– Connected Helmet –

A system notifying of a situation dangerous for workers obliged to use safety helmets.

Definition of the problem

Number of accidents in mining and processing industry, as well as construction industry constitutes over 30% of all accidents occurring overall. Unfortunately, the situation is not going to change soon. Hazards and natural forces that the industry employees struggle with on daily bases, force us to keep searching for solutions allowing to increase health and safety related to fulfilling their duties. Inventions of cutting-edge technology help to secure the lowest possible level of threat to human life. Apart from its influence on the quality and work efficiency, digital transformation, we have been dealing with in recent years in many enterprises, may also directly influence the employees' safety. Introduction of new, more efficient methods of distributing information and automatic crisis management systems contributes into improvement of work organisation.

In the picture 1, the most common causes of accidents at work in 2015 are presented. [1]
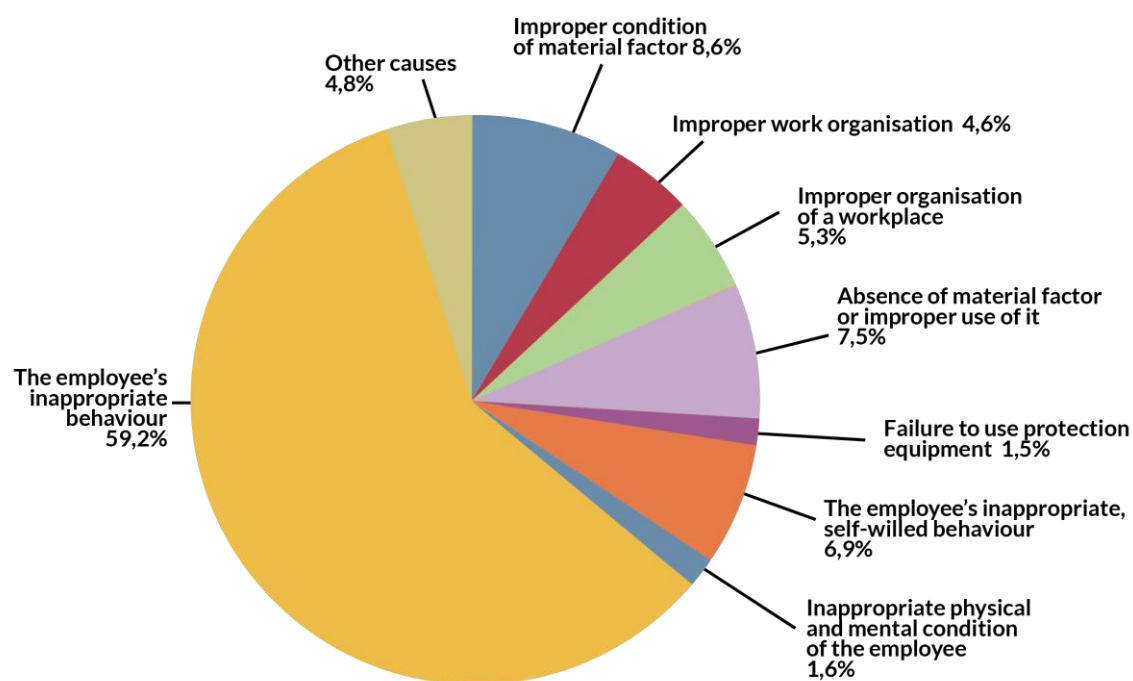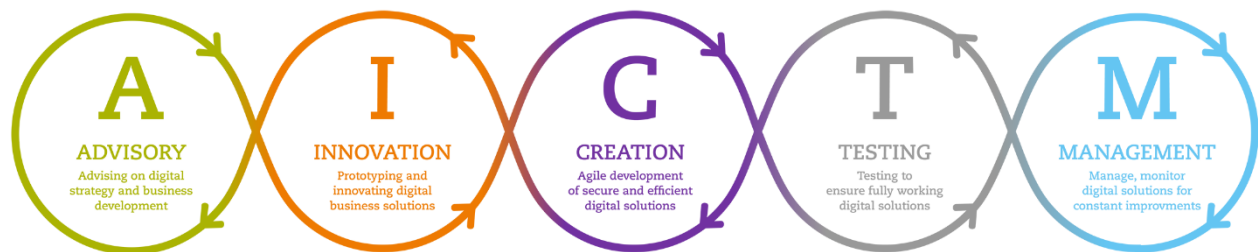

Picture 1 – Causes of accidents at work – GUS ACCIDENTS AT WORK IN 2015

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[1] GUS – ACCIDENTS AT WORK IN 2015.

Connected Helmet designed by Cybercom increases safety of every workplace where the use of safety helmets is required. The purpose of real-time, wireless monitoring with alarming and set of many sensors (including shock and localisation sensors) is to prevent multiple accidents.

Cybercom Group

Cybercom is an innovative consulting company conducting its activity in the field of IT and enabling its customers and partners to benefit from Internet of Things technology, as well as to increase its competitiveness and create Society of Intelligent Era. Cybercom is a group of approx. 1,200 people around the world, including over 200 engineers employed in Poland in three R&D facilities in Lodz, Warsaw and Bydgoszcz.

A
ADVISORY
Advising on digital strategy and business development

I
INNOVATION
Prototyping and innovating digital business solutions

C
CREATION
Agile development of secure and efficient digital solutions

T
TESTING
Testing to ensure fully working digital solutions

M
MANAGEMENT
Manage, monitor digital solutions for constant improvments

Connected Helmet Solution

Cybercom prepared the system meant for modern organisation of work, connected through wireless network with safety helmet, in order to increase the quality and safety of work. The helmet connected to the network provides the variety of functions supporting human resources management processes. Among other things, the possibility to verify if an employee is in appropriate place and has proper qualifications to do a certain job or monitoring if a person working in a given area uses the helmet properly, has valid permissions and, e.g. if he/she has undergone an adequate training to operate machines and tools. The device also reacts when the person approaches a dangerous area or situation that can potentially be dangerous for his/her health. In addition, the system allows to verify if the endangered area was evacuated, as well as to depict localisations of employees in a given area.

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Human health and safety are our key challenges, when we consider possible applications of IoT technology in industrial sector. Connected Helmet is a solution that integrates workforce management platform with sensors that are carried by employees in order to collect data and present real-time statistics.

The System's Architecture
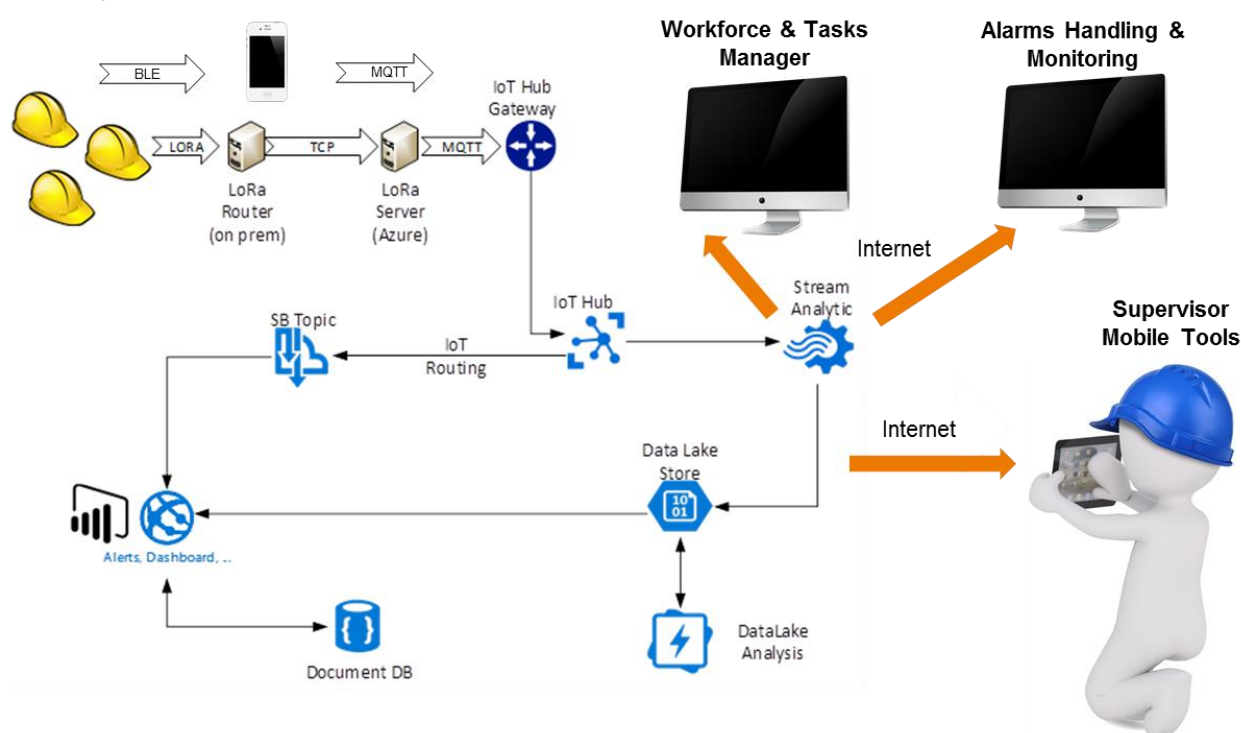
Picture 2 – The system's architecture

The communication is based on the use of wireless LoRa technology. As an alternative for LoRa system, Bluetooth technology can be used to forward notifications. Connected Helmet works constantly during a few days after charging. Therefore, it is possible to constantly receive reports from devices worn by employees, monitor and alarm in real time and save measurements in the device's memory. In short, access to information about conducted works is much better. Due to tracking based on GPS and internal localisation, persons supervising conducted works can verify where their employees are. This option can be used as a time tracking support system as well.