Asset Optimization: Leveraging Smart Assets

ASSET OPTIMIZATION

With the trending surge in capabilities of assets in the field—from oil rigs and wind tunnels to medical equipment—they've learned to communicate through the internet, transforming the internet of people into the Internet of Things (IoT). Historically they were limited to core functions, with few having the ability to perform more complex capabilities like sensing conditions, logging activity details, or transmitting and communicating findings.

Today, assets have dramatically matured to the extent that—when participating within IoT platforms—they are capable of logging and transmitting every activity, including their own condition as well as surrounding conditions. The availability of increasing amounts of sensor data provides huge opportunities to tap into real-time conditions, drive actions that improve productivity, and reduce downtime to improve asset utilization and effectiveness.

While the capability to receive signals remotely allows assets to be managed from a central control point, which reduces the overall cost to operate, the benefits also present certain vulnerabilities and risks.

Making Sense of Sensor Data

For many years, large industrial assets have had sensor data output, allowing service technicians to diagnose and service them. Increasingly, they are being fitted with communications capabilities or replaced by new assets already equipped. And as the cost of sensor and communications technology decreases, smaller assets are available with similarly equipped capabilities. These are the drivers of a massive increase in the scale and quality of available data. Sensor data from assets convey a wide range of behavioral data, including:

- Machine logs
- Sensor data (e.g., temperature, pressure, operating conditions)
- Process control data
- Web interactions
- Geo location
- Error or warning codes

Connected Assets

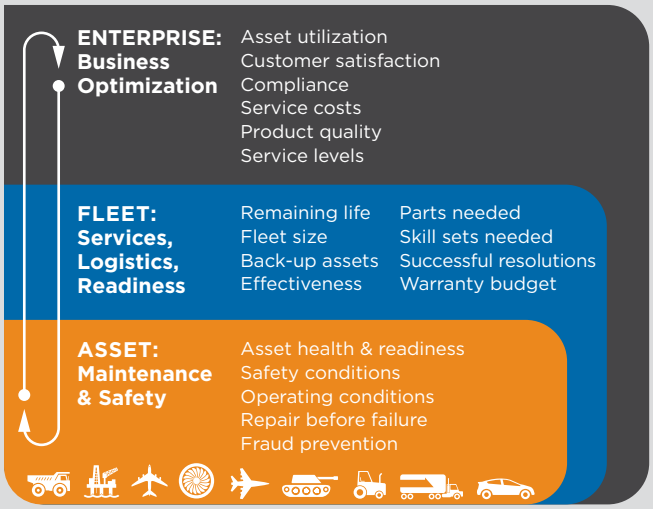

Figure 1: Leveraging connected assets to improve operational efficiency across the enterprise.

To gain a real understanding of the behavior and state of the machine/asset—or predict what might take place next—sensor data must be combined with business context data from central office systems (i.e., traditional transaction-level data, including breakdown history, repair logs, and parts used, from the ERP and other transactional systems).

To make real sense of the sensor data, organizations must employ robust data management and deep analytical techniques. Those that master the process of acquiring and integrating all their data will really progress toward being an analytics competitor[1].

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Leveraging Data for Asset Optimization

The capture of real-time data—when combined with transactional and other context data from ERPs—can deliver powerful insights into operational efficiency, enabling you to be more predictive. Tapped appropriately, data can be leveraged to drive various business benefits such as lower costs and increased customer satisfaction through predictive maintenance, faster and more successful breakdown resolutions, warranty cost management, early warnings, product quality improvements, service planning, life-time service cost projections, and asset utilization.

For example, monitoring the warranty claims or breakdowns from all assets—and evaluating for a common theme across the issue—can provide insights leading to an early warning of impending failures. A proactive step to avoid further failure could save significant downtime and related service costs.

Similarly, remote monitoring of assets to detect behavioral anomalies could drive a rescheduling of planned maintenance to avoid a breakdown. The same effort could also delay unwanted planned maintenance to reduce service costs and increase utilization.

Assets such as power grids can be monitored for real time load and voltage fluctuations to determine the possibility of breakdown. Insights into peak loads by region and time can allow for remote management to optimize asset performance.

Overcoming the Business Challenges of Data Management

One of the biggest challenges in leveraging asset data to drive business benefits is the ability to manage the data itself.

A Robust Infrastructure

A robust infrastructure is required to ingest streaming data at a very high frequency—and store the data captured. Being able to tap into massive volumes of data and passing it on to a storage environment is, in itself, a significant effort. Frequently, the forms of data streaming in from various assets are unusable—arriving with its data format corrupted, missing expected data, or with abnormal data due to the sensor behavior itself. Even before analytics can be applied, a robust infrastructure and capability is needed to validate, transform, and normalize the data.

Analytics Modeling

Once the data is available, identifying the type of analytics to model and derive meaningful prescriptive actions is key to improving business outcomes. Ongoing validation of analytics output to evaluate the suitability of model parameters is required to ensure high accuracy of predictions.

Data Security

Most importantly, data security can be a significant issue if not properly addressed. Despite the benefits of having more intelligent assets, the idea they are open for transmitting and receiving data can present security risks. The assets, as well as internal data systems, become more vulnerable to cyber-attacks to the extent where they could be hijacked by external entities. A robust security layer through right authentication along with access privileges are a crucial component of the infrastructure for asset management.

The Teradata Advantage

Teradata empowers companies to achieve high-impact business outcomes. With a portfolio of business analytics solutions, architecture consulting, and industry-leading big data and analytics technology, Teradata unleashes the potential of great companies.

For more information about Teradata and asset optimization to improve operational efficiencies, visit Teradata.com/solutions-and-industries/Asset-Optimization.

Footnotes:

1. From hbr.org/2006/01/competing-on-analytic

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