Project Design Phase-II
Solution Requirements (Functional & Non-functional)

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Team ID	NM2023TMID15400
Project Name	Industrial Worker Health and Safety System based on the Internet of Things

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Real-time Monitoring	The system should continuously monitor various parameters related to worker health and safety, such as vital signs (heart rate, body temperature), environmental conditions (temperature, humidity, air quality), and physical activity levels.
FR-2	Ergonomic Analysis	The system should analyze worker ergonomics, such as posture or repetitive motions, and provide feedback or suggestions to improve working conditions and reduce the risk of musculoskeletal disorders.
FR-3	Training and Awareness	The system should facilitate training and awareness programs for workers by delivering relevant information and safety guidelines through IoT-enabled devices. It can provide interactive modules, videos, or quizzes to educate workers on best practices and safety protocols.
FR-4	Emergency Response	In the event of an emergency, the system should have the capability to automatically detect critical situations, such as falls, accidents, or abnormal vital signs, and trigger appropriate emergency responses. This can include notifying supervisors, activating alarms, or initiating rescue procedures.
FR-5	Mobile Accessibility	The system should have a mobile interface or application, allowing workers and supervisors to access real-time health and safety information, receive alerts, and interact with the system remotely.
FR-6	Data Analytics and Reporting	The system should collect and analyze data from various sensors and devices to identify patterns, trends, and potential risks. It should generate reports and visualizations to aid decision-making processes and enable proactive safety measures.

Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	1.Intuitive user interface: The system should have a user-friendly interface that allows easy monitoring, configuration, and reporting for both administrators and workers. 2.Training and documentation: Provide comprehensive documentation and training materials to ensure proper understanding and usage of the system. 3.Compatibility: Ensure compatibility with a wide range of wearable devices and sensors commonly used in industrial environments.
NFR-2	**Security**	1.Data privacy: Ensure that personal and sensitive data collected from workers' wearables and other devices are protected and handled securely. 2.Authentication and access control: Implement strong authentication mechanisms to ensure only authorized personnel can access the system and its data. 3.Data integrity: Employ measures to prevent unauthorized tampering or modification of data during transmission and storage. 4.Secure communication: Encrypt data transmitted between devices, sensors, and the central monitoring system to prevent unauthorized interception or manipulation.
NFR-3	**Reliability**	1.Availability: The system should be available and accessible to ensure continuous monitoring of workers' health and safety. 2.Fault tolerance: The system should be resilient to failures, ensuring that critical functionalities

		are not compromised in case of sensor or network failures. 3.Redundancy: Implement backup systems or failover mechanisms to ensure continuous operation in the event of hardware or software failures.
NFR-4	**Performance**	1.Responsiveness: The system should provide real-time monitoring and response to ensure worker safety. 2.Low latency: Minimal delay in transmitting and processing data to enable timely actions and alerts. 3.Throughput: The system should handle a high volume of data from multiple sensors and devices simultaneously.
NFR-5	**Availability**	. The system should strive to achieve maximum uptime and minimize any downtime that may disrupt the monitoring and response capabilities. This is particularly important for ensuring continuous worker safety. .
NFR-6	**Scalability**	1.Horizontal scalability: The system should be able to handle an increasing number of devices and sensors by adding more resources or nodes to the network. 2.Vertical scalability: The system should be able to handle increased data processing and storage requirements by upgrading the hardware or software components.