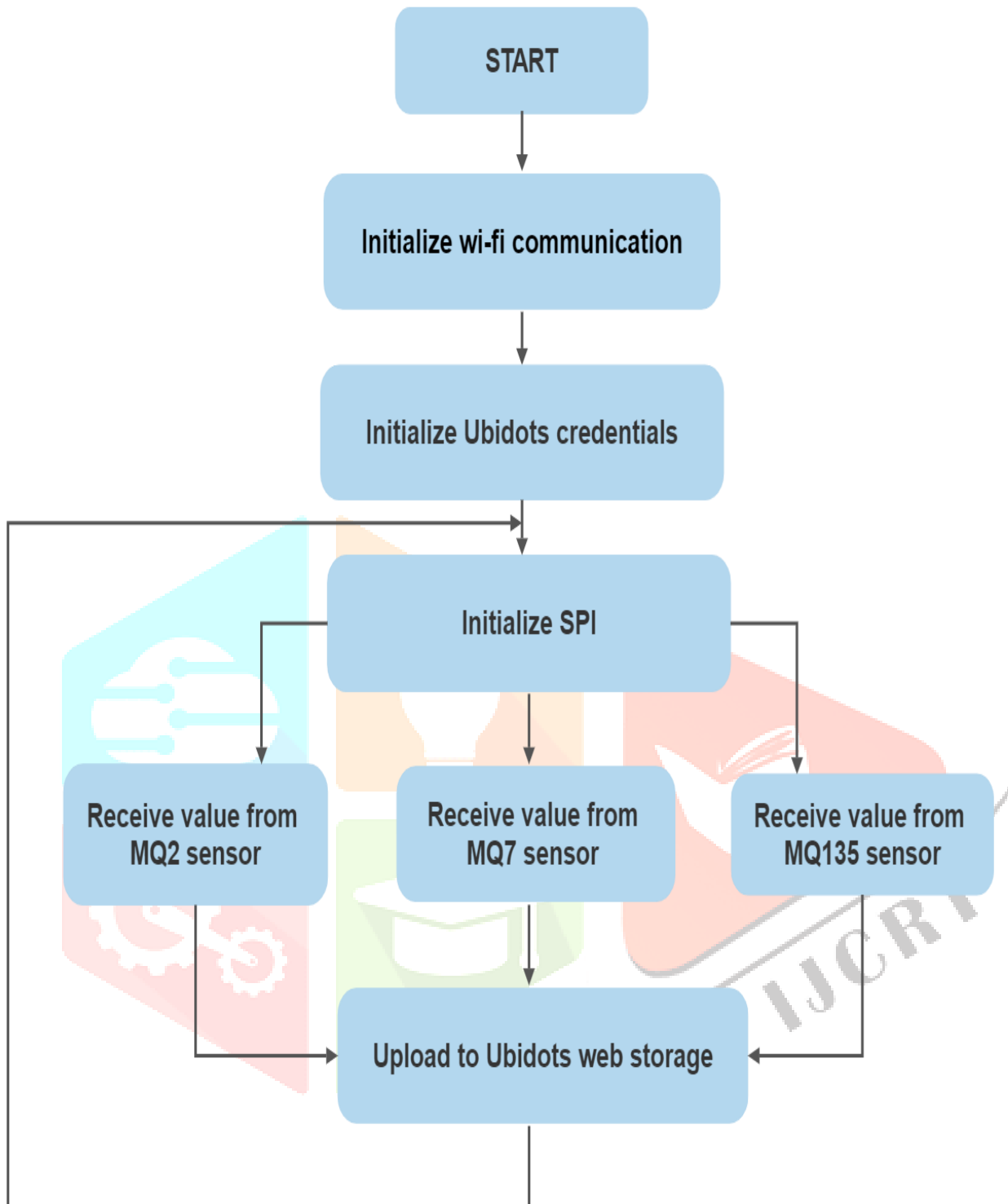
WORKING PRINCIPLE:

The various sensors are connected according to the schematic diagram. So, the sensor which detects the variations in environment detects values and visualized in Ubidots.

The MQ2 sensor consists of two layers of steel mesh called Anti explosion network.The heater avoids explosion when harmful gas is detected. The main principle in this sensor is when clean air is detected; the donor electrons in tin dioxide are attracted towards oxygen on the layer of sensing material. Thus, prevent current flow thereby increases the resistance.

But when reduced gases are absorbed the surface density of oxygen decreases and current flow increases thus resistance decreases. The Analog output voltage changes in proportion to concentration of gas.

MQ135 have potentiometer and LM395 op-Amp comparator. If the gas is detected, LED D0 turn on and digital pin will go from high to lowpH meter contains pH probe that passes electrical signals to the pH meter and it displays pH of the solution. It contains two electrodes, a sensor electrode and reference electrode. A silver wire coated with silver chloride is immersed in saturated solution and potassium chloride solution in reference electrode.When probe is placed in solution, the H+ ions accumulate around the bulb and thus because of exchange of ions the current flow occurs which generates some voltage. By comparison voltage corresponding pH values are detected.

All the sensor outcomes are Analog except DHT11 so connected to AtoD converter then digital values are sent to raspberry pi which send data to cloud by utilizing the internet and analysis of various parameters are done here.

RESULTS:

The proposed project can be used to look after a specific industry and measure air quality. The presence of various combustible gases can be checked. This primarily focuses on calculating gases like Carbon Monoxide (CO), Methane, Liquefied Petroleum Gas (LPG), Butane and Air quality. An experimental setup was formed to measure and monitor the gases. The sensor output observed were gathered and uploaded.

REFERENCES:

- ❖ Riteeka Nayak, Malaya Ranjan Panigrahy , Vivek Kumar Rai and T Appa Rao. IOT based airpollution monitoring system. Imperial Journal of Interdisciplinary Research, 2017.
- ❖ Arushi Singh, Divya Pathak, Prachi Pandit, Shruti Patil, Prof. PritiGolar. IoT based Air and SoundPollution Monitoring System, March 2017.
- ❖ PalaghatYaswanth Sai. An IoT Based Automated Noise and Air Pollution Monitoring System.
- ❖ International Journal of Advanced Research in Computer and Communication Engineering, March2017.
- ❖ https://www.tinkercad.com/
- ❖ https://circuits.io/
- ❖ https://www.arduino.cc/
- ❖ https://circuitdigest.com/ microcontroller - projects / iot -air-pollution-monitoring-using Arduino.