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IOT BASED AIR QUALITY INDEX MONITORING SYSTEM –MONITOR MQ135, AND CO USING ESP32

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Abstract *:* The idea of air quality monitoring is to give users a platform from which they can monitor the quality of the air around them. We shall be able to tell the status of the air we breathe due to the air quality monitoring system. The Internet of Effects is now finding widespread application in every industry, and it also plays a significant role in our system for monitoring air quality. This study focuses on the conception and implementation of an ESP 32-based IOT-based Air Quality Index Monitoring System that we planned to create. With the aid of several detectors, the setup will display the air quality in PPM, temperature, and moisture. It will also be presented on the IOT Platform. In order for everyone and everyone to monitor the air quality at the location where the system would be put, the dashboard of the platform must be set to public. By doing so, we can use a computer or a mobile device to cover it truly fluently. The purpose of our design is to conceal our landscape by controlling the discharge of hazardous feasts that are emitted by vehicles and other sources of diligence. We are able to take the required precautions whenever necessary because we are given real-time information regarding the quality of the air.

IndexTerms: MQ 7 Sensor, MQ 135 Sensor, DTH 11, ESP 32

INTRODUCTION

One of the most important components in a person's life is air. In today's world, air pollution is growing at an alarming rate, which causes climate change, which has negative effects on everyone. Because of industrial emissions of toxic gases and automobile emissions, which raise the concentration of hazardous gases and particulate matter in the atmosphere, the air around us is becoming more and more polluted. Both land and marine life are at risk from the emigration of numerous harmful substances from people and objects. Poor air quality is causing an increase in health issues like heart disease, lung cancer, respiratory diseases, and stroke. Children, asthmatics, expectant mothers, and elderly persons are particularly at risk from poor air quality. Our buildings and monuments are collapsing as a result of these contaminants. Consumers need to become aware of how much their air conditioning influences air quality. According to statistics, air pollution causes millions of unexpected deaths each year across the globe. Particulate matter has a significant contribution to increasing air pollution, according to research. Thus, one of the main sources of concern in the globe today is air quality. So, it's essential to continuously cover the air quality indicator to ensure that our surroundings are healthy and, consequently, worth living in.

Block diagram:

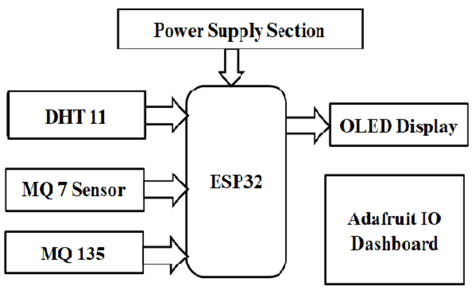

Figure 1: Block diagram

Methodology:

Our Internet of Things-based air quality monitoring device is very accurate, simple to use, and reasonably priced. Analog pins 32 and 34 of the ESP32 are linked to MQ135 and MQ7, respectively. ESP32's digital pin 2 is coupled to the DHT11 device. The buzzer is attached to ESP32's digital pin 18 (or 18). So, only when the small particles are in the hollow detecting area can they be detected and, consequently, the proper values may be obtained. The output, which is expressed in mg/m3, was computed using the Dust density characteristics curve.It is necessary to warm and then calibrate MQ135 and MQ7 before using them. Preheating entails providing a 5V power source for at least 24 hours because they operate on the heating principle. These must be translated to PPM using their individual sensitivity characteristics curve because they produce output in voltage levels. We measured the CO2 concentration using MQ135. The air contains 250–400 PPM of CO2: Normal. Usual with good air exchange: 400 to 1000 PPM.Poor air if more than 1000 PPM. As is also common knowledge, the ideal range for CO2 in our atmosphere is between 390 and 450 PPM. The buzzer would begin to ring as soon as the CO2 concentration exceeded 1000 PPM. We measured the CO content using MQ7. The relationship between CO levels in the air and potential health issues is 0–9 ppm: normal CO levels, no danger. Chronic issues with long-term exposure at 10-29 ppm.In particular at levels of 300-400 ppm or above, CO causes severe symptoms, terrible headaches, brain damage, coma, and/or death. The gadget needs to be connected to the internet in order to display the real-time air data at the site where the system will be installed on the dashboard from anywhere in the globe.

Result:

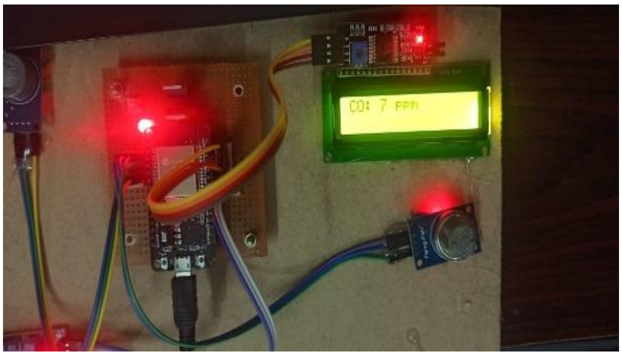

Figure 2: output of CO(MQ 7)

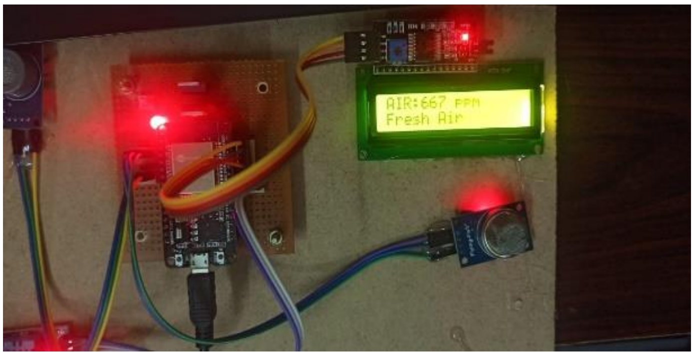

Figure 3: output of air quality(MQ 135)

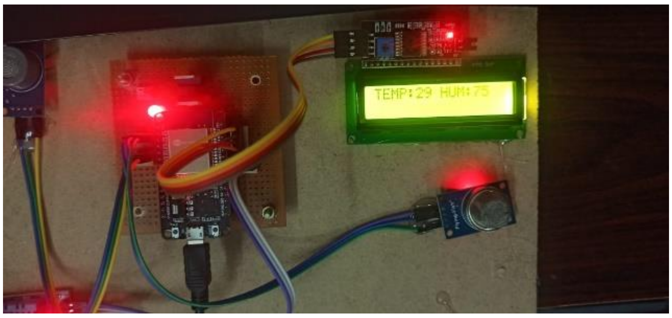

Figure 4: Output of temperature and humidity Figure 5: Output of air quality monitoring system on Adafruit IO dashboard

Conclusion:

This project suggests a system that uses specialized sensors to monitor air quality in real-time on a small scale, consumes little power, and is very accurate. The system notifies users when the air quality exceeds a certain threshold and presents the data in an easily understandable manner. By utilizing the IOT concept, anyone with a phone or computer from anywhere may monitor the air around the installed system. The users are able to act quickly when necessary because to the data's constant update. This aids in reducing air pollution, which is a major concern in the area surrounding us. In addition to being inexpensive and energy-efficient, it takes lesser space and can be installed anywhere. This offers significant flexibility and efficiency.

Future scope:

One way to use this kind of technology is as a standalone device, as it is in the example above, or it can be installed in automobiles. By putting it in cars, you can educate and inform drivers about their driving habits and how they affect the environment and contribute to pollution. An overall decrease in emissions will result from developing improved driving practices. Lowering pollution will help both them and other people because everyone would be able to breathe cleaner air. Future upgrades to the system could include the addition of additional sensors. Additionally, we can change the system by including a feature that notifies the user through SMS when the amount of any gas in the environment surpasses a predetermined level. These techniques can also be used on a massive scale to create smart cities.

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