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Meet TinyML: The Latest Machine Learning Tech Having An Outsize Business Impact

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As device sensors proliferate across every company's value chain – from new product development through inspection, tracking, and delivery – tinyML is surfacing to provide actionable insights, transforming business as we know it. There are sound economic reasons for all this interest and activity. McKinsey researchers predict IoT will have a potential economic impact of US $4-11 trillion by 2025, identifying manufacturing as the largest vertical (US $1.2-3.7 trillion).

The rise of tinyML to collect data from edge devices at worksites anywhere was inevitable given the explosion of sensors in pretty much every industry across global supply chains. GETTY

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The tinyML community was established in 2019. tinyML consists of machine learning architectures, techniques, tools, and approaches capable of performing on-device analytics for a variety of sensing modalities (vision, audio, motion, chemical, and others) at low power targeting predominately battery-operated devices. One of the tinyML founders, Evgeni Gousev, believes that

"..we are in the midst of the digital transformation revolution, tinyML offers ultimate benefits of extreme energy savings of performing on-device machine intelligence and analytics at low cost combined with inherent privacy features…".

Companies are already using tinyML to improve safety, reduce environmental impacts, and increase operational efficiency. For example, keeping resources safe is one of the major responsibilities of employers across industries such as mining, utilities, and manufacturing. Here's how three SAP partners are using tinyML to power safety, efficiency, and sustainability.

Data improves worksite safety

An EHS incident could significantly impact or permanently stop operations, catastrophically effecting a business. According to a report from the CDC, the median cost of a single fatality is $1.42 million USD, with a total societal cost of $554.16 million. Tagvance developed a tinyML solution that monitors employees at worksites by using ultra-low-powered devices to track their movements. The solution includes a low-powered camera that captures images of harnesses being clipped in, tracking employee on-the-job behaviors for organization compliance to safety procedures.

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Boost operational efficiency

Just about every business aims to reduce the business expense of operating fixed assets and equipment. One strategy is to increase operational

efficiencies. Perfekt launched Asset Information Management and Analytics (AIMA), which uses tinyML within edge devices to collect sensor data that provides real-time monitoring and accurate predictions for the health of mobile and fixed assets. health. To date, some organizations using AIMA have reduced incidents by 20%, and collisions by 30%, saving approximately $150M AUD in asset outages.

Improve traceability and sustainability

Companies are also using tinyML to help meet sustainability commitments. tinyML can complement sustainability solutions by tracking materials production through the supply chain. Bourne Digital is exploring how the mining industry can use tinyML to monitor the environmental impacts of mine explosives. tinyML devices integrated with camera and microphone can be deployed at mining sites to identify when a given concentration of dust or asset noise exceed safety conditions. When the device identifies an excess of dust or sound, an incident would be recorded in the SAP Environment, Health, and Safety Management solution for analysis and rectification.

tinyML is huge business leap forward

tinyML is the next logical step in every organization's journey to become an intelligent enterprise with digitalisation that connects data to actions company-wide. For leading-edge companies, as well as forward-looking IT and business stakeholders, there's plenty to like. Hardware partners such as Dell are supporting tinyML with specialised hardware that hosts and integrates intelligent data at the edge. This not only helps deliver an intelligent insights platform, but also opens organizational doors to modern architectures, while supporting industry standards including 5G and Wi-Fi 6. For decision-makers drowning in vast data lakes, tinyML is a lifesaver, federating intelligence at the edge so people can make the right information actionable faster. What's more, tinyML can improve privacy by processing

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data on the device and transmitting only what's critical. Looking ahead, Gousev was incredibly optimistic, predicting that

"we [will] see a new world with trillions of intelligent devices enabled by tinyML technologies that sense, analyse and autonomously act together to create a healthier and more sustainable environment for all".

Learn more about tinyML through LinkedIn, YouTube and at the online tinyML Asia summit.

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