Project Charter

Project Title

Mining Workers Safety Helmet using IOT

Project Description

The purpose of this project is to develop a mining worker safety helmet that utilizes Internet of Things (IoT) technology to enhance the safety and well-being of workers in mining environments. The smart helmet will be equipped with various sensors and connectivity features to monitor and prevent accidents, track worker location, and provide real-time data analytics for proactive safety management.

Problem Statement

The mining industry faces numerous safety challenges, including hazards such as falling objects, toxic gases, cave-ins, and equipment malfunctions. Traditional safety measures are often insufficient or reactive, leading to increased safety risks for workers. This project aims to address these concerns by leveraging IoT technology to provide proactive safety solutions and improve overall worker safety in mining operations.

Stakeholders

- Dr. C. Deisy - HOD of IT Department (Project Sponsor)
- Ms. C. V. Nisha Angeline - Incharge of IoT Lab (Project Sponsor)
- Raja Rajeswari.R - Head of the Project (Project Manager)
- Rithika.S - Project Team Representative (Project Partner Liaison)
- Ms. S. Pudumalar - Faculty Member (Assistant Professor, Tutor Incharge)
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- Harini.S - IT Manager (Provides IT Resources)
- Ms. R. Parkavi - Project Tester
- Mr. D. Nirmal Sahayaraj - Technician (Logistics of the Venue)
- Karthick.S - Project Customer (Mining Worker)

Project Team Members

1. Raja Rajeswari R (Project Manager)
2. Harini S (IT Manager)
3. Rithika S (PPL)

Project Objectives

- Develop a mining-specific safety helmet that ensures protection & assurance

- Enhance safety measures for mining workers

- Reduce the number of work-related accidents and injuries in the mining industry

- Increase compliance with relevant health and safety regulations

- Improve the overall well-being and job satisfaction of mining workers

Project Scope

The project will involve extensive research, design, and prototyping activities to develop a mining workers safety helmet. The scope includes:

- Research and selection of appropriate IoT sensors and technologies for the helmet

- Design and prototyping of the mining worker safety helmet

- Integration of sensors, connectivity features, and analytics capabilities

- Development of a user-friendly interface for monitoring and managing safety data

- Testing and validation of the helmet's functionality and effectiveness

- Documentation of design specifications, user guides, and maintenance instructions

Deliverables

- Mining worker safety helmet prototype
- User guide and maintenance instructions
- Technical documentation and specifications
- Test reports and validation results
- Project progress reports

Technical Requirements

- Integration of impact and collision detection sensors integrated with IOT technology
- Real-time monitoring of temperature, humidity, and gas levels
- Location tracking using global positioning system (GPS)
- Wireless connectivity for data transmission and remote monitoring
- IoT include the integration of sensors capable of detecting sudden changes in orientation or acceleration
- Compatibility with existing safety protocols and equipment

Resources

- Project manager
- Cross-functional project team members (designer, engineer, technicians)
- Domain experts in mining safety and IoT technology
- Budget allocation for research, prototypes, and production

Milestones

1. Project initiation and team formation - [8/1/24] (Already Completed)
2. Research and technology selection - [22/1/24] (Already Completed)
3. Helmet design and prototyping - [15/2/24]
4. Sensor integration and connectivity implementation - [1/3/24]
5. User interface development and testing - [16/3/24]
6. Final helmet prototype completion - [2/4/24]
7. Testing and validation - [17/4/24]
8. Documentation and reporting - [22/4/24]
9. Project review and handover - [29/4/24]

Success Criteria

- Reduction in mining-related accidents and injuries by a minimum of 20% within the first year of implementing the new safety helmet
- Improved response time and effectiveness in emergency situations
- Positive feedback and satisfaction from mining workers regarding the comfort and effectiveness of the safety helmet
- Successful deployment in a real mining environment

Risks

- Uncertainty regarding technological feasibility and challenges in incorporating features
- Technical challenges during sensor integration and connectivity
- Shortened battery life and inadequate power management in IOT utilities used in helmet

- Budget constraints that may limit the extent of development
- Regulatory changes that could impact the required safety standards

Budget:
   The estimated budget for this project is 5000, allocated for hardware components, software development, testing equipment, training sessions, and contingency.

Communication Plan:
   Regular project meetings, progress reports, communication channels (emails, meetings, project management software), stakeholder updates, and feedback sessions.

Project Closure:
- Final presentation and demonstration of the smart helmet.
- Handover of project deliverables and documentation.
- Evaluation and feedback from stakeholders.
- Post-project review and lessons learned documentation.

Conclusion

By developing a mining worker safety helmet leveraging IoT technology, this project aims to significantly enhance worker safety in the mining industry. Through location tracking, gas leak detection, temperature detection and fall detection system, the smart helmet will enable proactive safety management and reduce the occurrence of accidents and injuries. Successful implementation of this project will contribute to a safer working environment for mining workers and establish a new benchmark in mining safety practices.