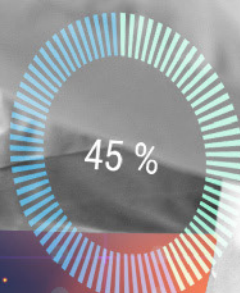
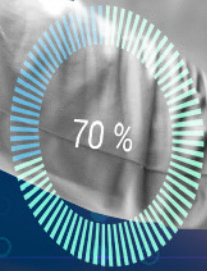


Smart Helmet: Taking safety to the next level with AI

White paper



SMART HELMET



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Introduction



There are remarkable opportunities within the smart wearable systems, or better known as smart PPE. According to global technology research and advisory company, Technavio, the market is expected to grow by US\$2.25 billion between 2020 and 2024. The report that was published in July 2020 opines that this market is expected to accelerate at a compound annual growth rate of more than 16%.

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In simpler terms, smart PPE is an equipment that connects to the Internet or any other device like Bluetooth for a specific purpose. It could be to relay a message, track movements, issue emergency alerts or even monitor body temperatures. The equipment is generally paired with a platform or solution to make full use of its goal.

Smart PPE works by capturing, analysing and tracking thousands of data points to address different purposes. It is in general a part of the larger movement for the connected workforce and the Industrial IoT to improve workplace safety and achieve operational excellence.

Zeroing into a nation like Malaysia where construction, oil and gas, telecommunications, utilities and manufacturing are a blooming industry, smart PPE became a solid, tangible solution especially in safety.

This has led the ever-evolving team at TM R&D to create the Smart Helmet, a first of its kind that targets workers in particular fields. This solution takes the common hard hat and inserts IoT solutions which result in it being a data-driven smart industrial appliance that started off as a challenge in speed and innovation.

Worker Safety



Over the years, the industrial settings as a whole have endured immense changes in terms of growth in scale, use of machinery, and diversification. Unfortunately, alongside this, the risk of accidents and mishaps have been on the rise, with occupational accidents becoming more frequent each year. Despite personal protective equipment (PPE) being helpful in many situations, it has never been enough. A confluence of factors and advancing technology today have helped reimagine safety in the workplace.

Take safety helmets, for instance -- it is one of the more frequently used PPE in a number of industries, especially among construction workers and miners underground. Considering how vital this piece of equipment is, it was rather unfortunate that their designs around the world were, and still are mostly unchanged since they were first invented and patented in 1919.



Smart Helmet Features



The Smart Helmet operates as an IoT based-solution that makes worksites safer. The solution provides live, wireless monitoring with sensors to detect elements like accident impact and geolocation to perform real-time analysis of data.

That is not all it does. Other features include GPS location tracking services, impact or accident detection, attendance detection, violation detection and a video camera for remote coaching and emergency observation of the workforce.

To top it off, the usage of the Smart Helmet allows for the collection of telemetry data from the sensors on the helmet, which can then be shared with the cloud and processed for real-time viewing.

Supervisors or personnel are given a web-based dashboard that allows for supervision of attendance and incidents, as well as analysis of past incident logs and hotspots. If workers do not wear the Smart Helmet on site, the supervisor is able to detect this and can remotely call them.

Video calls for training purposes and assessing immediate emergency situations are also benefits of the Smart Helmet.

The good news is, its access is not limited to only the dashboard but instead TM R&D came up with a mobile app as well. This app permits personnel on the ground to interface with the helmet, know their team member's status, receive alerts when incidents happen, and have a panic button for emergencies.

In addition, for privacy purposes, personnel are also given the option to be tracked via a small camera that is located at the front of the helmet. This tracking feature can be used for on-site or off-site collaboration. The Smart Helmet is also enabled via remote communication as it supports WiFi, LTE and Bluetooth connectivity. A variety of connection options were made available because some companies like oil and gas do not have an LTE connection at their refinery.

Towards a Safer Workforce with IoT



This advanced solution by TM R&D has clearly taken safety helmets to the next level. It has not only introduced concepts of IoT into the helmet but taken advantage of data and analytics to deliver new insights.

How does this solution create a holistically safer workforce? The array of sensors on the Smart Helmet provides real-time data about each worker wearing it and uploads it to the cloud. Analytics algorithms then crunch the data to offer meaningful and actionable information to supervisors, workers and the team on the ground.

The onboarding process is fairly simple. A worker only needs to pair the QR code on the helmet with the mobile app scanner. If a worker needs to transfer or loan the Smart Helmet, don't fret, the worker will only need to rescan the QR code. The solution was evidently designed to be simple and seamless to use.

After all, the purpose of technology has always been to improve how we work and live. IoT in particular has ushered in a new era of business automation across the globe and embraced every part of people's lives.



This has been further exemplified by McKinsey's report that stated "58% of companies who embraced an IoT-enabled workplace experienced at least a 5% increase in revenue, while 46% had witnessed a 5% decrease in excess costs."

Having said that, it is more true today than ever that the nature of work has changed beyond recognition as the revolution of it all steadily progresses. To have an edge over competitors and stand out, IoT solutions like the Smart Helmet should be encouraged in organisations today.



Conclusion

Smart PPE like the Smart Helmet has plenty of potential to further drive industries into being safer, more efficient and conducive for the environment they are in. As the market for this continues to grow, organisations and businesses should jump on this bandwagon simply because of all the benefits it has.

Technology will continue to evolve, and developments in this market will be promising. The adoption of solutions like this can also drive competition among industries and sooner or later, organisations of all sizes will be able to fully benefit from it.



Figure: Smart Helmet Features

Creator of Smarter Ecosystems for a better Malaysia

Established in 2000, TM R&D is the innovation arm for TM Group focusing on creating smarter ecosystems to make business and life easier for a better Malaysia. TM R&D's solutions are clustered around four (4) pillars namely Intelligent Platforms, Data Brokerage, Connectivity/Tools and IR4.0/Digital Solutions.

Growing from strength to strength since 2016, TM R&D has won multiple global awards and generated more than 2,800 Intellectual Property Rights (IPRs) and 1,400 digital assets to-date.

TM R&D's innovations are all developed in-house and cut across multiple verticals such as Utilities, Retail, Agriculture, Healthcare and Education with safety and productivity as the top priority.

As TM R&D continues to expand beyond connectivity and into smarter digital ecosystems, its role in TM has become more prominent and exciting.

We are looking for remarkable people to join us. People who are courageous enough to push boundaries, curious enough to experiment with new technologies, and who have the determination to drive new ideas forward. A new opportunity awaits you here in TM R&D.

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