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IoT Based Smart Industrial Monitoring and Alerting System

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Abstract: *Nowadays, gas leakage is major issue in the home and as well as industries It is used to reduce the risks in industries and kitchens by using internet of things The accidents can be avoided by using IOT technologies like monitoring the entire kitchen and restaurants areas by using mobile TELNET app. The cloud collects and stores large amounts of data from various IoT devices, such as sensors, machines, and equipment. This data is used for monitoring, analysis, and decision-making. Some sensors are used to monitor the different parameters like temperature and humidity sensors (LM35), flame sensor, gas sensor (MQ3), Wi-Fi module (ESP8266). The sensors all are collect their information in their respective fields and sends the data to the Wi-Fi module and it will perform. Microsoft Azure IoT Hub is a managed service that enables reliable and secure bi-directional communication between IoT devices and the cloud. It supports multiple protocols, including MQTT, AMQP, and HTTP.*

Keywords: Arduino, Wi-Fi module, LM35, flame sensor, Cloud

I. INTRODUCTION

Internet of Things (IoT) is an ideal buzzing technology to influence the Internet and communication technologies. IoT allows people and things to be connected anytime, anyplace, with anything and anyone, by using ideally in any path/network and any service. This project introduces a thought or an idea for home computerization utilizing voice acknowledgment, also the development of a prototype for controlling smart homes devices through IoT and controlling of dumb devices through IoT by the means of Wi-Fi driven chipset solution – ESP8266. This is also acknowledged by the need to give frameworks which offers help to matured and physically impaired individuals, particularly individuals who lives alone. Smart home or home automation can be said as the residential extension of building automation, it also involves the automation and controlling of lightings, ACs, ventilation and security which also includes home appliances such as dryers/washers, ovens or refrigerators/freezers which uses Wi-Fi for monitoring via remote for ease of use. Now a day's speed of the processing and communication through smart mobile devices at very affordable costs, to improve the lifestyle concept relevant to smart life, like smart T.V, Smart cities, smart phones, smart life, smart school and Internet of Things.

Internet of Things (IoT)

The term "Internet of Things" has come to describe a number of technologies and research disciplines that enable the Internet to reach out into the real world of physical objects.The Internet of Things, also called The Internet of Objects, refers to a wireless network between objects From any time, any place connectivity for anyone, we will now have connectivity for anything When a devices or things are connected to the internet, any device or thing can be able to monitor, share and communicate with any other device that is connected to internet.

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Block diagram:

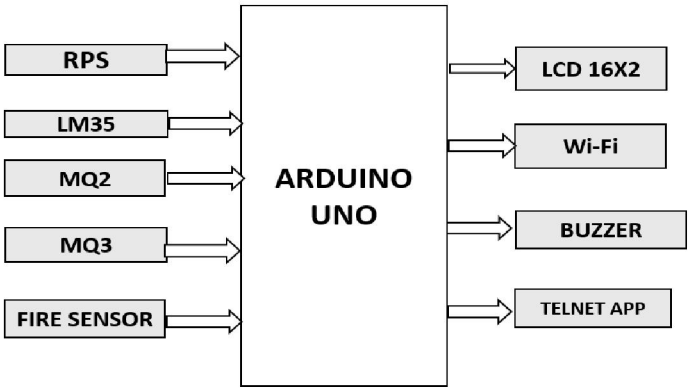

Figure 1 Block diagram

In the IoT Based Smart Industrial Monitoring and Alerting System described, IoT technology is utilized to create a network of interconnected devices (sensors, microcontrollers, and display units) that gather, process, and transmit appliances related data in real-time. IOT changes Life of human beings. Natural gas is an energy source that is commonly used in industrials and homes for cooking and heating. Financial loss as well as human injuries are happened due to accident cause by gas leakage. To detect the gas leakage and alerts in an industrial and homes.in industrial sector, safety and security are given more importance.

We tackled the issues in our research by testing each of the information collected by the sensors, we use and finishing the analysis using thinker system. Controlling can be done automatically or manually. the system is developed with embedded sensors, controllers and some IOT based software. Some sensors are used to monitor the different parameters like temperature and humidity sensors (LM35), flame sensor, gas sensor (MQ3), Wi-Fi module (ESP8266). The sensors all are collect their information in their respective fields and sends the data to the Wi-Fi module and it will perform.

II. SMART INDUSTRIAL MONITORING AND ALERTING SYSTEM

The IoT-based smart industrial monitoring and alerting system is designed to monitor industrial equipment and processes in real-time, detect anomalies, and send alerts to operators and managers. The system utilizes IoT technologies, such as sensors, cloud computing, and machine learning, to improve industrial efficiency, safety, and productivity Smart Industrial Monitoring and alerting system used to reduce the risks in industries and kitchens by using internet of things The accidents can be avoided by using IOT technologies like monitoring the entire kitchen and restaurants areas by using mobile **TELNET** app. The cloud collects and stores large amounts of data from various IoT devices, such as sensors, machines, and equipment. This data is used for monitoring, analysis, and decision-making.

some sensors are used to monitor the different parameters like temperature and humidity sensors (**LM35)**, flame sensor, gas sensor (**MQ3**), Wi-Fi module (**ESP8266)**. The sensors all are collect their information in their respective fields and sends the data to the Wi-Fi module and it will perform. Microsoft Azure IoT Hub is a managed service that enables reliable and secure bi-directional communication between IoT devices and the cloud. It supports multiple protocols, including MQTT, AMQP, and HTTP.

The IoT-based smart industrial monitoring and alerting system works by collecting data from industrial equipment and processes through sensors and devices, transmitting it to a cloud-based platform or local server, and analyzing it using machine learning algorithms to detect anomalies or faults. Alerts are generated and sent to operators, managers, and maintenance personnel, enabling quick response and corrective action.

The system is expected to deliver significant benefits, including reduced downtime, improved efficiency, enhanced safety, and increased productivity. By leveraging real-time monitoring and predictive maintenance, the system optimizes equipment performance, reduces energy consumption, and enables data-driven decision-making. The system also detects potential safety hazards and alerts personnel to take corrective action, ensuring a safer working

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environment. Overall, the IoT-based smart industrial monitoring and alerting system is designed to improve industrial operations, reduce costs, and enhance overall efficiency.

IIII. EXISTING SYSTEM

The GSM based gas leak alert system with multiregional sensors has been designed, constructed and tested. This requires no active internet connection. The next system consists of a wireless safety device for gas leakage detection. This sensor detects a change in gas concentration, it activates and audiovisual alarm and sends a signal to the receiver module.

Existing System Features:

- Real-time monitoring of industrial parameters
- Predictive maintenance and anomaly detection
- Automated alert and notification system
- Data analytics and visualization
- Remote monitoring and control
- Integration with existing industrial systems (SCADA, MES, etc.)
- Security features (authentication, encryption, access control)

IV. PROPOSED METHOD

The data stored on the database server is transferred to the website time to time Status of the is checked continuously for any uneven conditions We use LAN as database for scalability. The industry person who will check the status of the industry through website. We have to login using user id and password to get access to the website, this ensures the security of the data. The physical traits of temperature and humidity, light and gas molecule attention are detected within the restaurants and industrials surroundings and saved on the cloud those outcomes may be plotted at the telnet site or app, and that they may be stored for later exam. If there any doubt, swift movement can be taken.

Telnet is an open-supply net of gadgets utility and API for storing and retrieving data from matters over the net or via a local area community utilizing the HTTP and MQTT protocols. telnet offers channels for storing statistics retrieved using IOT technologies. When the value of the sensors reaches a certain threshold, an alarm message will be delivered to telnet app users. It will supply the values displayed on the LCD display in each unit before sending the alarm message, as well as the buzzer sound for the alert message.

V. SOFTWARE EMPLOYED

In the development of Intrusion Detection System for Smart Home Security, the Arduino Software IDE plays a central role. This open-source platform provides an intuitive interface for writing, compiling. and uploading code to Arduino-compatible microcontroller boards. Developers utilize the Arduino IDE to write code that interfaces with sensors, processes data, and controls other system components. Once the code is written, it is compiled into machine-readable instructions and uploaded to the microcontroller board, such as the Arduino Nano, via a USB cable. For data storage, visualization, and analysis Intrusion Detection System for Smart Home Security often integrate with Telnet, an IoT platform.

VI. RESULTS AND DISCUSSIONS

When power supply is given to the Arduino UNO all the sensors get activated in the Arduino connected to the Telnet app. whenever the gas or smoke leakage happens in the restaurants and kitchen automatically the sensors Collects the data through Sensor displays the data of room temperature and sends the alert notification to the user through the mobile telnet app. The user immediately take the action and responds about the incident h the Arduino. Overall, the system demonstrated its potential to transform industrial operations, improving efficiency, safety, and productivity while

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reducing costs. The results highlight the potential for widespread adoption of IoT-based monitoring and alerting systems in industrial settings.

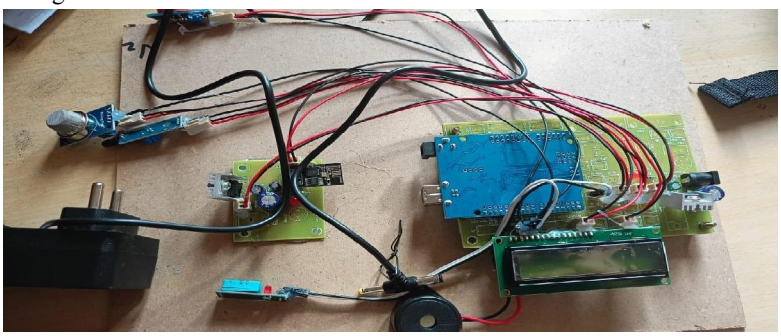

Figure 2 Before giving commands

Figure 3 Mobile Telnet App

Figure 4 After giving commands

VII. CONCLUSION

Hence this system can be used in homes and public Building such as hotels and restaurants. Smart industrials and kitchens Provide you all the automation features and that includes Safety features over a gas leakage detection System. To detect the gas leakage and alerts in an industrial and homes. The system's ability to integrate with various devices, machines, and sensors has made it possible to collect and analyze vast amounts of data, providing valuable insights into industrial operations. This project is declared that IOT applications will reach so a lot and wired into each side of the globe.

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