Mining Safety Management System - Final Project Summary

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Project Overview:

Mining Safety Management System is a project which incorporates both software and hardware in order to lower the risks posed to the miners. The project incorporates an overarching alert system for the mining industry which triggers alarms based off of previously collected data which has been analyzed for potential patterns and causes which may trigger hazardous situations.In this document, we are providing both functional and non-functional requirements along with the test plan summary of the project as well.

Functional Requirements:

The functional requirements for our project were primarily focused on the interaction between the sensors, the central system, and the users. The requirements derived from the sensors describe the data flow, its format, and how it reaches our central system. The requirements derived from the central system dealt with data transfer and issuing alerts throughout the mines as well as analyzing data and predicting possible hazardous situations. Finally, the requirements derived from the users dealt with how the gear they use receives data and how the workers are able to communicate with others.

Non-Functional Requirements:

Usability Requirements: The usability requirements for our project heavily focused on creating a easy to use interface and tools for the users of our product. To achieve this, we require hardware and software which is simple to use and demands minimal technical experience.

Reliability Requirements: The reliability requirements focused on creating a fail safe system and minimizing the potential risks which could be caused by making our system as reliable as possible. The product has strict up time requirements and is always expected to fail in a safe manner.

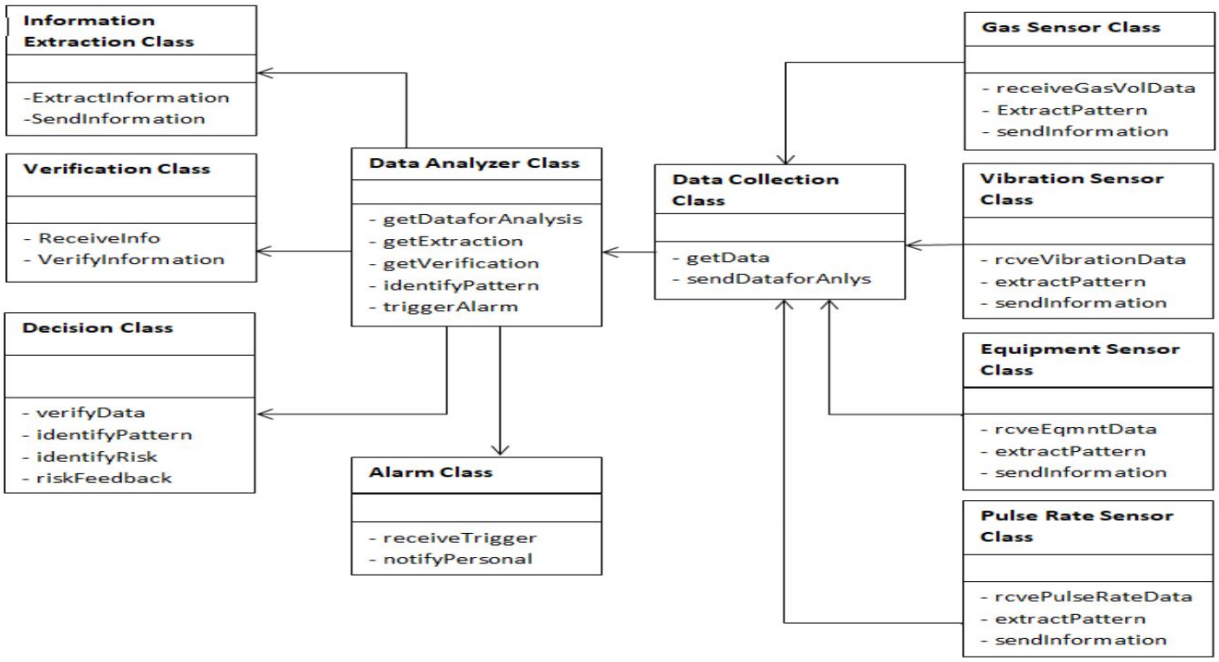
Performance Requirements: The performance requirements focused on setting specific constraints on the speed of operations and functionality through our system. This includes the speed of which data is sent from sensors to the central system to how fast information must be processed and calculated.

Supportability Requirements: The supportability requirements focused on achieving proper support for our users. The requirements involve having a well maintained support system which includes proper documentation, manuals, and a customer support team.

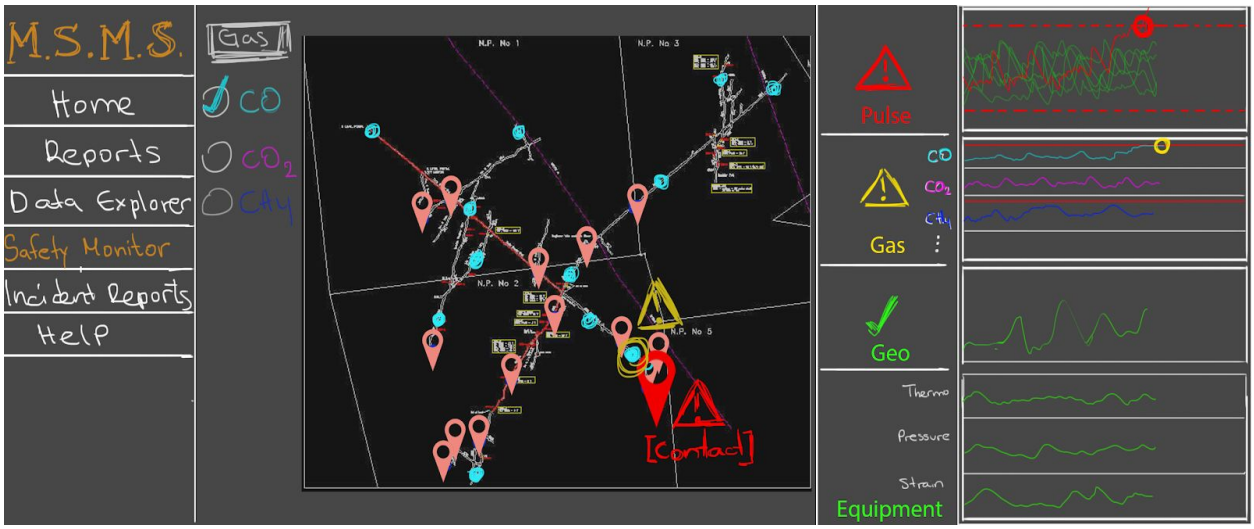
Test Plan:

For the hardware components,e will be testing all sensors, radio communication, network coverage, and alarms. This will be done by exposing the technology to a known input and determining whether the output is precise and accurate up to a defined threshold. For the software components, we will be testing our data analyzing algorithms, and our report generation tool. The tests for these two components will consist of unit, component integration, and acceptance level tests.

Class Diagram:



User Interface:



Conclusion

The project aims to improve the safety compliance of mining industries. Small scale mining industries occupy substantial portion of the overall mining industry. Safety compliance in such industries is often neglected. The project aims to build a product that would help improve the overall safety of mining industries in cost effective manner