

ABSTRACT

Despite detailed regulations and laws, accidents remain prevalent. According to situation awareness theory, individuals undergo three processes when navigating a dynamic environment: perceiving the environmental situation, comprehending the nature of their circumstances, and making decisions accordingly. In this project, an intelligent sensor-based notification system is developed to address safety concerns in industrial environments. The system integrates multiple sensors to monitor environmental parameters like temperature, humidity, air quality, and fire safety, as well as workers' health parameters. These sensors feed data into a processing and recognition system, which analyzes the information to identify potential hazards and risks. The system is designed with modular components, including sensor modules for environmental monitoring and wearable modules integrated into workers' safety helmets. When hazardous conditions are detected, the sensor node activates a notification and warning mechanism, alerting workers to potential dangers in real-time. This allows workers to take immediate action to mitigate risks and ensure their safety. Furthermore, a smart IoT gateway is implemented to facilitate data processing, local server connectivity, and client connections, enhancing the system's capabilities for centralized data management and communication. The primary objective of the project is to enhance industrial worker safety by providing proactive hazard detection and timely alert mechanisms.