

WHITEPAPER

Better together: AVEVA™ Predictive Analytics and the AVEVA™ PI System™ maximize mining plant ROI

Authored by:

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Executive summary:

Market and regulatory challenges are pushing leaders in the mining industry to look for new ways to optimize the efficiency, reliability, and performance of their operations. To make the most of their assets and investments, industry leaders are layering AVEVA Predictive Analytics into AVEVA PI System, which paves the way for cutting-edge predictive maintenance strategies. Combining the power of AVEVA PI System with AVEVA Predictive Analytics enables mining companies to reduce downtime and costs, maximize production and reliability, and thrive amidst increasingly tough competition.”

Introduction

From volatile markets and tough competition to the increasingly stringent demands of government regulators and customers alike, there's no shortage of challenges ahead for the mining industry. To navigate these obstacles and others all while improving profitability, mining companies are seeking innovative ways to optimize the reliability, efficiency, and safety of their operations. Many industry leaders are already finding the answers they are looking for in their operations data.

A modern mining outfit produces massive quantities of data day in and out. Hidden in all that data lies valuable insights, and in those insights lies the potential to help companies maximize production, reduce unplanned downtime, and optimize processes. This is why so many mining companies are already using the PI System as their data management platform to collect, manage, and analyze vast stores of historical and real-time operations data. The PI System enables mining companies to build sophisticated data management foundations, which enable, in turn, the transition to predictive maintenance and the use of more advanced digital tools, including predictive analytics, digital twins, augmented reality, and more.

Saving big with predictive maintenance:
Deloitte estimates that, by moving to predictive maintenance, mining and metals operations can reduce maintenance planning time by 20-50% and reduce overall maintenance costs by 5-10%.

Now, the most cutting-edge mining companies are incorporating AVEVA Predictive Analytics into their data strategies to get more value from their PI System investments and bolster their digital transformation initiatives. AVEVA Predictive Analytics provides early warning notification and diagnosis of equipment issues days, weeks, or months before failure. Together, the PI System and AVEVA Predictive analytics deliver faster, more valuable insights, which enable mining operations to streamline processes, improve asset performance, and achieve more reliable, predictable out-comes.

Case study: Votorantim Cimentos goes predictive

For some time, Votorantim Cimentos, Brazil's largest cement manufacturer, had already been using the PI System as its data management platform. In 2018, in an effort to improve asset performance and reduce the cost of maintenance across all its operations, Votorantim Cimentos set out on the next phase of its digital transformation: the transition to predictive maintenance.

To make this switch from a reactive, condition-based maintenance strategy to a more data-driven, proactive approach, the company chose AVEVA Predictive Analytics. With business sites all across the world, Votorantim Cimentos needed a solution that it could deploy and scale quickly. The user-friendly interface of AVEVA Predictive Analytics also satisfied another of the company's top priorities: it allowed teams to operate independently, and to keep full control of their data through each stage of the implementation and optimization process.

The solution deployed rapidly and began showing results just as quickly. Across six initial sites, predictive-analysis driven "catches" avoided \$5.5M in corrective maintenance costs per site. In the first year alone, savings totaled \$88M. Between 2019 and 2020, Votorantim Cimentos saw a 10% reduction in maintenance costs, and a 6% improvement in asset reliability, which virtually eliminated the need for any emergency maintenance purchases.

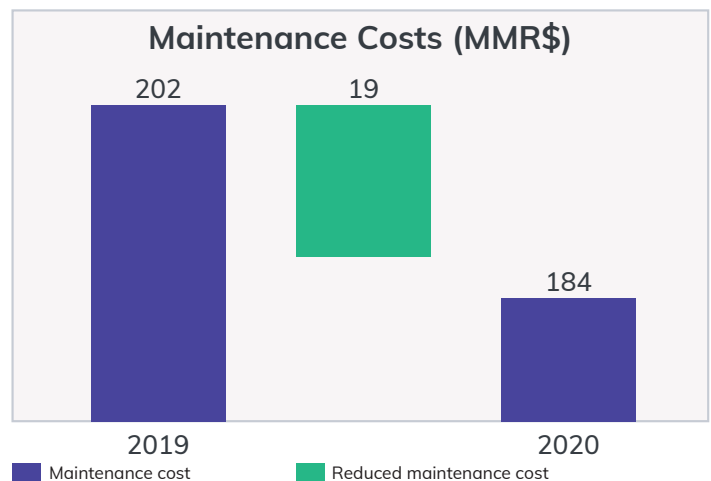


Figure 1: A dramatic decrease: Votorantim Cimentos reduced its annual recurring maintenance costs between 2019 and 2020 after deploying AVEVA Predictive Analytics on top of its existing PI System.

Now, AVEVA Predictive Analytics empowers the team not just to manage immediate maintenance needs, but also to plan and scale processes as needed, using the cloud to execute operations remotely.

Additional benefits

By combining contextualized PI System information with predictive analytics, operations, maintenance, and engineering teams can work together proactively to evaluate assets prior to failure and perform maintenance at exactly the right time. From there they can use predictive tools to optimize maintenance schedules, ensuring the best teams and resources are available, to minimize downtime and disruptions.

AVEVA Predictive Analytics uses deep learning tools to forecast an asset's remaining useful life, giving teams critical information and prescriptive guidance to minimize downtime and plan more effectively. Users can define meaningful lead indicators based on sensor and other operations data to determine in real time how these indicators will influence asset performance. Even if changes are subtle, the solution will predict performance degradation and component failures. Teams have visibility into each asset, from critical to least vital, and can use this visibility to manage processes based on urgency, criticality, necessary action, and spare part availability.

AI-driven process analytics also enable companies to minimize energy usage, predict quality deviations, and optimize throughput. These predictive insights help mining companies to meet both regulatory standards and contractual obligations by achieving better asset and process outcomes.

Deploying AVEVA Predictive Analytics on top of the PI System is easy. IT experts perform setup, users define the variables, and the model automatically finds relationships in the data. After training, operations personnel can manage the system with a self-service, no-code tool without the need for data-scientist expertise. Not only does this ensure rapid ROI, but user-defined variables and standard operating procedures enable knowledge capture, which minimizes the potential for disruption should any personnel leave the company.

Predictive analytics allow mining companies to capitalize on the wealth of data in the PI System to maximize return on investment. With access to real-time predictive insights in an intuitive interface, operations teams can easily measure the cost of inefficiencies, gauge future consequences, assess risk, avoid disruption, and even increase customer satisfaction.

The PI System curve: Is your organization ready for predictive analytics?

The PI System is an incredibly flexible data management platform, capable of serving your organization's needs wherever you are in your digital transformation journey – whether you rely on a data historian or a contextualized, single source of truth. Depending on how you're using the PI System, your company may be ready to reap the benefits of AVEVA Predictive Analytics.

Real-time data and the PI System facilitate the transition from reactive maintenance to preventative and condition-based maintenance (CBM). Contextualization ultimately supports CBM, enabling visualization, event detection and notifications, and the ability to stream analytics to trigger events and measure performance. For example, the PI System can send run-time information to a CMMS for its PM module to consume or send event notifications directly to CMMS to trigger automatic work orders.

Once mining companies have enabled these capabilities in the PI System, the foundation is ready to support AVEVA Predictive Analytics. Users can also integrate real-time data and event frames from the PI System into advanced tools, such as digital twins. The results from predictive models can often be returned to the PI System for use and visualization. From there, mining companies can begin a continuous cycle of improvement, using predictive analytics in conjunction with PI System capabilities to perform predictive maintenance and process optimization.

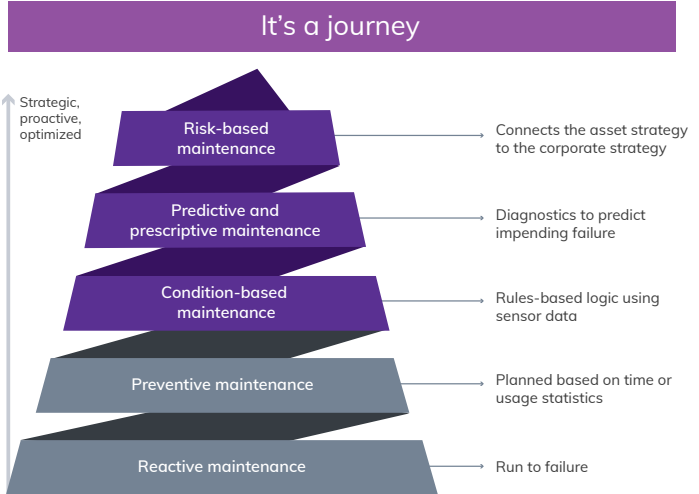


The maintenance journey: Moving to predictive or prescriptive maintenance strategies doesn't happen overnight. Users will need to lay the right data foundations and establish change management strategies to ensure optimal outcomes

Conclusion: More valuable insights, more reliable operations

The PI System provides the critical data management foundation for predictive analytics and other advanced digital tools. By layering AVEVA Predictive Analytics on top of the existing PI System infrastructure, mining companies can take advantage of real-time and historical operations data to gain rapid access to more valuable insights. And with these insights, mining companies can find the balance between risk-based and reliability-centered maintenance, improve performance, and avoid potential equipment failure.

AVEVA Predictive Analytics enables maintenance planners, systems engineers, controllers, and other plant personnel to make real-time decisions that improve performance, reliability, and the bottom line. By moving from events-based analysis to predictive and prescriptive guidance, users spend less time looking for potential issues and more time taking action to maximize the return on every single asset.



About AVEVA

AVEVA is a global leader in industrial software, driving digital transformation and sustainability.

By connecting the power of information and artificial intelligence with human insight, AVEVA enables teams to use their data to unlock new value. We call this Performance Intelligence.

AVEVA's comprehensive portfolio enables more than 20,000 industrial enterprises to engineer smarter, operate better, and drive sustainable efficiency. AVEVA supports customers through a trusted ecosystem that includes 5,500 partners and 5,700 certified developers around the world. The company is headquartered in Cambridge, UK, with over 6,500 employees and 90 offices in over 40 countries. Learn more at www.aveva.com.

About the PI System

The PI System is the leading operations data management platform in essential sectors, such as power generation and utilities, water, oil and gas, mining, metals, manufacturing, pharmaceutical, facilities, transportation, food and beverage, among others. Every day, industrial professionals in 146 countries rely on the PI System to improve operational performance, protect health and safety, keep the lights on, and make the world run more smoothly. Learn why two-thirds of Fortune 500 industrial organizations choose **PI System**.

About the author

Martin Provencher is AVEVA's global industry principal for mining and metals. He has more than 25 years of experience in operations and maintenance management and information technology. He is also vice president of the Maintenance Engineering and Reliability Society of the Canadian Institute of Mining.

His industry knowledge was acquired through different positions he held in his career, such as production director for casthouse and production services at Aluminerie Alouette, the largest aluminum smelter in the Americas, located in Quebec, Canada, where he managed operations and maintenance for seven different production areas.

Before that, Mr. Martin was the information technology and automation manager for Aluminerie Alouette, where he created a multi-year strategic plan to improve the plant's performance by leveraging technology. He has also been an active industry 4.0 speaker and influencer for IBM as the Quebec mining and metals leader in Canada.

Mr. Martin holds a bachelor's degree in computer science with artificial intelligence focus from the University of Quebec in Montreal.

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aveva.com/en/products/predictive-analytics

