

# Multi Site OEE Improvement

Solution Brief



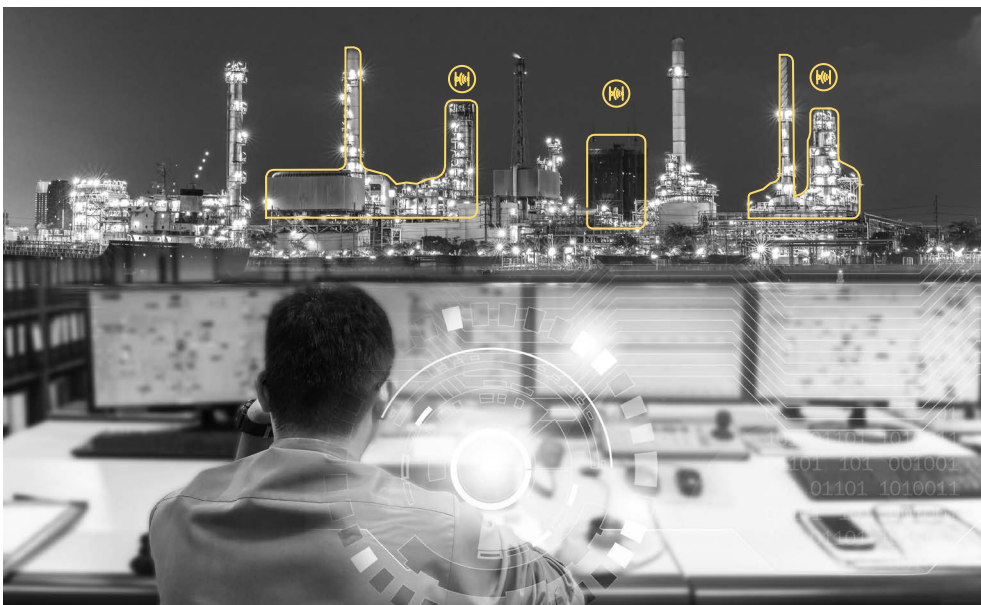
## Improve OEE across multiple sites by leveraging advanced analytics and cross-site visibility

Discrete manufacturing organizations face unique challenges in maintaining high efficiency and productivity across multiple production sites. Variations in operational practices, inconsistent data collection, and disparate systems can hinder efforts to optimize overall equipment effectiveness (OEE) consistently.

Multi-Site OEE Improvement solutions address these issues by providing a unified platform to standardize performance metrics, aggregate data from all locations, and enable real-time monitoring and benchmarking. By leveraging advanced analytics and cross-site visibility, these solutions help identify performance gaps, share best practices, and drive continuous improvement initiatives across the enterprise.

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## Current state and typical challenges

Manufacturers face significant challenges in achieving multi-site oee improvement, including inconsistent data collection methods and varying operational standards across different locations. Additionally, integrating and standardizing performance metrics across diverse systems and equipment can be complex and resource-intensive.

### Operations

- Predominantly manual, paper-based methodologies
- Inconsistent reporting of downtime and productivity
- Low real-time visibility across multi-site production assets and systems.

### Data management

- Disparate OEE data collection systems
- Inconsistent data accuracy and reliability
- Lack of centralized, real-time data collection for oee metrics across sites

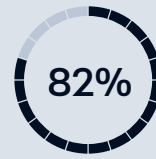
### Maintenance

- Data silos across multiple systems affecting analysis and prediction of critical issues.
- Difficulty in implementing uniform predictive maintenance programs

### Inventory management

- Variability in inventory tracking and management systems
- Challenges in maintaining optimal inventory levels without overstocking across multiple sites

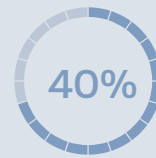
## Overall equipment effectiveness in discrete manufacturing



of manufacturers believe flexibility and the ability to dynamically shift production or product mix is critical to achieving growth goals.



of capacity losses (after schedule losses) are due to equipment not being able to produce up to capacity.



of global manufacturer DO NOT use analytics data recorded from connected devices to analyze processes and identify optimization possibilities .



of untapped overall equipment effectiveness (OEE) is the average unlocked manufacturing capacity in most plants.

Source: Accenture Research



## Addressing key priorities

In many manufacturing organizations, monitoring the overall equipment effectiveness of assets is a priority across multiple functional areas. Key leadership stakeholders may include the following:

### CEO

Growth of our core business is being jeopardized by supply chain and manufacturing disruptions.

### Manufacturing VP

How can better utilize our asset base & lower conversion costs, while relying less on capital for capacity?

### EH&S VP

How can we create a zero-incident company to protect our license to operate while reducing maintenance cost?

### Plant Manager

Everyday we review yesterday's reasons for missing production targets. Unplanned downtime is killing us.

## Overall equipment effectiveness interventions



### Real-time multi-site visibility

Real-time visibility across multiple sites helps monitor and visualize plant performance kpis across multiple systems and machines in customized dashboards. This enables swift identification and resolution of issues, and plan maintenance schedules to minimize downtime and maximize availability across sites.



### Intelligent optimization

By providing multi site data monitoring for equipment usage, manufacturers can identify underutilized assets and optimize their allocations across sites. This improves overall equipment effectiveness (oe) and productivity.



### Predictive maintenance

Hosting iiot data streams from the various sites, helps analyze real-time and historical data to predict equipment failures and optimize maintenance strategies, improving overall efficiency.

## Target outcomes



**10-30%**

Increase in overall equipment effectiveness



**10-15%**

Reduction in operating expenses



**20-50%**

Inventory reduction



Eliminate data silos through effective data integration

Source: Accenture Research



Comprehensive asset management from strategy to deployment with proven success.

**End-to-end asset management transformation**, from strategy to implementation to managed services, leveraging the digital ecosystem.

**Broad range of Accelerators** ready to deploy methods, tools, diagnostic assets for different phases of client journey to accelerate value.

**2500+ skilled and dedicated MES/OEE improvement resources** globally in process and technology helping speedy deployment and quick realization of benefits

**Proven track record** with Accenture being recognized leader in Manufacturing productivity improvement space.



Fully managed, secure IoT platform allowing to millions of devices.

**Complete industrial IoT solution** through a set of fully managed services that are easy to deploy and manage.

**Collect, store, and analyze** device data through specifically designed services, even in noisy, unreliable environments.

**Massively scale** by allowing industrial IoT applications to connect to millions of devices.

**Secure** device fleets at scale with built-in device authentication and authorization to keep IIoT data and devices protected.



Transform industrial operations with seamless, secure connectivity.

Offers **End-to-end ruggedized edge hardware and, AWS-powered software platform** to improve OEE management for manufacturers

**Plug-and-play:** Secure and resilient network backbones that connect industrial assets in minutes.

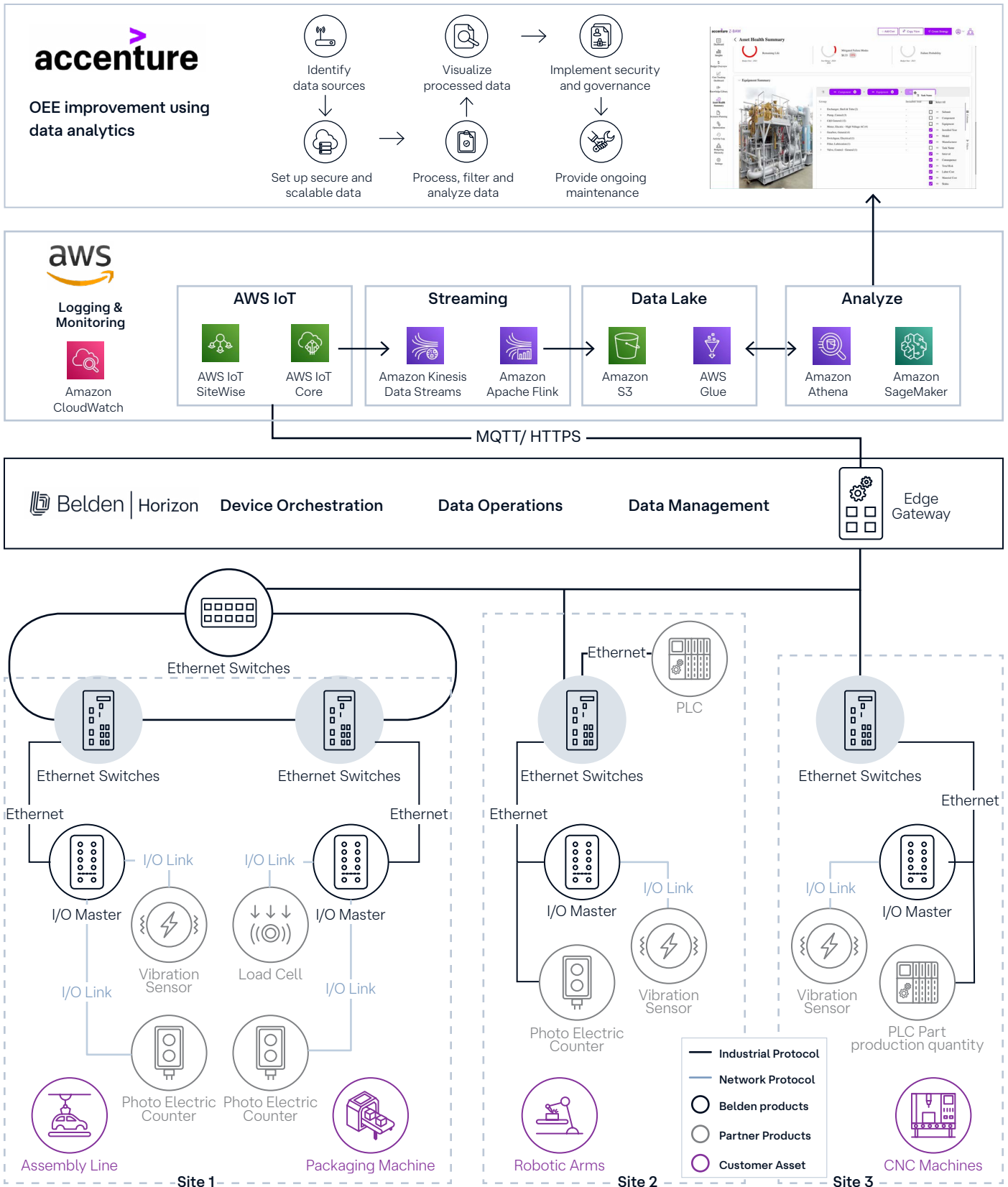
**Near real-time insights** with edge computing on industrial gateways.

**Vendor-agnostic:** Convert 275+ industrial protocols to easily consumable formats.



# Turning data into insights

An overall equipment effectiveness solution can help manufacturers achieve new levels of efficiency and equipment health. The network diagram below shows how Belden hardware and software can be combined with offerings from AWS and Accenture to transform field-level data into a real-time insights needed to help manage the effectiveness of the asset.



# Case study: OEE improvement with real-time operational insights for a global high-strength fasteners and form parts manufacturer

When a global high-strength fasteners and form parts manufacturer realized there was a lack of real-time production output tracking and reporting, they came to Belden. The experts at Belden delivered a solution that acquired and transmitted data from field devices into a cloud-hosted IIoT platform for proactive machine monitoring. With the right data and insights now in hand, the company was able to achieve reduced waiting times and improve on overall efficiency.

## Challenges:

- Lack of real-time production output tracking and reporting
- Manual, time-consuming inventory counting process
- Difficulty in assigning skilled operators to higher value tasks
- Concerns about data privacy and labor union issues with camera-based solutions
- Perceived complexity in connecting operational technology (OT) data to cloud



## Solution:

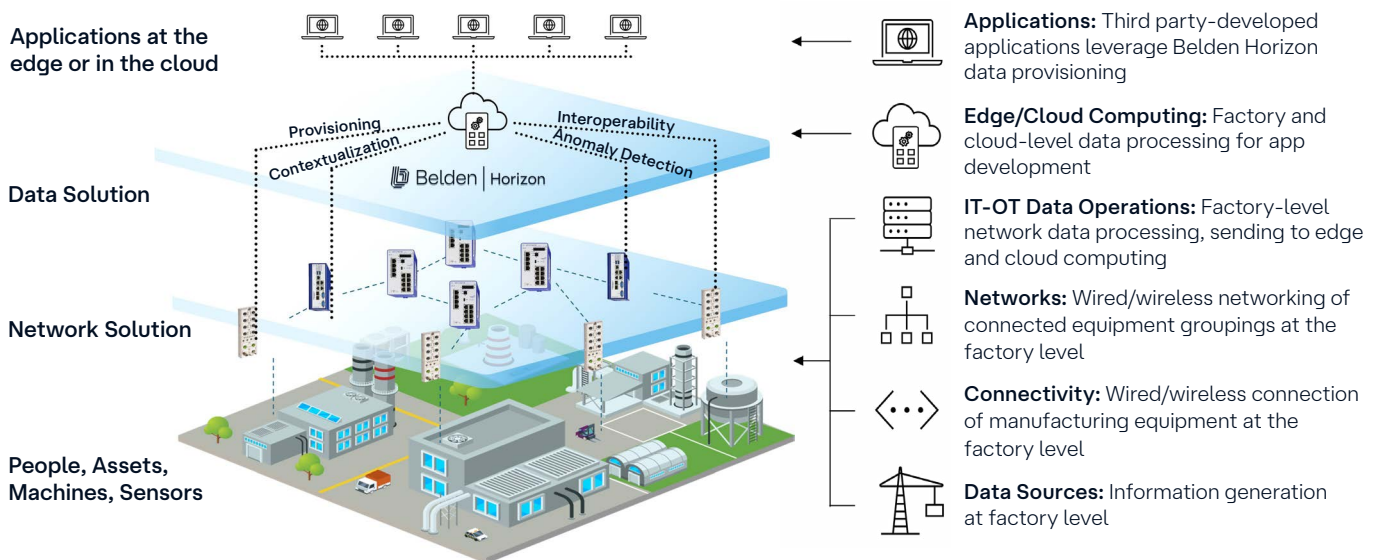
- Sensor-based bolt counting system with high-resolution light grid sensor for accurate production tracking
- Secure OT to AWS connectivity via edge gateway for seamless data integration
- AWS IoT Greengrass for preprocessing operational data before sending to AWS IoT Core
- AWS Lambda functions for production KPIs and machine performance monitoring
- Mobile app and SAP ERP integration for real-time data access and order fulfillment

## Results:

- 2.5%-3.5% increase in operator time on higher value tasks due to proactive
- Optimized forklift routes and reduced waiting times
- Improved visibility for production planning and supply chain
- Reliable and secure solution with remote management, ensuring data privacy compliance
- Seamless OT data integration with cloud analytics, eliminating need for additional expertise

## The future of data convergence

Belden Horizon is a scalable, vendor-adaptable digital platform that encompasses our products and software, unifying data from disparate sources to deliver clean, analytics-ready information.



Belden engaged a variety of Cloud Service Provider and system integrator partners for joint sales and delivery of these use cases. Partners mentioned in this document are for indicative purposes only.





**Belden's network and data solution** connects various energy monitoring and consuming assets to energy management applications.

**Step 1: Build a resilient network to gather energy data using a combination of I/O systems, cordsets and managed switches.**



**BOBCAT:** Managed switch for compact IIoT networking with advanced security, high port count and real-time communication.



**I/O systems** portfolio offers intelligent and reliable data transmission solutions from passive distribution boxes, fieldbus and modular I/O systems to high-performance modules.




Broad range of single-ended and double-ended **cordsets** for faster, easier installation and maintenance, delivering optimum signal protection.

**Step 2: Activate edge computing to convert, contextualize and analyze data and run custom apps.**



**OpEdge-8D:** DIN-rail-mount edge gateway device for processing large volumes of operational data generated in industrial environments on the edge infrastructure.

**Step 3: Enable data interoperability to convert, contextualize and provision analytics-ready data to the cloud or other data destinations.**

 **Belden Horizon:** Industrial remote connectivity and edge orchestration software platform enabling connection to OT assets and deploying AI models.



**ProSoft Gateways:** Enable dissimilar automation control equipment to share information and transfer control data through wired and wireless connectivity.



**CloudRail.Box Max:** Plug-and-play industrial edge gateway supporting connectivity methods like Secondary Sensors, OPC-UA, Modbus, and VSE.



**Amazon IoT Core** managed cloud platform that enables secure device connectivity and data processing at scale.



**AWS IoT SiteWise** simplifies industrial data collection, organization, and analysis at scale.



**Amazon Kinesis Data Streams** processes high-velocity IoT data for real-time analysis and insights.



**Amazon Managed Service for Apache Flink** dataflow engine for real-time data stream processing on high-throughput data sources with low latency.



**Amazon S3** enables storage of high-velocity IoT data, like sensor data from IIoT devices, for real-time data processing and analysis.



**Amazon Glue** is a serverless data integration service that simplifies data discovery, preparation, and transformation for analytics.



**Amazon SageMaker** is a fully managed ML service enabling custom model to develop, train and deploy for IIoT analytics.



**Amazon Athena** offers a serverless, interactive query service for easy data analysis, providing fast performance and flexible pricing models.



**Amazon CloudWatch** provides real-time visibility into system performance, operational health, and resource utilization.



**Amazon Managed Grafana** is a fully managed service based on open-source Grafana that makes it easier for you to visualize and analyze your operational data at scale.

**Key Deliverables:**



**Identify data sources** sensors, systems, services to be integrated for asset monitoring.



**Set up secure & scalable data** ingestion and storage for the identified sources in real-time.



**Process, filter and analyze data** to leverage Data Analytics for extracting meaningful insights and patterns.



**Visualize processed data** on dashboard, report & recommend insights enabling stakeholders to make data-driven decisions.



**Implement security and governance** adhering to security best practices & regulatory requirements.



**Provide ongoing maintenance,** monitoring, and support to ensure the IIoT solution continues to operate effectively.



**Accenture Operations Twin** is an extensible framework offering pre-built templates for specific use cases like Plant Control Tower and Production Asset Manager. Provides real-time visibility into plant performance, enabling data-driven decisions to optimize overall equipment effectiveness (OEE) and drive operational improvements.



**Accenture and AWS partnership:** With more than **26,000 certified AWS professionals and 45+ AWS-awarded qualifications,** Accenture provides highly differentiated joint and aligned execution with AWS to address our client's toughest challenges.



Solution Brief



[Click here](#) to know more about how to manage your overall equipment effectiveness and improve on efficiency.

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## About Belden

Belden Inc. delivers the infrastructure that makes the digital journey simpler, smarter and secure. We're moving beyond connectivity, from what we make to what we make possible through a performance-driven portfolio, forward-thinking expertise and purpose-built solutions. With a legacy of quality and reliability spanning 120-plus years, we have a strong foundation to continue building the future. We are headquartered in St. Louis and have manufacturing capabilities in North America, Europe, Asia, and Africa.

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