IoT for Industrial: From Machine-Learning to Actionable Insights

DATA ANALYTICS

With all the hype around the **Internet of Things (IoT)**, most companies still struggle to realize the benefits of ubiquitous data. Devices of all types are coming online and connecting in networks at break-neck speed. Data sources and supplies are seemingly endless and ripe for the picking—and potential for profit is staggering. Yet, the hard truth is that, investing in the right platforms to connect and analyze IoT data forces hard choices that will separate the market leaders from the "also-rans".

Gartner (among others) says the Internet of Things is a top strategic trend in technology, and few industries will remain untouched by the tremendous possibilities and value it creates.

Breaking down the IoT

The IoT represents the constantly growing universe of sensors and devices that create a flood of granular data about our world. The "things" include everything from environmental sensors monitoring weather, traffic or energy usage; to "smart" household appliances and telemetry from production-lines and vehicles. These sensors are constantly getting smarter, cheaper and smaller. Many are smaller than a dime, and are projected to eventually evolve into "smart dust" (thousands of tiny processors which will be sprinkled on surfaces, swallowed or poured).

The IoT offers unprecedented possibilities

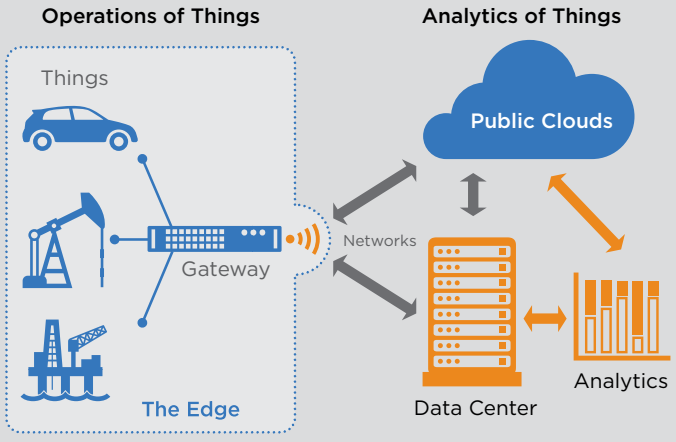
The IoT has the potential to advance nearly every aspect of businesses, from product development and manufacture to maintenance and enterprise resource planning (ERP).

- Connected car sensor technology can track vehicle performance, driver behavior, and road and environmental conditions providing new clarity around part failure or engine breakdown for auto manufacturers. Hundreds of sensors generate thousands of data points and gigabytes of data hourly. Smart onboard systems use that data to detect an imminent collision and automatically take evasive action.
- Industrial equipment manufacturers can track their construction equipment performance and not only predict a potential failure, but also diagnose the problem and have the correct repair parts and service technician available as soon as the vehicle is available for maintenance. This lowers the cost of repair, reduces turnaround time, provides consistent quality of repair, and the diagnostics analytic tools learn from each event to continuously improve diagnostic accuracy.
- It's now possible to not only monitor the progress of cargo shipping from point A to point B, but also conditions along the way that can affect end-quality (e.g. humidity and temperature for sensitive-items like pharmaceuticals and food).

Connecting the dots to data-driven revenue

As the volume, variety and complexity of sensors and other telemetry sources grows, the connections between them create an IoT value curve that's rising

Simple View of Internet of Things



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exponentially. The real value, however, depends on the analytics applied to investigate this massive pile-up of fresh and timely data.

Key priorities include intelligent "listening" to massive streams of IoT data to uncover distinctive patterns that may be signposts to valuable insights. But in order to realize the full value, advanced analytics of all data, from the machines and from the enterprise must be implemented to optimize paths to value. Every bit of data must be integrated in an analytical ecosystem with advanced machine learning algorithms, operating at scale to reap sophisticated, actionable (and oftentimes hidden) insights.

For example, significant value can be attained by performing condition-based monitoring and maintenance of jet engines using sensor data from the engines, the aircraft, and the environment. But that's only half the story: With the knowledge gained from such performance analysis, a new business model becomes possible whereby the sale of the engine as a capital item is replaced by the provision of engine thrust as a service. In doing so, performance incentives for operator and vendor are synchronized: Pay when the engine works, not for expensive repairs when it fails.

Predict success with "smart analytics"

Connection-based "smart analytics" can predict future performance and conditions, and even prescribe future actions.

- One major provider of medical diagnostic and treatment machines leverages predictive maintenance to create "wear-out models" for component parts in its products. The result is increased up-time, extended maintenance windows and longer lifetimes for costly components.
- A large European train manufacturer uses predictive analytics to prevent train engine failure. This key capability enables the firm to keep more trains operational. It's also allowed them to delve into the service market, a new and profitable line of business that depends upon trains that perform well and deliver the transportation capacity promised.
- A leading construction machinery and equipment manufacturer uses advanced analytics to boost operational efficiency of large haul trucks. Engineers put predictive failure models to work against mining truck engine data to enable higher uptime in high-cost mining operations, saving over $100M in operational costs.

The influx of new data within manufacturing organizations continues to morph and multiply. Every business must think today about how to more effectively collect, organize and analyze the growing wave of IoT data, and start working on a new way forward. Of equal importance, an intuitive analytics environment must be thoroughly self-service to enable rapid exploration of any new data set—without overburdening IT teams with costly, requirements-driven custom projects.

The Teradata Advantage

For years, Teradata has enabled sensor-fueled analytics with manufacturing companies to improve operational efficiency and equipment utilization. Organizations are empowered with the proven technology and solutions within their "Analytics of Things" to unlock the full value of their IoT investment, with rapid implementation and onsite manufacturing experts to facilitate every step of the way.

To learn more, visit teradata.com

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