Maximize asset reliability and performance with AVEVA's integrated solutions

In today's fast-paced world, industrial operations face numerous challenges that are unprecedented in both speed and complexity. While these challenges are certainly difficult, they also present opportunities for innovation and growth. Reinventing supply chains in response to shifting market dynamics opens avenues for innovative strategies and technologies.

While commodity price fluctuations impact profitability, they also drive companies to explore more efficient and sustainable practices. Software solutions that enhance workforce productivity and collaboration can address labor force transitions and the shortage of skilled workers. The aggressive shift to green energy and new technologies is a powerful catalyst for innovation in operational efficiency and sustainability.

Many organizations are already using point solutions to accomplish individual goals, but today's market challenges demand more. Using AVEVA™ PI System™ products as the industrial data management foundation and integrating AI-enabled analytic solutions allows companies to achieve significant increases in asset reliability and performance, while simultaneously reducing downtime and maintenance costs.

AVEVA

The importance of industrial intelligence

While the fundamental principles of manufacturing and critical infrastructure — such as the use of PLCs, controllers, and control theories — remain unchanged, significant transformations are underway. Market forces and technology advancements, including cloud computing, AI, and mobility solutions, are enabling new ways of working. The race to break down silos and leverage a flexible digital backbone is crucial for supporting remote work and greater collaboration and adapting to future changes and disruptions.

Enabling the connected industrial economy

Imagine a future where industrial teams collaborate seamlessly across the globe in a fully connected world. In this connected industrial economy, data collection, data contextualization, and data sharing are essential. At AVEVA, we believe in an interdependent, digitally connected industrial economy that encompasses customers, vendors, suppliers, partners, and communities. Moving beyond traditional silos in data connectivity, functionality, and stakeholders is key to thriving in this new era.

Powering digital twins for asset reliability

The next evolution of industry will make use of robust digital twins that connect data, models, analytics, and visualization. Managing a digital twin includes consolidating data from monitoring systems, process equipment, utility systems, and other relevant sources.

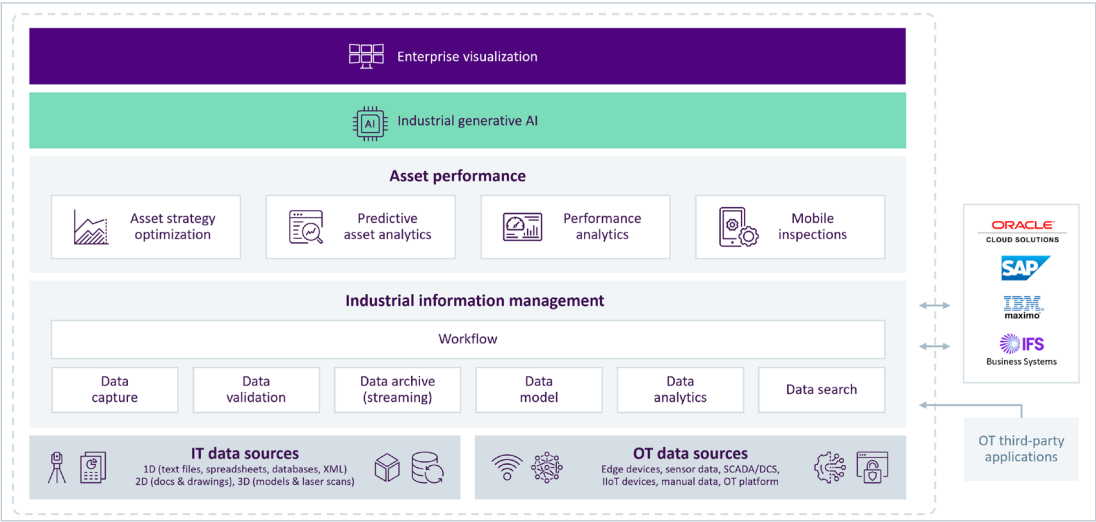
From there, managers will use no-code analytics that are easily scalable and adaptable across the business, and provide fit-for-purpose visual experiences that deliver actionable insights to various user roles, from management to engineers.

For example, an industrial facility produces massive amounts of data throughout its lifecycle, starting from capital project design and continuing through operations, optimization, and finally decommissioning. Collecting and verifying data is essential to building a trusted digital twin, which can help increase revenue and reduce expenses. Unfortunately, among both engineering, procurement, and construction (EPCs) companies and owner-operators, data is often siloed across various teams and systems, making it difficult to gather, validate, and turn into actionable information.

The foundation for asset reliability: A flexible, hybrid data solution

Creating an end-to-end data management solution that can easily integrate AI-enhanced and predictive analytics is key to achieving ROI and fast time-to-value.

With a powerful, cloud-based solution that aggregates real-time and historical information from multiple sources and in varying formats into a single source of truth, users across the business can securely access, visualize, validate, contextualize, and collaborate.



An integrated asset reliability solution connects all stages of the production process, allowing industrial operations to strategize, monitor, predict, maintain, and visualize, optimizing performance and enabling end-to-end reliability.

AVEVA data management solutions provide a flexible hybrid architecture, allowing organizations to locate data storage and processing where it is most efficient for data users. For example, industrial operations can feed edge data directly to local applications to support field engineers or aggregate data from multiple plants or sites in the cloud to support enterprise-level monitoring and analysis. With a cloud-based data hub, users can easily share data with third-party data scientists and service providers.

AVEVA™ PI Data Infrastructure, based on AVEVA™ PI System™, not only aggregates and contextualizes data to create a single source of truth, it also:

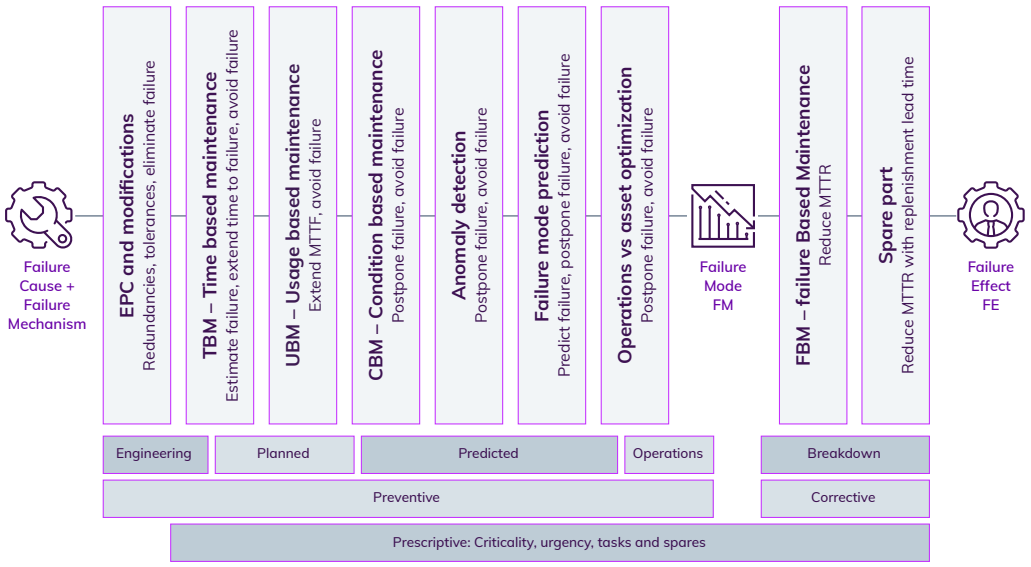
- Delivers insights across the entire asset lifecycle, from initial deployment to standard operation to optimization
- Converts multiple and disparate information formats into consolidated, actionable information
- Creates a 360°-view of an asset with detailed information and class-leading information standards management
- Validates data to create a master dataset for operational use
- Accelerates automatic asset discovery and links users to a common dataset
- Enables real-time performance monitoring that is used to increase asset reliability, minimize unplanned downtime, and optimize performance
- Improves reliability of safety and regulatory compliance reports
- Ensures smooth, progressive handover from EPCs to owner-operators

Building a proactive asset strategy fuels reliability and performance

At the heart of every successful industrial operation is a solid asset strategy. A well-designed asset strategy leverages the data foundation to provide a clear view of industrial assets, highlighting where new technologies will offer the biggest returns. Not only will an asset strategy allow users to identify where to start for the fastest and most impactful results, it also ensures the quick wins needed to demonstrate the value of deploying AI and data intelligence solutions.

By defining which assets are critical to business objectives such as health, safety and environment, compliance, cost, availability, and sustainability, industrial operations can budget both time and investments appropriately to maximize reliability while gathering the insights needed to plan future investment and maintenance needs. In almost all cases, an asset strategy is a combination of different maintenance strategies within a risk-based maintenance strategy.

Asset Strategy Optimization: Strategies that mitigate failures to an acceptable level

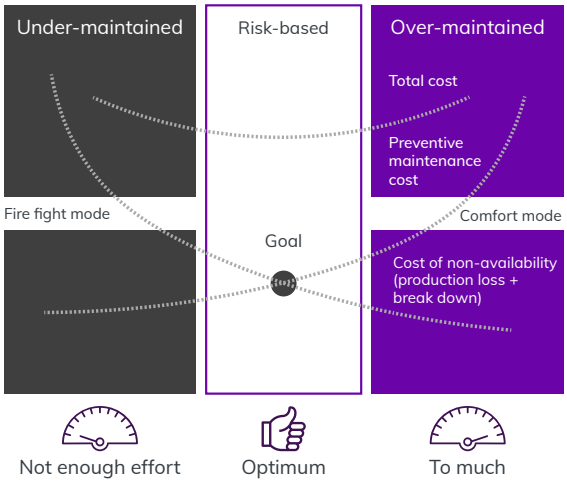


A robust asset strategy takes a proactive and predictive approach to asset management.

With the asset right strategy in place, organizations can move from reactive asset management to a preventative or even predictive approach. Using predictive analytics, industrial operations can use real-time data to anticipate outcomes, such as asset failures or other performance deviations, to find the right balance between under and over-maintaining assets. This risk-based approach uses AI and data intelligence to optimize asset performance along with underlying maintenance strategies, maximizing overall asset reliability.

The goal of risk-based maintenance

Find the optimum



Insight into risks
Balance between financial operational and safety risks

Ever-changing legislation
Complying with environmental and social requirements

Sharing knowledge
Implement best practices globally

Continuous improvement
To drive maximum return on industrial assets

Risk-based maintenance finds the optimum balance of performance against cost and acceptable risk.

Integrating AVEVA data management and predictive analytics to achieve next-level reliability and performance

By combining real-time and historical information from AVEVA PI System with AVEVA's AI-infused analytics solutions, industrial operations can capitalize on the data foundation to increase data intelligence — and improve reliability, performance, safety, sustainability, and profitability. Many organizations begin by using real-time data from assets themselves or their physical environment to adopt condition-based maintenance (CBM) to identify out-of-range operating conditions. Then users can go one step further to use the data to perform predictive analytics, which uses AI and ML to learn the unique operating signature of each asset. From this baseline, these tools adapt to changing load, ambient, and operational conditions to alert operators about potential asset failures weeks or months before they occur.

This level of data intelligence enables asset managers to proactively assess equipment and schedule maintenance activities at the most economically advantageous time.

Being proactive allows companies to increase asset reliability and reduce unscheduled downtime. Operations and maintenance personnel also can be more proactive and, rather than tripping the unit or immediately reducing load, they can forecast time to failure and shift loads to reduce asset strain or find alternative ways to optimize outcomes before they can perform the necessary maintenance.

The integration of AVEVA solutions for data management and AI-enriched analytics reduces the time and effort of preparing and delivering the data for processing, resulting in faster and more accurate intelligence.

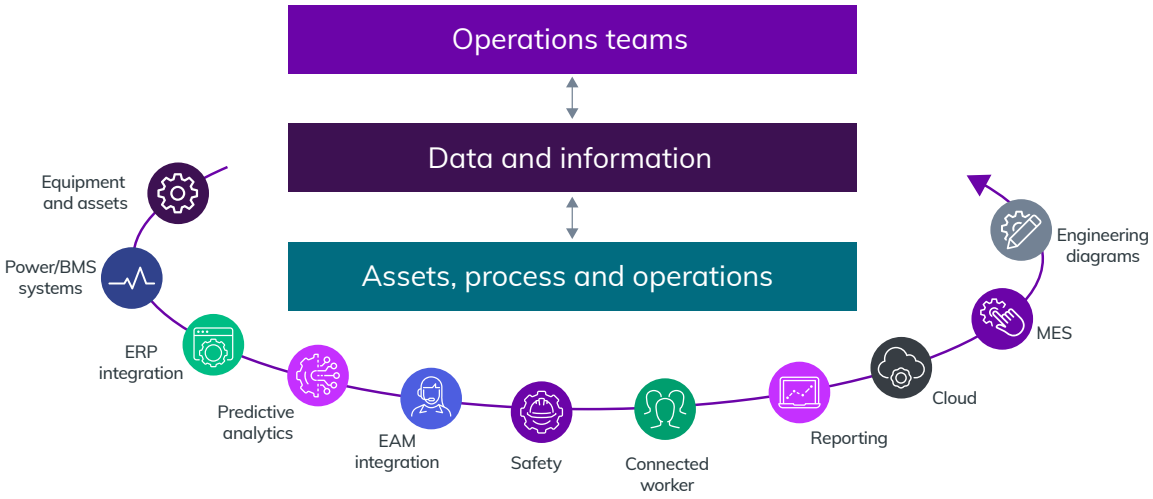
In addition, AVEVA™ Predictive Analytics:

- Operationalizes AI at scale in minutes instead of weeks or months
- Allows for point-and-click model building so users can deploy models in minutes versus hours, with no programming or data science needed
- Offers best-in-class deep fault diagnostics including time-to-failure forecasting

- Combines over 22,000 man-hours of experience in a prescriptive asset library, helping users remediate failure and minimize repair time
- Automates model building to deploy at scale for fast time to value
- Seamlessly integrates with AVEVA PI System to reduce manual errors and provide consistency that drastically improves maintainability
- Delivers over 15 years of experience in AI-based predictive analytics at scale
- Signals bad actors and excludes malfunctioning sensors from analyses
- Forecasts time-to-failure and end-of-life to enable sustainable maintenance decisions
- Predicts process behavior and uses hypothetical scenarios to determine the optimal time to perform maintenance

Maximize data intelligence with fit-for-purpose visualization

Maximizing the use of analytic tools and data intelligence requires effective data visualization. Real-time, end-to-end visual performance guidance can bring together data from capital project design and build systems, operations, performance monitoring and asset maintenance, enabling teams to gain a connected, 360-degree view of data from across the organization. More complete visibility provides the insight needed to enhance agility and optimize operations. With user-focused visualization, engineers and analysts can view a custom-designed combination of process metrics, maintenance analytics, engineering documentation, financial performance, and more, replacing siloed data from disparate systems with contextually aligned information about the business.



Visualization breaks down data silos to unify teams, data, and assets, creating a connected working environment.

Enterprise visualization connects people through data, whether they are located on-site or are remote, to facilitate collaboration, reveal new insights, and establish a feedback loop from a common interface.

Visualizations offer a comprehensive perspective that brings new insights in complex and multi-site operations. The greater understanding that results can not only drive reliability on the front lines, but also improve plant reliability, safety, and profitability.

Enabling end-to-end asset reliability with AVEVA

AVEVA's comprehensive portfolio of solutions can be seamlessly integrated to create an AI-infused end-to-end data intelligence and reliability solution to gain new levels of awareness and insights to maximize asset reliability and performance.

AVEVA™ PI Data Infrastructure is a flexible, hybrid data management solution that makes it easy to aggregate, enrich, store, access, analyze, and securely share real-time industrial data. The solution combines the capabilities of AVEVA™ PI Server™ on-premises with AVEVA Edge Data Store and CONNECT data services in the cloud. These components are integrated to collect, contextualize, and aggregate data generated by multi-vendor systems on-premises or by remote, mobile, or IIoT assets. Data is automatically cleansed and formatted and can be delivered to a wide variety of users, tools, and applications in any location, without the need for programming.

In addition, AVEVA's Industrial AI Assistant will bring generative AI to CONNECT, our industrial intelligence platform. By combining the customer's industrial data and a large language model (LLM), the user can ask the system object-driven multi-step questions and requests in natural language with minimal setup required.

AVEVA™ Asset Strategy Optimization enables a risk-based maintenance strategy where users can simulate different maintenance strategies and effects to increase uptime, cost, safety, compliance or sustainability can be assessed to drive strategic decision-making.

AVEVA™ Predictive Analytics allows users to discover and diagnose equipment issues weeks or months before failure, reducing equipment downtime and maintenance costs, increasing reliability, and improving performance while reducing operations and maintenance expenses.

AVEVA™ Unified Operations Center delivers enterprise visualization that enables operations awareness and performance guidance in real time in one single-pane-of-glass. With AVEVA Unified Operations Center users can enhance strategic visibility by converging engineering, operations, and business data in context and gain an end-to-end view of global or regional operations performance.

AVEVA™ Mobile Operator gives teams the tools they need to optimize fieldwork best practices in operations, reliability, HSE, and maintenance, ensuring procedural compliance during routine maintenance and operator rounds. Users can implement standard work execution and workforce knowledge transfer, giving teams access to immediate information at the point of incident and offering prescriptive "how to" information to alleviate the problem. With structured mobile workforce enablement, organizations can take a proactive approach to operations to accelerate and sustain process improvements.

Flexible hybrid architecture

AVEVA solutions are available using a flexible hybrid architecture, allowing organizations to locate data storage and processing where it is most efficient for data users. For example, industrial operations can feed edge data directly to local applications to support field engineers or aggregate data from multiple plants or sites in the cloud to support enterprise-level monitoring and analysis. With a cloud-based data hub, users can easily share data with third-party data scientists and service providers.

Flexible purchasing

AVEVA solutions are increasingly available as SaaS-based subscriptions, offering access to multiple components and priced according to the level of expected usage. This commercial model allows organizations to easily scale capacity and users up or down as business needs change. Flexible subscriptions also reduce upfront infrastructure costs and IT overhead, while supporting subscription management from a single interface rather than managing multiple licenses. Learn more about the AVEVA™ Flex Subscription Program.