

Developed a 'Smart Hard Hat' for a Leading Original Equipment Manufacturer (OEM)



Challenges

A leading OEM wanted to elevate its safety management and monitoring systems proactively by developing a wearable that can constantly monitor environmental, biometric, location and contextual information around the worker.

Solution




The smart hat needed to have multiple features including the ability to constantly monitor the environment, capability to communicate real time via wireless networking, ability to “intervene” real time using audio, visual and haptic means when unsafe conditions are detected. Eventually, help the worker make an informed decision by analyzing the trends from the real time data. All these requirements made this project an extremely complex undertaking.

Altran played a very critical role in developing this solution by undertaking various activities:

- Complete end-to-end product design – from requirements to product demonstration
- Hardware architecture and design
- Mechanical ID design
- Embedded software architecture & design
- Application software including GUI based real-time indoor positioning system
- System integration and validation

The solution was developed on the TI Sitara 437X and Linux platform. Features included:

- On-board CPU and battery
- Embedded intelligence to issue alerts/notifications to workers based on acquired sensors data
- Notifications/Alerts from central monitoring control to the user based on data acquired and analyzed
- “Blackbox” functionality
- Offline mode: local event notification
- Non-intrusive user interface via audio, visual and haptic prompts
- SOS button

DEVICE	PLATFORM	APPLICATIONS
 <ul style="list-style-type: none">- Real-time data collection- Audio / video communication- Local intelligence- “SOS” button and “Blackbox” functionality	 <ul style="list-style-type: none">- Open platform concept- Storage and analysis of data- Analytics engine- Notifications to and from workers	 <ul style="list-style-type: none">- Safety as first application- Other applications possible on the same platform, e.g. remote support, on the job training, maintenance

Results

The developed product was capable of real-time collection and wireless transmission of the following information:

- Biometric -heart rate, temperature etc.
- Location, fall detection, light etc.
- Environmental -CO, radiation, H2S etc.
- Wireless Audio/Video communication
- Integrated Citizens Band radio, two way communication