SMART INDUSTRY SAFETY SYSTEM

PRAVINESH H (210701194)
SELESTIN S (210701236)

INTRODUCTION

The IoT-Based Smart Industry Safety System aims to improve safety in factories and industrial settings using IoT technology. By using smart sensors and a connected mobile app, the system allows for real-time monitoring, instant alerts, and automatic responses to dangerous situations. This solution makes workplaces safer, reduces the risk of accidents, and helps meet safety standards. It also supports predictive maintenance and better decision-making, which helps to reduce downtime and save costs. Overall, this smart safety system provides a smarter and more efficient way to manage industrial safety.

PROBLEM STATEMENT

In many factories, safety is a big concern because traditional safety systems can't always monitor and respond to dangers quickly. This can lead to serious accidents and injuries. Managing safety inefficiently also means more downtime and higher costs. To solve these problems, we need an IoT-based solution that can monitor the factory in real-time, send instant alerts, and respond automatically to hazards. This system will make workplaces safer, ensure they meet safety standards, and reduce downtime and costs.

OBJECTIVE

01 Monitor and alert about hazards in real-time to prevent accidents.

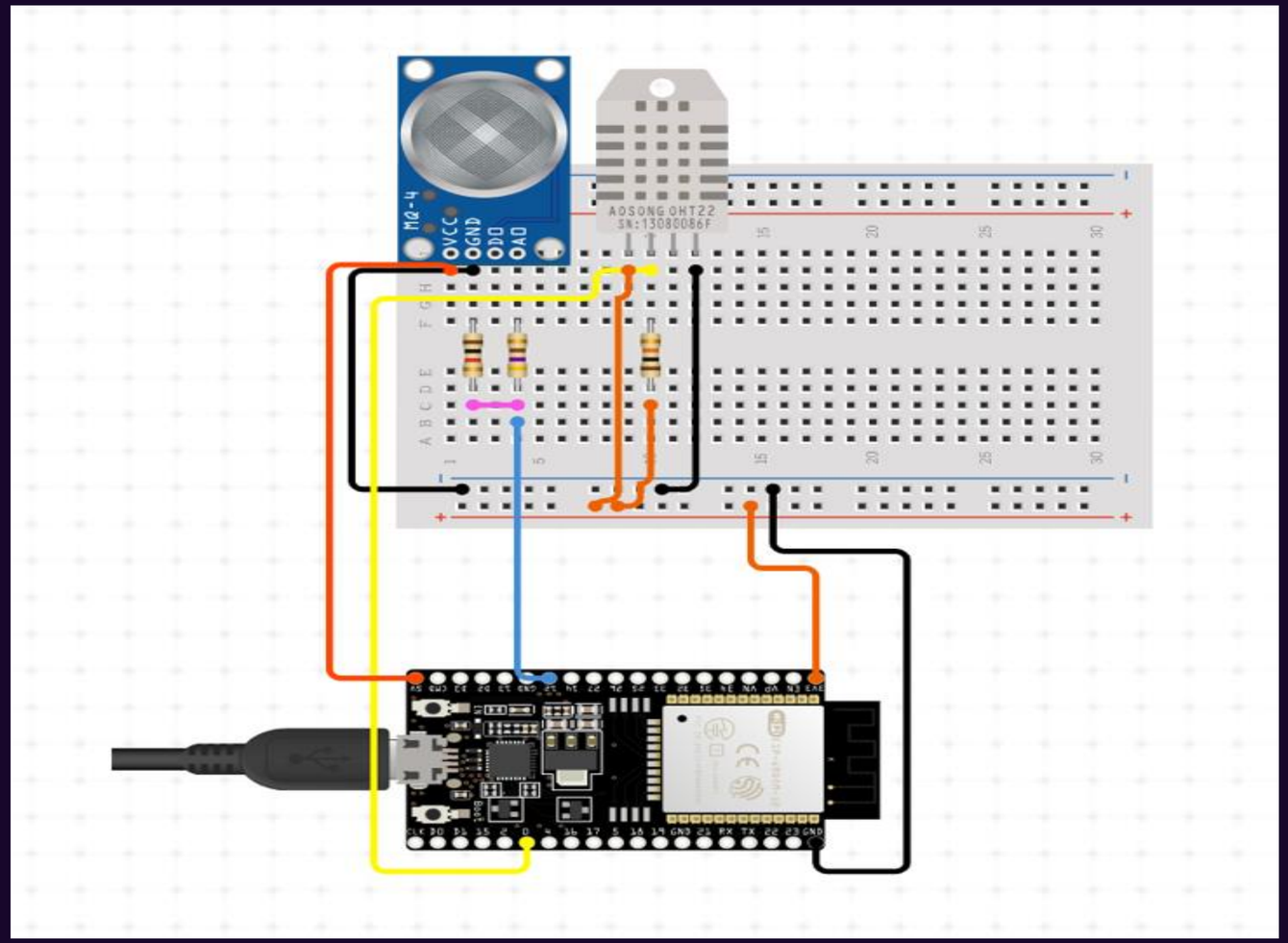
02 Automatically meet and track safety standards

03 Reduce expenses by improving safety and efficiency.

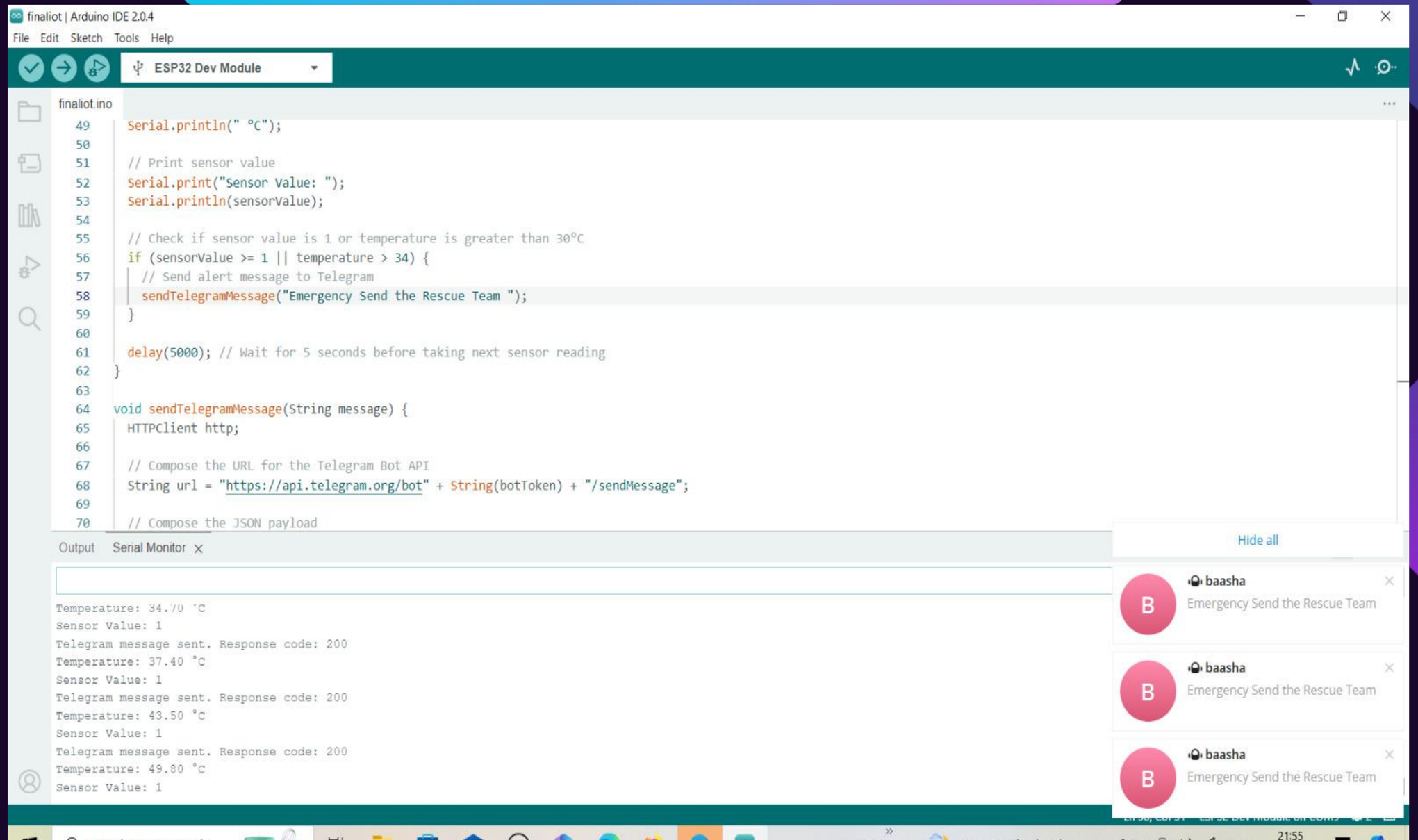
COMPONENTS USED

- Esp 32 microcontroller(Wifi module)
- MQ4 Gas sensor
- DHT11 Temperature sensor
- Jumper wires
- Breadboard

CIRCUIT DIAGRAM



OUTPUT


finaliot | Arduino IDE 2.0.4
File Edit Sketch Tools Help
ESP32 Dev Module
finaliot.ino
49 Serial.println(" °C");
50
51 // Print sensor value
52 Serial.print("Sensor Value: ");
53 Serial.println(sensorValue);
54
55 // Check if sensor value is 1 or temperature is greater than 30°C
56 if (sensorValue >= 1 || temperature > 34) {
57 // Send alert message to Telegram
58 sendTelegramMessage("Emergency Send the Rescue Team ");
59 }
60
61 delay(5000); // Wait for 5 seconds before taking next sensor reading
62 }
63
64 void sendTelegramMessage(String message) {
65 HTTPClient http;
66
67 // Compose the URL for the Telegram Bot API
68 String url = "https://api.telegram.org/bot" + String(botToken) + "/sendMessage";
69
70 // Compose the JSON payload
Output Serial Monitor
Temperature: 34.70 °C
Sensor Value: 1
Telegram message sent. Response code: 200
Temperature: 37.40 °C
Sensor Value: 1
Telegram message sent. Response code: 200
Temperature: 43.50 °C
Sensor Value: 1
Telegram message sent. Response code: 200
Temperature: 49.80 °C
Sensor Value: 1
Hide all
baasha
Emergency Send the Rescue Team
baasha
Emergency Send the Rescue Team
baasha
Emergency Send the Rescue Team

RESULT

- The system successfully detected simulated scenarios such as gas leaks, fires, extreme temperatures, and unauthorized intrusions with a high degree of accuracy and reliability. During testing, the system exhibited rapid response times upon detection of hazards, triggering alarms and activating safety protocols within milliseconds. Furthermore, the system's multi-channel alerting mechanism proved invaluable in ensuring timely communication with relevant personnel. Alerts delivered via SMS, email, and mobile app notifications enabled swift response coordination and decision-making, enhancing overall safety outcomes. The user-friendly interface provided by the web dashboard and mobile application facilitated easy monitoring and configuration of the system. Real-time data logs and analytics offered valuable insights into environmental conditions, aiding in proactive maintenance and risk management strategies

CONCLUSION

- In conclusion, the Industry Safety System represents a critical advancement in safety technology, offering comprehensive monitoring and rapid response capabilities to mitigate potential dangers in diverse environments. By leveraging a network of sensors and a sophisticated microcontroller, the system can swiftly identify hazards such as gas leaks, fires, extreme temperatures, and unauthorized intrusions. Through immediate activation of alarms and predefined safety protocols, it facilitates swift and effective responses to mitigate risks and minimize potential damage. Furthermore, the system's user-friendly interface enables seamless monitoring and configuration, while data logs and real-time analytics provide valuable insights for preventive maintenance and risk assessment. Its reliability, efficiency, and ability to provide early warnings make it an indispensable tool for safeguarding against potential hazards.

FUTURE SCOPE

- Future work for the Hazard Detection System includes integrating advanced artificial intelligence algorithms for more accurate hazard identification and predictive analytics. Enhanced sensor technologies, such as hyperspectral imaging and chemical sensing, can broaden the system's capabilities to detect a wider range of hazards. Implementing a decentralized architecture with blockchain technology could enhance data security and facilitate interoperability between different sensor networks. Additionally, exploring the use of drones and robotics for remote hazard assessment and response could further improve the system's effectiveness in challenging environments. Continued research into energy-efficient sensors and communication protocols will also be crucial for scalability and sustainability.

THANK YOU