ASSET INTELLIGENCE & ANALYTICS

Downer
Relationships creating success

INTEGRATED SYSTEMS – DATA SCIENCE – OPTIMISED MAINTENANCE

RTS Digital | Powered by TrainDNA

CONVERTING DATA TO MAINTENANCE DECISIONS

The module with the 'smarts' of Downer's TrainDNA product suite is the **Asset Intelligence and Analytics Module**, designed and purpose built by Data Scientists. This module supports fleet engineers to solve the most challenging problems ranging from defect investigations, optimising maintenance regimes to predicting failures.

The Asset Intelligence and Analytics Module integrates data from multiple sources (asset records, work orders, inspection records, train telemetry, wayside equipment, operator systems, environmental sources) and transforms this into a single accessible data source. Through the process of analysing data, building predictive models and applying machine learning we are able to provide a range of outputs that optimise asset maintenance and minimise service disruption.

Unprecedented changes in our environment are changing transport demands. Digital transformation underpins an organisation's ability to respond to these changes. Developed over 15 years from Downer's deep industry experience and engineering expertise, the Asset Intelligence and Analytics Module allows you to rapidly generate value from your data by turning this into insights to optimise your maintenance practices.

BENEFITS

The benefits gained from this module include faster investigations, compliance validation to KPI regimes, increased conditional maintenance, increased predictive maintenance and optimised maintenance plans.

UNIQUE FEATURES

- Data models established to store data from multiple sources such as your Asset Management System, Operator/Wayside system, Telemetry data and Weather Bureau.
- Pre-established dashboards, reports and analytics to provide speed to value.
- Pre-established business logic and engineering change processes to move to condition-based maintenance.
- Transforms and conforms data in real-time to be stored in the data warehouse to allow processing and reporting.
- Stores data in a Data Lake in native form, to allow analytics, use in predictive models and machine learn post event for specific investigations and other unplanned use cases.

TrainDNA

WHAT IS TrainDNA?

A full suite of rail and transit system asset management services, designed to provide class leading performance and improve passenger outcomes.

ACCESSING DATA TO BOOST EFFICIENCIES

Upgrade to next generation asset management technology and provide the industry's most reliable, available and efficiently run trains.

Case Study: Electrical Auxiliary Power (EAP) Supply Failures

The cleanliness of an air filter affects the EAPS performance.

EAPS can fail if there is poor air quality. Data Science was be used to correlate data, including the weather forecast, to predict if and when a failure will occur.

THE MODULES

Flexible, scalable and agile, TrainDNA is comprised of five standalone and inter-operable modules. Reap the benefits of one module, or add and combine multiple modules at any stage of operational maturity. The data, capability and knowledge of each module is proven to shape successful business decisions and improvements.

Maintenance Management
Asset management, maintenance activities and the related workforce planning.

Operational Intelligence
Real-time data, integrated from many sources (trains, maintenance facilities, operators).

Asset Intelligence and Analytics
The process of analysing data and producing insights and findings.

Robotics and Automation
Remove manual tasks that are prone to human error, difficult to perform and time consuming to complete.

Sustainability
Optimising real-time power consumption, work practices and track sustainability benefits.

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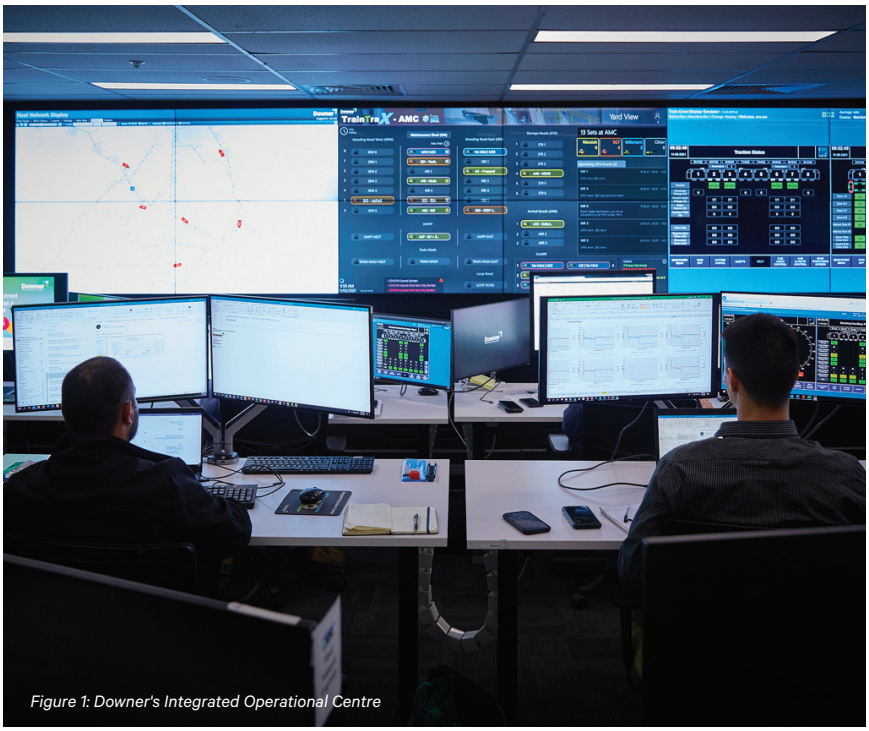
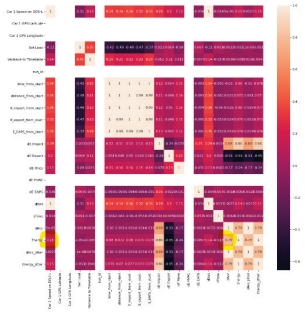


Figure 1: Downer's Integrated Operational Centre

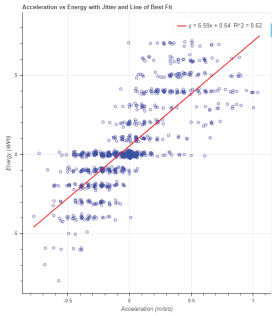
HOW IT WORKS

With over approx 100 messages every 60 secs coming of each train, the **The Asset Intelligence and Analytics Module** is a simplified approach to managing the vast amounts of data, systems and applications used in train operations and maintenance. We analyse your current state data, applications, and system integration landscape, introduce capabilities immediately and develop a roadmap for your applications, systems, and data architecture to bring on additional capabilities over time.

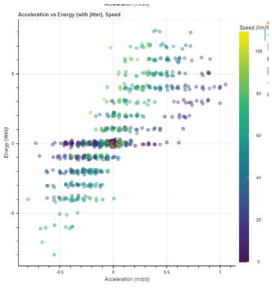
Downer recognises that every train has differences. By having a standard data model and transforming data, existing reports, analytics models, and business logic can be applied with minimal change. Where required, our experienced Data Scientists can tackle the more challenging investigations including, condition based decision models and predictive models.



Python correlation matrix for signals against energy usage.



Using ER data to plot 5 second KWh consumption vs accel for one set one run.



Same data overlaid with current speed, colour coded.

REPORTING AS A SERVICE

This service provides pre-packaged reports, analytic models and dashboards for improved maintenance management in eight areas of focus; and pre-existing dashboards for KPI measures and performance/penalty regimes.

The eight pre-packaged report focus areas are:

1. Maintenance Interval Optimisation.
2. Workforce Utilisation.
3. Reliability Analysis.
4. Energy Efficiency.
5. Failure Prediction.
6. Asset Life Expectancy.
7. Supply Chain Performance.
8. Configuration Control.

PLATFORM AS A SERVICE

A cloud-based data-platform, consumed as a service, with the capabilities to support this module including:

- Unique user interface for ad hoc reporting.
- Data warehousing.
- Data lake with raw data extraction.
- Integration platform that allows access to all data sources.

DATA SCIENCE AS A SERVICE

A resource-based service, it provides data scientists who have 15 years working to solve problems in rollingstock maintenance. Examples include:

- Extending bogie overalls from 1.2M kms to 1.6M kms by implementing CBM.
- Predicting battery failures.
- Predicting door failures.
- Track Data Analysis.
- Component failure investigation such as Traction Inverters.

In addition to ensuring best practise standards, this module also supports organisations transitioning from fixed maintenance (FM), to condition based maintenance (CBM), through to predictive maintenance (PM).

Talk to one of our TrainDNA specialists and find out more about our modular approach.

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