**Iot Based Smart Helmet For Construction Workers**

**AIM:**

Safety is a major problem in construction works.  This project aims to develop smart wearable devices such as band and helmet using various sensors that will help in monitoring the health and safety of workers.

**Introduction:**

The number of fatal deaths happening in the construction sites is soaring up every year. The safety and health of people is not ensured in construction sites. The workers face a lot of struggles and difficulties in the workplace due to the improper balance between work and their safety. Besides affecting them physically, they are affected mentally as well. Among all the other industries the building industry stands as the leading contributor of fatalities. According to the recent report from the Bureau of Labour Statistics (BLS), there happen around 150000 construction injuries every year and a major proportion of it is contributed by falls or slips from heights. Even with the tremendous development in technology there are no proper devices developed for the safety of worker. Hence, this paper works to build wearable devices such as smart band for monitoring the construction workers and to provide them a safer and secure working environment. The devices help in keeping track of the pulse, and body temperature of the worker. Moreover, care is also taken to provide emergency alert during any slip or fall of the worker (Both in-house and out-house fall). The rest of the paper provides a detailed study about the proposed system.

**Abstract:**

Safety is a major problem in construction works. There is no proper solution to solve the problem. People's safety is not ensured in the construction works. In most of the cases, the problem occurs due to work stress or poor health conditions. Some of the accidents occur where people fall down from heights and left unnoticed which leads to death due to lack of medical attention. According to the international report almost 48000 workers die every year due to workplace accidents and the construction site tops the list with 24.20 percent. However, most deaths occurred were preventable. This project aims to develop smart wearable devices such as band using various sensors that will help in monitoring the health and safety of workers. The devices constructed using IoT help in detecting the fall of any workers and sends SMS

notification for immediate aid. Moreover, the workers vitals such as heart rate and temperature are also monitored and warned regarding abnormal health conditions. The project aims to provide a secure and safer working environment for worker thus reducing the number of deaths happening in construction sites. The prototype developed was tested on various conditions and showed high accuracy in the performance. The system also used accelerometer sensor and GPS to monitor position of workers and location also.

**Existing system:**

In the existing system is implemented to ensure the complete safety of the workers at the construction site using by smart helmet. Through this smart helmet, the contractor can continuously monitor the entire workers health condition and can also get notification about the workers’ physical condition and can immediately save the workers from any serious issues in case of emergency.

**Proposed system:**

In the proposed system is location based health safety system for contraction workers. The overall device setup is connected with wearable belt. This smart belt is continuously monitoring the health issue and location of workers. Accelerometer sensor is used to monitor the workers standing position, if any workers got dizzy condition accelerometer sensor will send notification to contractors. Spo2 sensor is used monitor pulse and oxygen level.

**Block diagram:**

Power supply

ESP

NANO

Spo2 sensor

System

(Monitoring)

Location tracker

Speaker

ADX

**Block Diagram Description:**

Above the block diagram is contain spo2 sensor, location tracker, speaker, Arduino nano, esp8266 and ESP8266. Spo2 is connected to Arduino nano by using I2C protocol. Location tracker is connected to ESP 8266 by using UART protocol. Speaker connected to GPIO pin of ESP8266.

**Requirements:**

**Hardware Requirements:**

* **Arduino nano**
* **ESP8266**
* **Spo2**
* **Speaker**
* **Location tracker(GPS)**
* **ADX**

**Software Requirements:**

* **Compiler : Arduino IDE**
* **Language : C, C++**