Smart Safety Helmet Presentation Script 1

1. Introduction

Good morning, we are presenting our project, the **Smart Safety Helmet**.
In industries and construction sites, workers face risks from accidents, gas leaks, high temperature, or even health issues. Our motivation was to build a solution that can **monitor the worker's safety in real time and send alerts**.
The aim of our project is to reduce workplace hazards by integrating sensors into a helmet that continuously tracks vital signs and environmental conditions, and provides immediate feedback and alerts.

2. Components

Our helmet uses an **ESP32** as the controller.

IR sensor – detects if the helmet is worn.

Pulse sensor – monitors heart rate.

DHT22 – measures temperature and humidity.

MQ135 – detects harmful gases.

GPS module – tracks the worker's location.

LCD display – shows real-time data.

Red and Green LEDs with buzzer – indicate danger or safe conditions.

3. System Architecture

All the sensors are connected to the ESP32.

Data is displayed live on the LCD.

If a dangerous condition is detected, the red LED and buzzer are activated.

Safe conditions show a green LED.

The ESP32 also sends the collected data to a **database** for storage and monitoring.

The GPS location helps supervisors know where the worker is in case of emergency.

4. Arduino/ESP32 Code

Our code reads values from each sensor, processes them, and checks against safety limits.
For example: if gas levels are high, if the temperature is extreme, or if the worker's heart rate is abnormal, the system immediately triggers alerts.
The code also handles sending data to the **database** for further use.

5. Database

We store all sensor data in a **database**. This allows us to keep records of the worker's health and environment, along with their location.
It can be useful for **safety analysis**, **incident tracking**, and for supervisors to quickly respond during emergencies.

Closing

In conclusion, our Smart Safety Helmet is designed to provide **real-time safety monitoring, immediate alerts, and remote tracking**, helping to protect workers and reduce accidents.