Connected Manufacturing Powered by IoT

Introduction

The Internet of Things (IoT) comes at a time when digitization is transforming all industries. The opportunity for manufacturing is to accelerate its evolution and finally implement the vision of an automated, real-time, two-way information and control loop that will increase productivity and quality dramatically. The journey starts with getting equipment and process insights from sensors placed everywhere, not just in strategic places. The end-game is when manufacturers will be able to automatically push commands back to them, in real-time.

Given the complexity and variety and volume of manufacturing and IoT data, organizations must fundamentally rethink their data management strategy—transitioning to a platform that is optimized for the scale and complexity of the data. For example, a single industrial turbine generates 1-5TB of data every single day.

Getting a handle on these flows of information becomes cost prohibitive with the current approaches. In order to innovate, to remain competitive and differentiate, manufacturing organizations must break through and fundamentally change their approach to managing their data in order to gain the insight they need: an actionable view of their operations, products, customers, and supply chain.

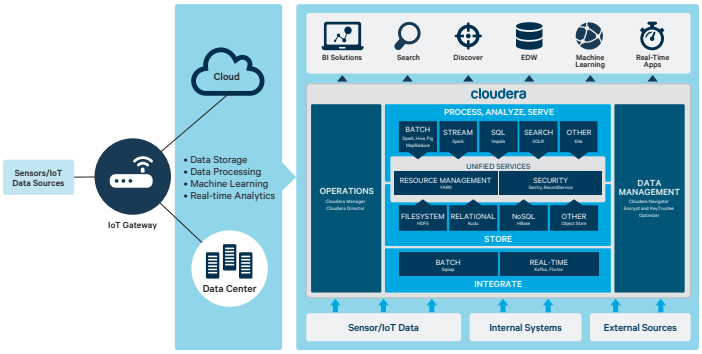
> The potential value that could be unlocked with IoT applications in factory settings could be as much as $3.7 trillion in 2025.
> –McKinsey Analysis

Generating value from IoT entails effectively managing both data at rest as well as data in motion. In fact, the success of IoT deployments will depend on the ability of organizations to gain insights out of all this fast-moving, high-volume data. The need to drive real-time insights means that each step of the data-in-motion process—ingestion, processing, and serving—is critical.

A Data Management Platform for Industrial IoT

Today, leading organizations worldwide are adopting Cloudera Enterprise—based on Apache HadoopTM—as the data management and analytics platform for storing, managing, processing, and, more importantly, driving analytics from all of their manufacturing data.

With Cloudera Enterprise, organizations can easily ingest data from multiple sources onto a single, unified, secure platform—combining and correlating IoT sensor data streams with activity logs, transaction data, customer data, external data, and much more. Any type of data (whether structured,



unstructured, or semi-structured) can be loaded into Cloudera Enterprise without altering its format—preserving data integrity and delivering complete analytic flexibility.

Industrial IoT Use Cases

Predictive Maintenance

Using real-time data to predict and prevent breakdowns can reduce downtime by 50 percent. When you unlock the power of IoT to capture and analyze data, your business can identify warning signs of potential problems, predict when equipment needs maintenance, and pre-emptively service that equipment before problems occur.

- Equipment monitoring & diagnostics
- Eliminate machine downtime
- Predictive Analytics & Alerts

Operations Optimization

With IoT, manufacturers can gain a comprehensive view of what is going on at every point in the production process and can make real-time adjustments to maintain an uninterrupted flow of finished goods and avoid defects. This gives them the ability to view how the end-to end process is running and address bottlenecks in real time. It also reduces the possibility of human error.

- Monitor production flow in real-time
- Eliminate waste and improve efficiencies
- Improve safety & energy efficiency

Supply Chain Optimization

By optimizing the supply chain manufacturers can realize savings between 20 percent and 50 percent on factory inventory costs through real-time inventory monitoring and optimization measures.

- Real-Time View of the Supply Chain
- Inventory Optimization
- Real-Time Inventory Predictions

Leading Industrial Automation Organization in North America Enables Predictive Maintenance in an Industrial Setting

The company needed the ability to monitor, store, and analyze data from thousands of diverse manufacturing systems across multiple factories, in real time, in order to do predictive analytics and drive operational efficiencies.

With customers generating almost 50 gigabytes (GB) to 1 petabyte (PB) of data per factory per month, including sensor data that measures everything from the speed, force, temperature, pressure, and revolutions per minute of factory equipment, the company was looking for a scalable data management platform that can process enormous data volumes, including both data at rest as well as data in motion.

The solution was the cloud-based Connected Factory, running on Cloudera Enterprise. Through their industrial IoT solution, based on Cloudera Enterprise and running on one of the leading cloud platforms, the company was able to leverage predictive analytics and machine learning capabilities across petabytes of IoT data to help their customers reduce production downtime and increase competitiveness.

By running Cloudera Enterprise in the cloud, data and analytics could easily be delivered as a service, enabling them to offer real-time apps, machine learning, and business intelligence (BI) solutions to help customers more efficiently manage their production resources.

The impact of the solution was significant, both in reducing costs and improving customer satisfaction.

- **Achieving real-time predictive maintenance:** By processing and analyzing time-series sensor data from production systems, the company can now effectively detect signs of mechanical wear and degradation well before they are visible to factory staff, so that they can take action before a failure occurs.
- **Driving toward zero downtime:** By combining sensor data streams from factory floors with structured data from internal and external systems, company engineers are now able to spot and fix problems before they are visible to the operator and affect production.
- **Reducing costs:** Reduced downtime helps prevent millions of dollars in lost production. Additionally, when maintenance is needed, machine learning capabilities help the company match the right technician or engineer with a problem more quickly, enabling them to scale service worldwide without investing millions in additional resources.

About Cloudera

Cloudera delivers the modern platform for machine learning and advanced analytics built on the latest open source technologies. The world's leading organizations trust Cloudera to help solve their most challenging business problems by efficiently capturing, storing, processing and analyzing vast amounts of data. Learn more at cloudera.com.

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