Belden

Asset Performance Management
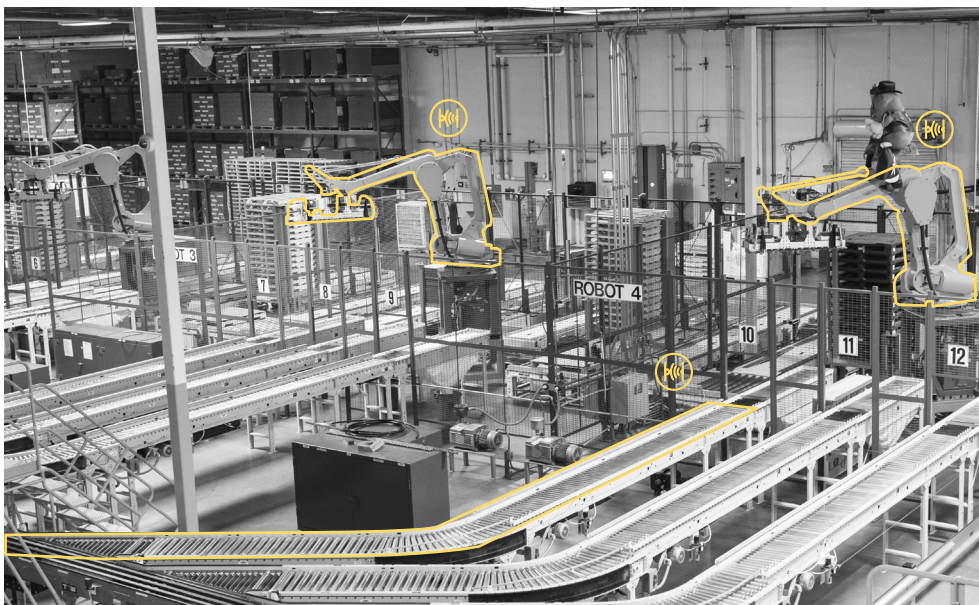
Solution Brief

Maximize asset performance and optimize the bottom line by unlocking the full potential of your assets.

Asset Performance Management (APM) optimizes the performance and efficiency of your assets throughout their lifecycle, transforming asset management from reactive to proactive. By leveraging advanced predictive analytics, APM allows you to anticipate potential issues before they occur, reducing downtime and maintenance costs while maximizing asset efficiency.

This data-driven approach ensures continuous, reliable performance and aligns asset management strategies with your business goals, ultimately enhancing productivity and maximizing return on investment (ROI).

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aws PARTNER

Current state and typical challenges

Discrete manufacturing industries are trying to addresses the challenges of unpredictable equipment failures, high maintenance costs, and the need for maximizing asset utilization through asset performance management. By integrating AI and ML data analysis, these solutions provide deep insights into asset health and performance, enabling predictive maintenance strategies. Major challenges faced by these manufacturers fall into the following categories:

Operations

- Increased unplanned downtime & process upsets
- Increased operational costs and reduced yield

Maintenance

- Ad-hoc, reactive maintenance of assets
- Increasing failure of ageing assets

Data management

- Siloed operations with disparate systems
- Uncertainty in analytics implementation costs
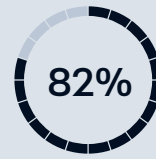- Enterprise-wide view of APM data not available

Inventory management

- Absence of activity-based inventory planning
- Difficulty in predicting accurate demands

Asset functionalities

- Inability to meet critical business functionalities
- Excessive customization leads to ineffective usage
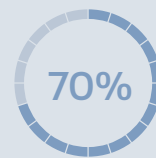- Difficulties in integration with 3rd party solutions

Asset performance management in discrete manufacturing

82% of manufacturers believe flexibility and the ability to dynamically shift production or product mix is critical to achieving growth goals.

>60% of capacity losses (after schedule losses) are due to equipment not being able to produce up to capacity.

70% of investments in new industrial assets will fully incorporate intelligent design features by 2026.

30 years to 50+ years is the amount of time Industrial Intelligent Assets typically operate.

Source: Accenture Research

Addressing key priorities

In many manufacturing organizations, monitoring the performance 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 we 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.

Asset performance management interventions

Real-time visibility

Real-time asset visibility enables precise tracking, optimizing usage, and reducing downtime. This ensures efficient allocation and streamlined operations, enhancing productivity, cutting costs, and improving decision-making.

Intelligent optimization

By providing visibility into asset usage, asset operators can identify underutilized assets and optimize their allocation. This improves overall equipment effectiveness (OEE) and productivity.

Predictive maintenance

Product failure analysis and predictive maintenance. Analyze real-time and historical data to predict equipment failures and optimize maintenance strategies, improving asset efficiency.

Target outcomes

10-15%
Decrease in asset downtime

10-15%
Cutdown MRO inventory

2-5%
Improved throughput

25%
Optimized workforce productivity

Source: Accenture Research

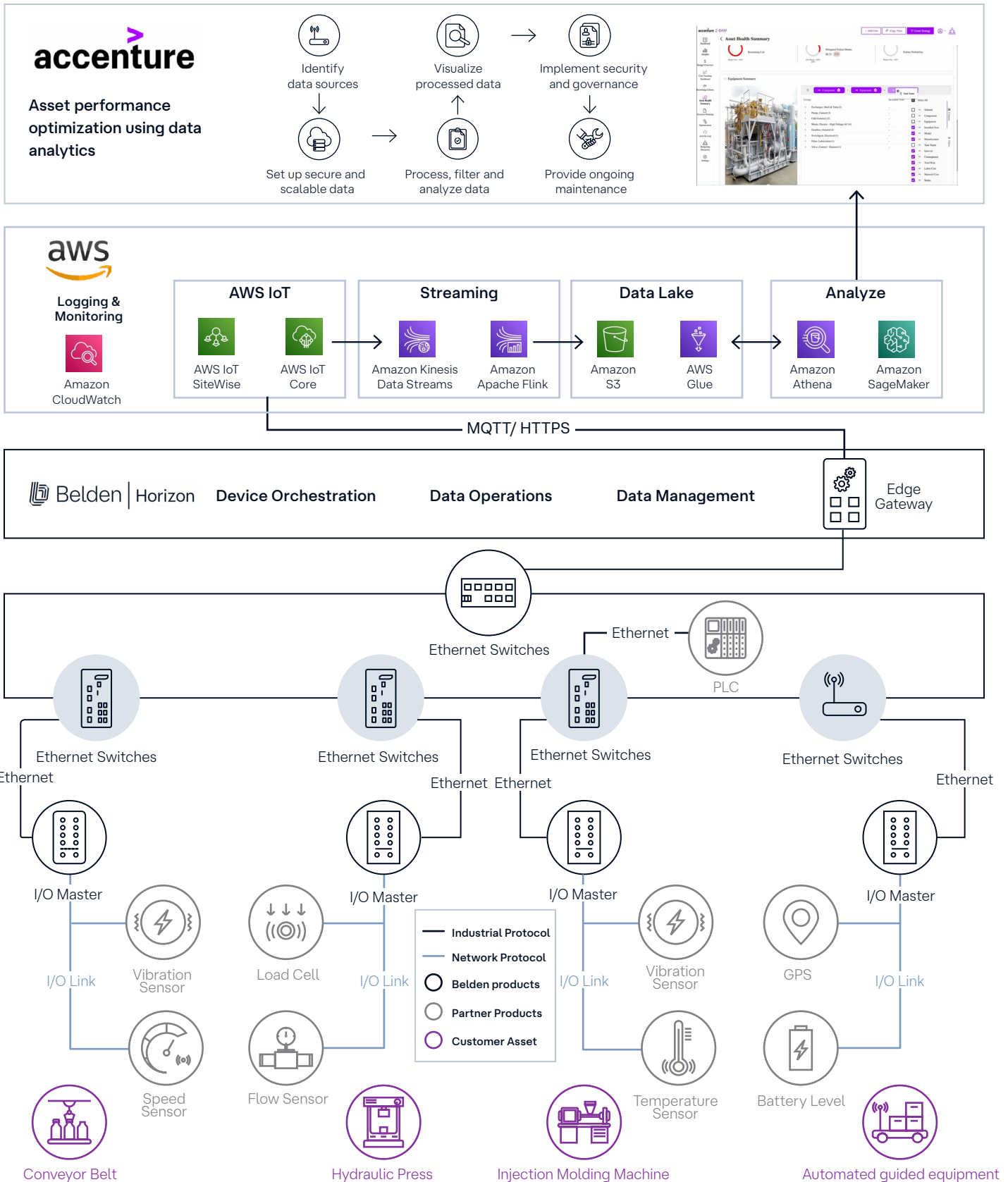|				
accenture **Comprehensive asset management from strategy to deployment with proven success.**	**End-to-end asset management transformation,** from strategy to implementation to managed services, leveraging the digital ecosystem.	**Broad range of Accelerators** ready to deploy methods, tools, diagnostic assets for different phases of client journey to accelerate value.	**1400+ skilled and dedicated IAM resources** globally in process and technology helping speedy deployment and quick realization of benefits.	**Proven track record** with Accenture being recognized leader in IAM space.
aws **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.
Belden **Transform industrial operations with seamless, secure connectivity.**	**Offers End-to-end ruggedized edge hardware and, AWS-powered software platform** to improve asset performance 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 asset performance management solution can help manufacturers achieve new levels of efficiency. The example 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 performance of the asset.

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Asset performance optimization using data analytics

Identify data sources

Set up secure and scalable data

Visualize processed data

Process, filter and analyze data

Implement security and governance

Provide ongoing maintenance

accenture 2-BAM — Asset Health Summary

aws

Logging & Monitoring

Amazon CloudWatch

AWS IoT
AWS IoT SiteWise

AWS IoT Core

Streaming
Amazon Kinesis Data Streams

Amazon Apache Flink

Data Lake
Amazon S3

AWS Glue

Analyze
Amazon Athena

Amazon SageMaker

MQTT/ HTTPS

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Device Orchestration   **Data Operations**   **Data Management**

Edge Gateway

Ethernet Switches

Ethernet

PLC

Ethernet Switches

Ethernet

Ethernet Switches

Ethernet

Ethernet

Ethernet Switches

Ethernet

Ethernet Switches

Ethernet

I/O Master

I/O Master

I/O Master

I/O Master

I/O Link

Vibration Sensor

Load Cell

I/O Link

Vibration Sensor

GPS

I/O Link

Speed Sensor

Flow Sensor

Temperature Sensor

Battery Level

Conveyor Belt

Hydraulic Press

Injection Molding Machine

Automated guided equipment

Legend
— Industrial Protocol
— Network Protocol
○ Belden products
○ Partner Products
○ Customer Asset

Case study: asset performance management for a baggage handling system in an international airport

When a major airport faced challenges with managing and maintaining their baggage handling system (BHS) due to its complexity and scale with some systems managing more than 70 million bags annually, they turned to Belden for a solution. Our experts provided a comprehensive solution that streamlined the monitoring and maintenance of their BHS, ensuring continuous and efficient operation. With the system deployed, the airport was able to significantly improve its operational efficiency, leading to a smoother baggage handling process and increased customer satisfaction.

Challenges:

- Managing 7,000 assets for 70 million annual bag transactions.
- Unplanned critical asset downtime disrupting asset availability and operations.
- Inefficient preventative maintenance and over reliance on manual checks.
- Poor spare parts management due to lack of real-time monitoring, leading to delays and increased costs.
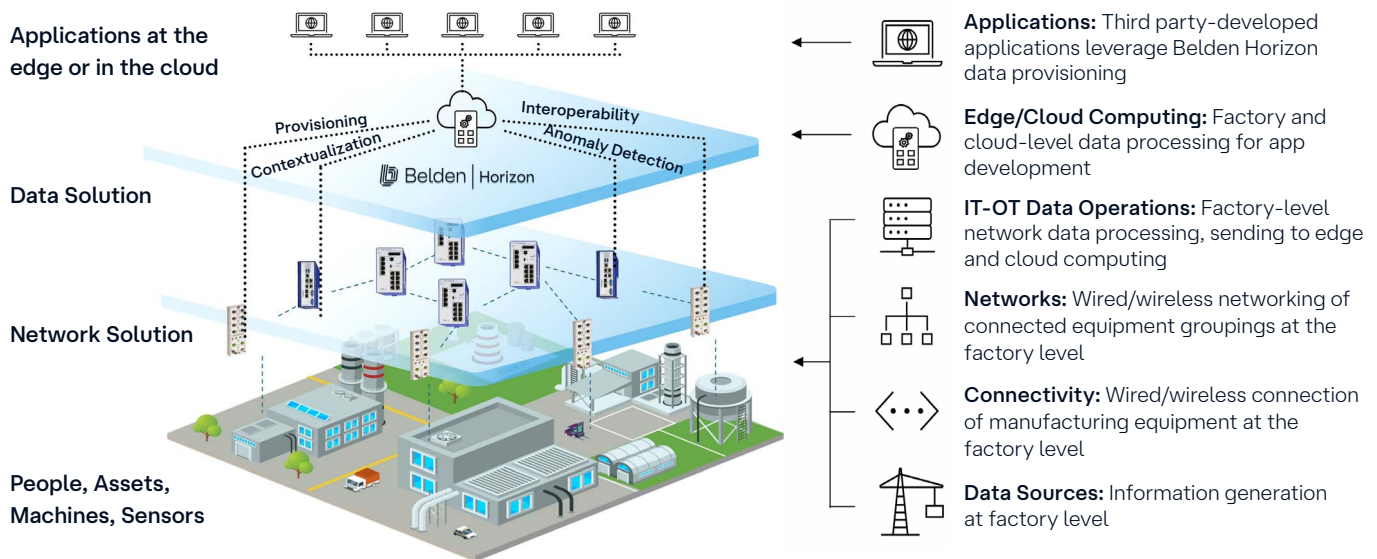
Solution:

- Belden recommended 3rd party sensors integrate with assets for real-time data collection.
- Real-time data transmission to AWS IoT Core.
- AWS services analyze data to predict failures and optimize maintenance.
- Remote updates and configurations enhance asset security.
- User-friendly dashboards for real-time asset performance visualization.

Results:

- Substantial decrease in unplanned downtime.
- Proactive maintenance minimized manual checks, enhancing efficiency.
- Significant cost savings from optimized maintenance and reduced waste.
- Improved reliability and operational efficiency of assets.
- Scalable solution for future expansion across airport systems.

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.

Applications at the edge or in the cloud

Data Solution

Network Solution

People, Assets, Machines, Sensors

Applications: Third party-developed applications leverage Belden Horizon data provisioning

Edge/Cloud Computing: Factory and cloud-level data processing for app development

IT-OT Data Operations: Factory-level network data processing, sending to edge and cloud computing

Networks: Wired/wireless networking of connected equipment groupings at the factory level

Connectivity: Wired/wireless connection of manufacturing equipment at the factory level

Data Sources: Information generation at factory level

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.

Network and data foundation	Cloud infrastructure for data storage and processing	End user application and services
Belden	**aws**	**accenture**

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.

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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-through put 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.

Zero-Based Asset Management Application Suite with data-based decision making. Allows optimization of asset maintenance activities and costs. Zero-ased planning and budgeting for maintenance.

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

Scan to Contact us

[Click here](#) to learn more about how to maximize asset performance and optimize the bottom line by unlocking the full potential of your assets.

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.

For more information, visit us at:
belden.com

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