

Big Analog Data of the Future: From the Edge to the Enterprise

With the proliferation of sensing and networking technologies, adding measurements to systems has never been easier and more cost-effective.

In the midst of this explosion of engineering and measurement data, if companies don't have a sound data management strategy in place, a few years from now they'll be incapable of effectively dealing with and managing all of their data. Because of this, best-in-class measurement and analytics solutions must have two fundamental capabilities: (1) edge analytics and (2) smart enterprise management and analytics.

Pushing Measurement Analytics to the Edge

Over the past decade, the intelligence of data acquisition devices and sensors has drastically increased and become more decentralized, with processing elements moving closer to the sensor. One look at the many examples of acquisition systems and nodes integrating the latest silicon and IP from companies like ARM, Intel,

and Xilinx proves as much. But in addition to measurement devices getting smarter, smart sensors have emerged that integrate the sensor, signal conditioning, embedded processing, and digital interface/bus into an extremely small package or system.

Given this trend, many scenarios now emphasize intelligence and advanced signal processing at the edge. Within asset monitoring applications, traditional measurement systems log every data point to disk, even when nothing substantial with the physical phenomena being measured is happening. This can result in gigabytes and potentially terabytes of data from thousands of deployed systems that need to be analyzed and sifted through offline.

As processing moves closer to the sensor, innovation in measurement system software is required to efficiently push analytics to the edge. Future software for edge-based systems will be able to quickly configure and manage thousands of networked measurement devices and push a myriad of analytics and signal processing to those nodes. Going forward, companies must transition to smarter, software-based measurement nodes to keep up with the amount of analog data they'll be producing.

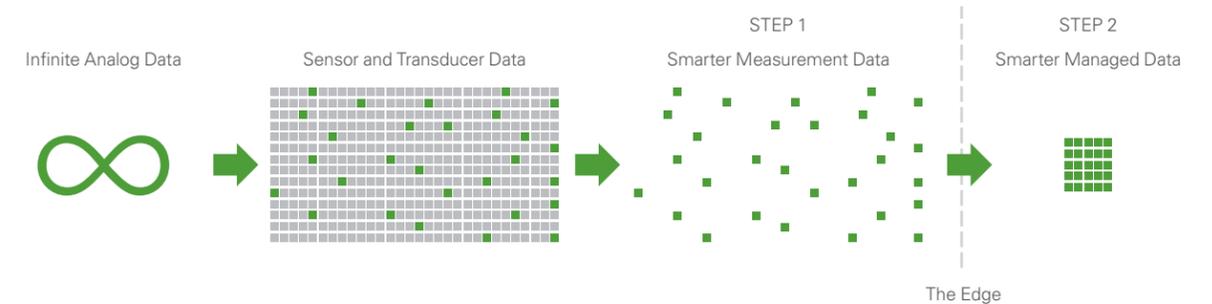
Creating Smarter Enterprise Management and Analytics

Once the data is captured from smart systems, the next step is to push that data to the enterprise to effectively manage, consolidate, and perform large-scale analysis

“Analytics at the edge in IoT and other industrial solutions play critical roles in solving the Big Analog Data problem. Intelligent measurement nodes afford analysis of data inline and, in turn, accelerate meaningful results. It's all about time to insight from the big data.”

—Dr. Tom Bradicich, General Manager and Vice President, Hyperscale Servers and IoT Systems, Hewlett Packard Enterprise

SOLVING THE BIG ANALOG DATA CHALLENGE



With smarter measurement systems, you can embed more processing at the point of the acquisition and capture only the most critical data. An enterprise data management solution helps to ensure that you are getting the most critical data in front of the right people to make data-driven decisions faster.

on the data. An enterprise data management and analysis solution that can manage engineering data from numerous sources is paramount for getting the right data in front of the right people at the right time to make the right data-driven decisions. Two key considerations are properly documented data sets and smarter analysis.

Properly Documented Data Sets

To accurately perform analysis across multiple sources, all data sets should include consistent metadata, or descriptive information that describes why the test data was saved. Metadata can include information such as the test setup, test outcome, units of the measurement, and so on. According to the IDC, most companies document 22 percent of the data they collect, but they can analyze on average only 5 percent of their data. That is a lot of potentially critical data that is simply going unused. Companies that focus on standardizing metadata, which increases the amount of data they are able to automatically analyze, will see increased competitive advantages.

But before starting an implementation to standardize metadata, engineers must first agree on which metadata is important for their analysis. Best-in-class companies often include a project specification defining the metadata nomenclature and attributes collected. Applications should attempt to document as much of the agreed upon attributes at the point of acquisition. However, many companies are also adding attributes after the data has been collected by running automated

checks and inserting attributes that are missing. This includes Jaguar Land Rover, which automated metadata quality checks and, within one year of developing and implementing an enterprise data management solution, estimates that it went from analyzing 10 percent of its data to now analyzing up to a staggering 95 percent of its data. The uniformity of its metadata allowed it to apply consistent and automated analysis mapped to defined attributes.

Smarter Analysis

According to Frost & Sullivan's September 2015 report on the Global Big Data Analytics Market for Test & Measurement, product development costs can be reduced by almost 25 percent, operating costs can be reduced by almost 20 percent, and maintenance costs can be reduced by 50 percent if big data analytics is applied for testing. Considering that analog data is the fastest growing and largest type of data that can be collected, finding new correlations and predicting future behaviors are key to maintaining a competitive edge.

To do this, companies that take measurements for research, design, and validation will need to drastically improve how they collect and analyze data on the edge and manage and analyze data within the enterprise to ensure they are leveraging it efficiently and making data-driven decisions. The sooner they do, the sooner they'll be turning better data into bigger returns.