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A Recent Trend of Oxygen Monitoring System to Evaluate Average Life Time of Human in Mines and Caves

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ABSTRACT: With growing traffic and population density, rising global temperatures, and abrupt climate change, air quality is one of the critical variables that must be regularly and in-the-moment evaluated in today's environments. Over 90% of miners and cave workers spend their days working in these spaces, where air pollution levels frequently exceed those of the outside world. For employees in particular, this is true. In order to estimate the typical human life in mines and caves, an IoT-based oxygen monitoring system is proposed in this study. The system outputs the predicted average life expectancy as well as the oxygen content in mines and caverns. When there are gas leaks, uncontrolled fires, excessive temperatures, or moist conditions, it is critical to recognise them and take appropriate action as quickly as feasible. The system makes use of a Node MCU ESP8266 Board, as well as numerous sensors and relays. The temperature and humidity inside are detected using a DHT11 Sensor. The Air Quality Index is observed with the MQ-135 Gas Sensor (Gas). The fire was discovered using a flame sensor. All sensor data is tracked by the Blynk software. When the gas level reaches an unhealthy level, the motor pump is employed to pump oxygen within. When a problem occurs, the Blynk App's instructions send an emergency notification to the IoT application and the consensus mail address. The user's information is tracked and updated via the cloud-based website BLYNK app.

KEYWORDS: - Oxygen, gas values, air quality.

I.INTRODUCTION

Currently, many hardware and software solutions in the technology sector have been created to support and even save human life. Even though these hardware and software are frequently used to enhance human life and turn human labour into a machine, they are also systems that have the ability to stimulate and interfere with human life in order to protect it and detect potential harm. In the modern era, devices with internet connections that can connect to the internet network wirelessly or through wired connections have developed into electronic systems that can exchange and analyse data. This project allows for the calculation and communication of the remaining life expectancy of those who are abandoned in an environment without access to oxygen to both the screen and exterior accessible settings.

As there aren't many sources that can offer information on local air quality levels in real-time scenarios or numerous analysis results to demonstrate how the quality of the air affects individuals, there aren't many sources that can. It is important to understand the air quality and the elements contributing to air pollution. There are a wide variety of air quality sensing devices on the market that may be used to measure the air quality and the amounts of contaminants in the environment. The local air quality monitoring online services' air quality services are the other means to learn about the information about the air quality. Information about air quality is provided through a number of websites and online applications

II. RELATED WORK

A. AIR QUALITY MEASUREMENT SYSTEM

These days, air pollution poses a severe threat to the health of people, animals, and plants. It is crucial to understand the causes of air pollution and the precautions that should be done to safeguard our health. The indoor air quality and the outdoor air quality are the two types of air quality that are of concern. The quality of the air inside of structures including homes, workplaces, schools, etc. is referred to as indoor air quality. While the term "outdoor air quality" refers to the air quality outside of buildings or in the surrounding environment. Standard organisations like the US Environmental Protection Agency, the World Health Organization, ASHRAE, etc. have conducted several research on the quality of the indoor and outdoor air. According to every study, interior air pollution is higher than outdoor air pollution. Yet, there are not many sources that give consumers access to local air quality levels in real-time scenarios together with measurement proof. There are numerous elements that contribute to air pollution, including harmful compounds emitted by chemical plants, hazardous gases from industry, and pollutants from vehicle exhaust, among others.

B. MINES AND CAVES AIR QUALITY

Because workers spend up to 90% of their workdays in mines and caves, this environment is particularly significant in terms of how it affects their health. Aside from that, indoor air pollution levels can be up to 100 times higher than outdoor levels in some cases. "The presence in the atmosphere of a foreign substance composition of normal or important change in the proportions of its component, which can be detrimental and/or directly or indirectly cause impacts on health," according to the definition of air pollution. The World Health Organization (WHO, 2016) claims that breathing filthy air can lead to a number of health problems, from minor discomfort to fatal diseases. Chronic respiratory illnesses, which include lung and airway diseases, have been demonstrated to be made worse by poor air quality (WHO, 2016). Biological, chemical, particle, and aerosol pollutants are the main categories of pollutants that can have an impact on IAQ. Bacteria, fungi, pollen, and animal dander are all examples of biological pollution. Adhesives, cleansers, solvents, combustion byproducts, and emissions from floor or wall coverings are examples of chemical pollutants. Particles and aerosols are solids and liquids that are suspended in the air due to combustion, dust, or building activity. The stressors covered for this study's aims will include particulate matter, ultrafine particles, and comfort factors. temperature and humidity levels.

C. MINES AND CAVES AIR QUALITY CONTROL

It is important to check in advance the measurement agents' and equipment's assurance. Follow the instructions while performing the calibration. It is advised to keep a note of the manufacturer's details, including the serial number and any distinctive identification. The quality control plan should include instructions on sample preparation, handling, equipment calibration, data management, and other topics. To prevent contamination and deterioration, the information regarding storage and treatment should be documented.

III. EXISTING METHOD

In terms of both software and hardware, several technological advancements have been made recently in order to improve and even save human life. The remaining future of a group of individuals who have been abandoned in an area without access to oxygen can currently be determined and prepared for in both screen- and outside-open circumstances. In especially for those who are claustrophobic, this impact is significantly greater and negatively affects the amount of oxygen in that atmosphere. A person who is abandoned has no idea how long they will live and assumes that the air will be consumed rapidly. As a result, people have psychological or physical repercussions, such as fast breathing or panic-induced self-harm, and even those who are able to survive as a result of these effects pass away before their time. With this upgraded system, it is guaranteed that everyone remaining inside may know how much time is left instantly, live for the period allotted, avoid unnecessary frenzied awareness, and steer clear of changes that will negatively affect the amount of oxygen in nature. Both the person inside the enclosed space and the user outside are

alerted at the same time by rapid dips in oxygen levels; it is important to maintain stability so that the survival period can be prolonged.

The remaining lifespan of a human can be determined using an Arduino-based life span calculation system via oxygen content, which uses a method to measure oxygen rate inside. By keeping track of the victim rate, this project will assist in raising the standard of service in the rescue system. Depending on how many people are present indoors, different amounts of remaining life are possible.

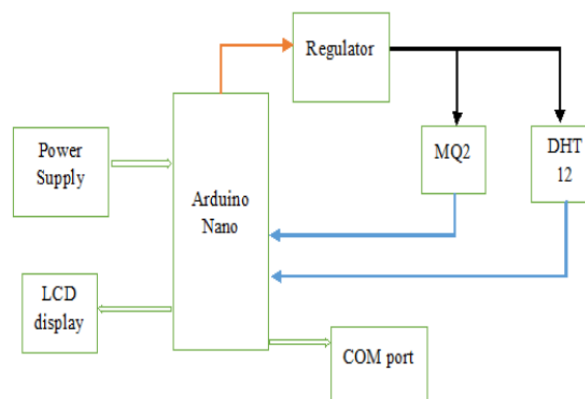


Fig.1.Existing Method Block Diagram

IV. PROPOSED METHOD

Air allows our living world to breathe; it is a combination of gases that fills the atmosphere and sustains the plants and animals that give life to the globe and keep it so alive. Generally speaking, air is mostly composed of two gases (78 percent nitrogen and 21 percent oxygen), with very trace amounts of a few other gases (such as carbon dioxide and argon) present. What separates "harmless" from "pollution" chemicals in the air is their quantity (or concentration). Indoor Air Quality (IAQ) is the term used to describe the air quality inside and around mines and caverns. More importantly, it has to do with the employees' health and comfort. Identifying and limiting common indoor contaminants can assist to lower the likelihood of indoor health issues.

In order to estimate the average human life expectancy in mines and caves, this study suggests an indoor Internet of Things-based oxygen monitoring system. This system includes sensors like the MQ135 Gas Sensor, as well as temperature, humidity, and flame sensors. The MQ135 Gas Sensor is used to gauge the air's concentration of NH₃, NO_x, alcohol, benzene, smoke, and CO₂. A humidity sensor is used to gauge and keep track of how much moisture is in the air. Devices called temperature sensors are employed to gauge the temperature of gases, liquids, and solids. A flame detector is a sensor that recognises the presence of a flame and takes action. These detectors can pick up smoke from an open fire as well as smokeless liquid.

Every sensor data is monitored through the Blynk application. The motor pump is used to pump oxygen into the building when the gas level gets too high. The Blynk App command notifies the IoT application and the consensus email address of an emergency if a problem arises. The user's data is monitored and updated by the BLYNK app, a cloud-based website.

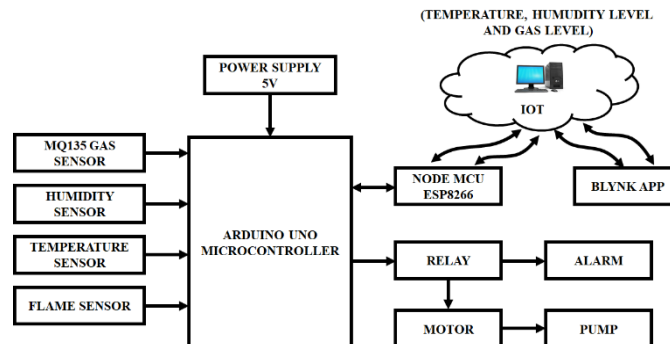


Fig.2.Proposed Method Block Diagram

V. EXPERIMENTAL RESULTS

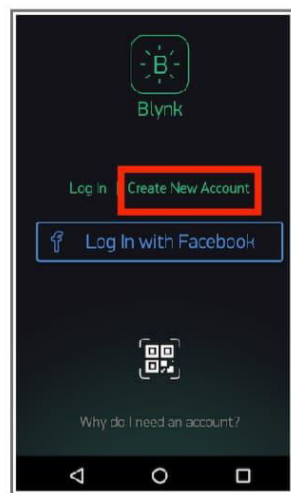


Fig.3.App Outlook

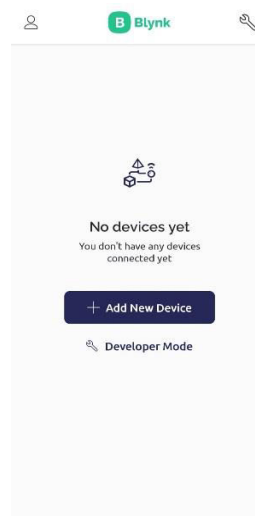
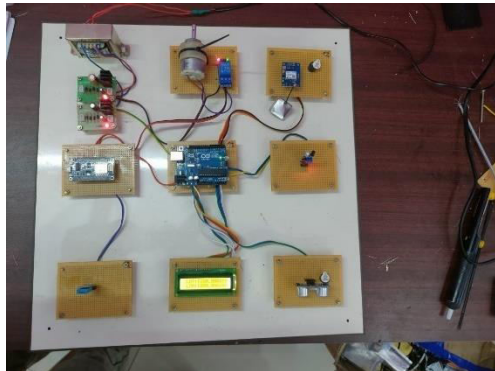


Fig. 4.After Login

After the login the device is added.The result is showed after the proecess through blynk app.The device is monitored through the app.If any problem occurs ,the app will show alert notification.



5.Kit Of Project



6.Results Of Scanning



7.Alert Notification

VI. FUTURE SCOPE

The safety of workers and explorers in mines and caverns is significantly improved by the installation of oxygen monitoring systems. The system should have sensors that are placed in strategic locations all throughout the space to continuously track the oxygen levels. Any drop in oxygen levels should be able to be detected by these sensors, alerting staff to take urgent action. Moreover, a central monitoring station where the system's data from sensors may be seen in real-time should be included. In order to alert workers and explorers to any harmful oxygen levels, the system should also contain alarms that can be heard throughout the mine or cave. The system must be built to be trustworthy and resilient enough to resist the challenging conditions that are frequently present in these situations. To ensure the security of everyone who enters these locations, an efficient oxygen monitoring system for mines and caverns should be comprehensive, strong, and simple to use.

VII.CONCLUSION

The IoT-based oxygen monitoring system was demonstrated in this research to assess the average human life expectancy in mines and caves. The device's desirable performance and indoor air quality monitoring's accuracy are confirmed. The main objective of this project is to create a prototype for an Internet of Things-based indoor oxygen monitoring system. The web server may also be quickly expanded, making it simple to apply to different contexts by incorporating the right monitoring sensors. Gas leaks, uncontrolled flames, hot temperatures, and wet surroundings should all be found and dealt with as quickly as feasible. The amount of oxygen present indoors and the estimated typical lifespan. All sensor data can be monitored using the Blynk app. When the gas level reaches an unhealthy level, the motor pump is employed to pump oxygen indoors. The Blynk App's instructions send an emergency notification to the IoT application and the consensus mail address whenever a problem occurs. Information about the user is tracked and updated via the cloud-based website BLYNK app.

REFERENCES

- [1]. Sung W T and Hsiao S J, Building an indoor air quality monitoring system based on the architecture of the Internet of Things, EURASIP Journal on Wireless Communications and Networking, pp.1-41, 2021.
- [2]. Ramson S J, León-Salas W D, Brecheisen, Z, Foster EJ, Johnston C T, Schulze D G, Filley T, Rahimi R, Soto M J C V, Bolivar J A L and Malaga M P, A self-powered, real-time, LoRaWAN IoT-based soil health monitoring system, IEEE Internet of Things Journal, 8(11), pp.9278-9293, 2021.

- [3]. Patil K, Laad M, Kamble A and Laad S, A consumer-based smart home with indoor air quality monitoring system. IETE Journal of Research, vol. 65, no. 6, pp.758-770, 2019.
- [4]. Hung C H, Fanjiang Y Y, Lee Y S and Wu, Y C, Design and Implementation of an Indoor Warning System with Physiological Signal Monitoring for People Isolated at Home. Sensors, vol. 22, no. 2, pp.590, 2022.
- [5]. Marques G, Ferreira C R and Pitarma R, Indoor air quality assessment using a CO2 monitoring system based on internet of things, Journal of medical systems, vol. 43, pp.1-10, 2019.
- [6]. Tran V V, Park D and Lee Y C, Indoor air pollution, related human diseases, and recent trends in the control and improvement of indoor air quality, International journal of environmental research and public health, 17, no. 8, p.2927, 2020.
- [7]. Shivleela Patil, Dr. Sanjay Pardeshi, Apr-2018, "Health Monitoring system using IoT" International Research Journal of Engineering and Technology, vol. 05, no. 04, pp. 1678.
- [8]. Ahmed Abdulkadir Ibrahim, Wang Zhuopeng, January 2018, "IOT Patient Health Monitoring System", Journal of Engineering Research and Application, vol. 8, no. 1, pp.77-80.
- [9]. Prajoona Valsalan, Tariq Ahmed Barham Baomar, Ali Hussain Omar Baabood, "IOT Based Health Monitoring System", Journal of Critical Reviews, Vol. 7, no. 4, 2020.
- [10]. U. U. Tariq, H. Ali, L. Liu, J. Hardy, M. Kazim and W. S
- [11]. Mohammad Monirujjaman Khan, Turki M. Alanazi, Amani Abdulrahman Albraikan, Faris A. Almalki, "IoT-Based Health Monitoring System Development and Analysis", Hindawi Security and Communication Networks, Vol. 2022, pp-11, 2022.
- [12]. Ahmed Kassem, Mohamed Tamazin and Moustafa H. Aly, "A Context-Aware IoT-Based Smart Wearable Health Monitoring System", IEEE, 2020.

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