CASE STUDY

Industrial IOT: Real-Time Condition Monitoring via Microsoft Azure for a Leading Australian Transport and Energy Company

About Client

The client is a leading Australian transport and energy business, entrusted with ensuring uninterrupted rail transportation operations and safety for over 7,000 rail passengers daily. Given the increasing reliance on rail transport in the region, it was critical that our client acquire real-time data and insights to proactively identify conditions that could potentially result in disruption to rail passenger travel and take the necessary actions to ensure that rail service could be provided without disruption.

Executive Summary

Techwave designed an Intelligent Condition Monitoring Platform to provide real-time information to increase performance, minimize unplanned downtime, and improve reliability for the commuter of a rail service. Furthermore, our Intelligent data-driven design has enabled efficient handling of expansive rail transit network, resulting in over 50% productivity enhancement for frontline engineers and operators.

techwave

Established in 2004, is a global end-to-end IT services & solutions company, which develops long-term relationship with clients by leveraging unique delivery models and expert frameworks.

Vertical:
Transport and Energy

Annual Revenue:
US $2.3 Billion

Region: ANZ

Key Challenges:
Lack of continuous monitoring, application integration, and smart insights

Business Challenges

Inefficient operations due to manual and ineffective monitoring of Rolling Stock, Primary Maintenance Facility Equipment, and Simulators' Condition

Lack of real-time and historical data of train status, condition, and maintenance information that could result in unplanned downtime.

Difficulties in accessing data for failure investigations, and root-cause analysis that could be improve maintenance planning and scheduling without impacting rail operations.

Challenges in integrating with other AIS and SAP Systems resulting in inefficient and higher cost operations.

Techwave's Strategy and Solutions

Leveraging our customer-centric design thinking approach, we focused on engineering an intelligent industrial digital twin platform that provides a seamless experience in connecting data from various systems and intelligent devices that could be easily understood and acted upon via automation or end-user intervention where necessary. This new digital platform was built exclusively on Microsoft Azure, and the key components included:

Data Integration & Processing

Employed Azure IoT Hub as the central data collection point, aggregating real-time data from various sources like UFWL, Weight Bridge, and TWP. Allowed client to utilize native Azure Platforms and services that could easily integrate with Azure Data Factory to facilitate efficient and secured data processing and transformation. Integrated Proactive Work Order Maintenance leveraging SAP that triggers the creation of work orders in the Plant Maintenance (PM) module from the CMS (Condition Monitoring System) platform for follow-up actions, ensuring swift and proactive response to equipment conditions.

Intelligent Monitoring & Reporting

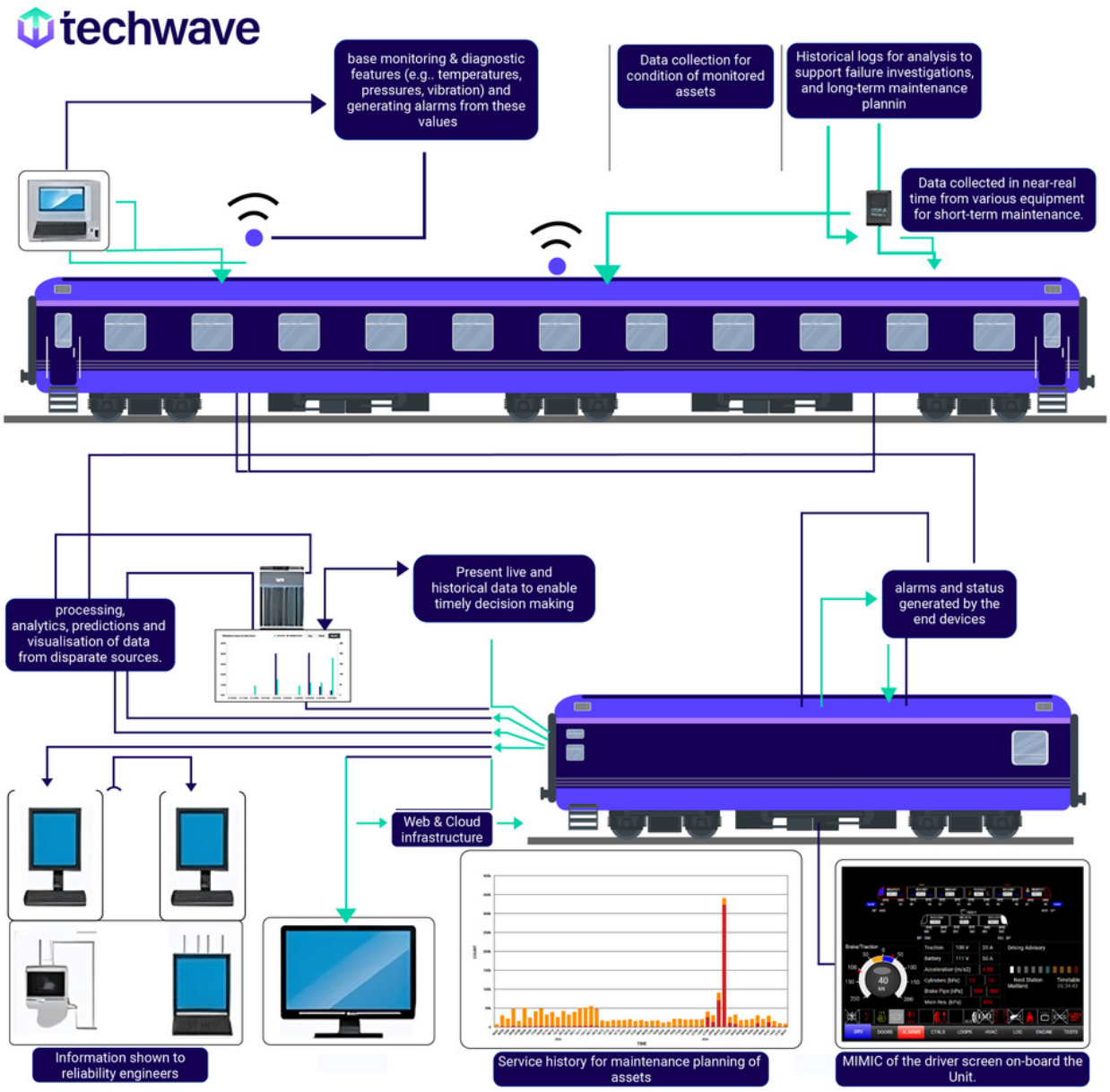
The client needed to perform large-scale data analytics. Therefore, we implemented Azure Data Explorer and Power BI for advanced data analytics and interactive visual reporting to enable proactive decision-making.

Secure and Efficient Data Management

Picked Azure SQL as a primary database service to store structured data that was utilized for efficient querying and data retrieval. Azure Key Vault for enhanced security of the cloud applications by safeguarding and managing cryptographic keys.

User Access Management

Leveraging Azure Active Directory (AAD) and integrating it with existing Active Directory for synchronized identity management, ensuring secure, simplified, and streamlined user access.



These solutions were designed not only to address the immediate challenges faced by the client but also to ensure scalability and adaptability for future needs and expansions.

Business Outcomes

Intelligent Condition Monitoring Platform that measures

1500 Parameters/hour

to proactively detect anomalies and errors that could disrupt the rail transit operations

75%

Improvement in data precision and reliability

50%

increase in productivity for frontline engineers and operators

Achieved near-instant tracking in adherence to Service Level Agreements (SLAs), ensuring timely service delivery

Reduced unplanned downtime and extended asset life through timely interventions with SAP integrations that trigger work orders for maintenance.

About Techwave

Headquartered in Houston, TX, Techwave provides Global Technology and Engineering Services and Solutions to more than 600+ clients across 5 continents. Our expertise in Data & Analytics, Software Engineering, AI/ML, Cloud Engineering Services, and Strategic Sourcing provides the end-to-end digital capabilities that empower our clients to maximize the value realization from their digital investments. Our CMMI Level 5 and ISO 9001:2015 certifications demonstrate our ability to deliver excellence to all our clients.

techwave

13501 Katy Fwy Suite 1000,

Houston, TX 77079, USA.

Ph: +12818294831

infoNA@techwave.com