IOT BASED INDUSTRIAL MONITORING SYSTEM

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Abstract - The Internet of Things (IoT) is a new sector that aims to connect "things," "people," and "machines" to the internet. Modernization and automation are sweeping the globe, with IoT-based industrial monitoring solutions at the forefront. The importance of assessing the state of the industry is vital to the safety and efficiency of the products. The goal of this study is to create an IoT-based industrial monitoring system with intelligent sensors. Because of the integration of big data, the Blynk app can be used to monitor status from anywhere on the planet. Data analysis has been streamlined, allowing for easier IoT monitoring. The proposed technology could be beneficial to manufacturing industries. Adding technology to any kind of manufacturing industry will assure the safety and well-being of the people as well as prevent accidents. Using automation technology reduces the chances of loss and accidents in the machinery world.

Key Words: Wi-Fi module, sensors, ATmega 328, MQ-2 Smoke detector, Temp and Humidity Monitor

1.INTRODUCTION

Technology advancement is a never-ending process; thus, we must be well-equipped and informed about new developments. Day-to-Day human life has gotten more convenient because of these technological improvements. Automation has evolved into a must need. The internet today provides access to all data and systems, and web technology is continually expanding. A network interface enables remote management and control of embedded devices using a web-based embedded system. Controlling Internet of Things (IoT) devices is done through web controllers, often known as E-controllers. A web controller, often known as an E-controller, is a set of embedded systems and software stacks that is the most extensively used method of web development in the world. Instead of employing large server systems for monitoring, administering, and handling data, remote login and monitoring using a distributed web control system produced using web pages generated in web applications are increasingly used instead of big server systems for monitoring, administering, and processing data.

2. Project Objectives

One of the main reasons for industrial accidents is the Fire due to leakage of unwanted gases and the depth of workers in industries. Leakage of any sort of gases will cause an immense problem in present times whether household, industry, restaurants, etc. a need for a monitor and fault detection is now more required than ever.

The proposed system uses an The Atmega 328 is the microcontroller that sets the commands for all other devices connected to it. Atmega 328 takes input from DHT (Smoke, humidity, and temperature sensor), Air quality sensor and gives output on the screen of LCD.

3. Literature Review

Safety is the utmost priority of all industrial sectors as even minimal malfunctions in the mechanisms can lead to unavoidable deteriorating circumstances. Human monitoring system although with good efficiency has its drawbacks as turbulences in the accuracy rate in checking and monitoring mechanisms are inevitable. Total prevention of accidents in industrial workspaces is impossible but preventive measures to near perfection in our motive are achievable.

A specified system with diverse technical devices such as sensor-based network integrated monitoring devices lowers the random and human errors produced in the validation process. Common factors such as gas leakage, fire explosion, and unauthorized entry that lead to inconveniences can be detected with optimum precision levels to avoid these disastrous scenarios.

4. Design Methodology

The Industrial Monitoring System project is built on the Internet of Things (IoT). Arduino is used to control various sensors (using smoke and temperature sensors) providing complete control over the industry. The Internet of Things (IoT) is used in this project to deliver data to the user. The Internet of Things (IoT) is a network of 'things' that allows physical items to communicate data by using sensors,

electronics, software, and networking. These systems are self-contained and do not need to interact with humans.

The system feeds signals from several sensors, such as the smoke, temperature, and humidity sensors, to the AtMega 328 microcontroller. The data is subsequently sent to the IoT module via the microcontroller (ESP8266). The ESP8266 is a chip that allows microcontrollers to connect to a Wi-Fi network, establish TCP/IP connections, and deliver data. In case a fire takes place, the smoke sensor and the temperature sensor would detect the presence of smoke and temperature changes and send the information to the AtMega 328 .

The information then is transmitted through ESP8266 to the Blynk app. Blynk app is a free app on the play store where you can connect your IoT module to your phone screen, and helps you control the project and its activities virtually. The IoT module, four LEDs, one fan, and an LCD are all connected to the microcontroller. LEDs represent different pieces of machinery that can be as a symbol.

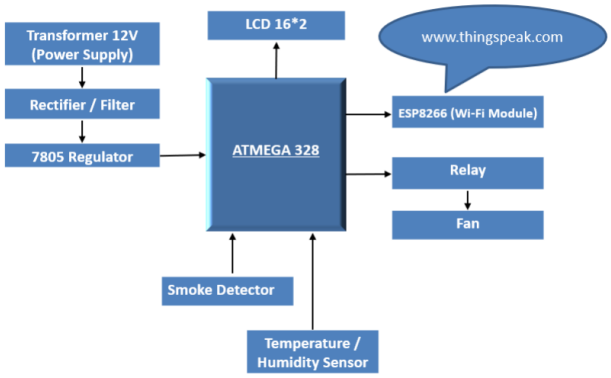

Figure 1.Block Diagram of IoT based monitoring System.

Input	*Output*
Temperature And Humidity Sensor	Buzzer
Gas Sensor	Exhauster Fan
Flame Sensor	Water Sprayer
Pir Sensor	Lcd Display

5. SENSORS

Sensors are used to improve the monitoring system by analyzing the various industrial parameters and then sending the necessary information to the Wi-Fi module which in turn sends the data to the portal. This information will be vital to know the current situation of the system and the various threshold requirements of the industrial environment. The handpicked sensor used by us in this project are listed below.

Sensors	*Specifications*
Temperature And Humidity Sensor	DHT22
Flame Sensor	LM2903
Gas Sensor	MQ-6
Wifi -Module	ESPZ8266
Micro-controller	ATmega 328
LCD Display	

5.2 SENSORS INTERFACING MICROCONTROLLER

A sensor is a device that detects changes in the environment and converts stimuli into analog signal, such as heat, light, sound, and motion. A sensor is a device that converts a physical occurrence into an analog signal that can be measured. Our microcontroller analog-to-digital converter (ADC) convert analog signal into a digital signal that can be used for further processing. These signals pass through an interface, which converts them to a binary code and sends it to a microcontroller (computer) for processing. The data is then converted into a human-readable display or transmitted for reading or processed further. Sensors are input devices that continuously record data around the environment. Our microcontroller continuously processes the data received from the sensors.

6. ADVANTAGES & DISADVANTAGES

6.2 ADVANTAGES

- The probability of human error is greatly reduced.
- This system provides time and financial savings for the business.
- Constant monitoring also allows for consistent and dependable data from anywhere around the world.
- Major accidents can be prevented without any huge damages.

6.3 DISADVANTAGES

- The need for the internet to communicate with the device is necessary and any discrepancy in the network connection may cause delay.
- The complete range of the sensors is limited and so there is a need for multiple systems to exist for effective monitoring of the whole factory.

7. APPLICATION

- Laboratories contain many chemicals, in that many are retractable to high temperatures or heat. So, every lab must contain this detecting of smoke so that vigorous reaction of chemicals with fire can be avoided.
- Refrigeration plants use CFC gases which highly react able with fire, so it is necessary to have this system in the plants.
- It is also used in various other industries like beverage manufacturing, biogas industry.
- Nowadays vehicles also use this system to prevent fire accidents.

3. CONCLUSIONS

We hope to gain hands-on experience with the trending technologies of "Embedded System" and "Internet of Things" through this project. IoT-enabled industrial monitoring systems to have become increasingly popular in a variety of industries because they improve safety standards by providing real-time monitoring of critical parameters such as temperature, humidity, and smoke, as well as alerting officials and workers regularly.

The implementation is not only for safety reasons, but it also has the potential to increase industry yields. In our project, the Internet of Things (IoT) is used to collect data and communicate through the internet. We hope that our project will be beneficial enough to be implemented in industries across India, saving lives and property from accidents and risks that are often overlooked by industry personnel and users.

ACKNOWLEDGEMENT

With the ongoing industrial modernization, these days the demand for digital and automation systems to perform functions especially in the information technology and algorithmic sectors has risen exponentially and the application of IoT in their operational mechanisms paves way for development and feasible innovation.

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