



COVESTRO: USING THE PI SYSTEM™ TO DRIVE DYNAMIC DATA VISUALIZATION

Covestro's story is a common one in the manufacturing world. The company had a wealth of data streaming in from equipment and processes: data that could theoretically be harnessed and acted upon. But its data was difficult to access, stored in local silos, and cut off from sharing and analysis by the lack of enterprise-wide data standards.

The fix for Covestro: Making full use of its PI System. Instead of a series of data islands built around local PI System servers, Covestro now has a single data hub that allows for easy collaboration, advanced analysis, and access to real-time, context-rich data across the company.

With help from OSIsoft, a multidisciplinary team of engineers at Covestro built a flexible, accessible data hub from the ground up, first standardizing how data is captured and stored, then organizing it within a virtual model of the company's physical assets, and finally using the newly accessible data to build powerful visualization and simulation tools. The system gives Covestro engineers easy access to a variety of advanced analytics, from diagnosing problems with common manufacturing processes to using machine learning tools to detect anomalies, to performing advanced forecasts and scenario testing.

MANY SITES, ONE DATA SOLUTION

Headquartered in Germany, Covestro makes high-tech polymers, coatings, adhesives, and specialty chemicals. Covestro's materials find their way into a wide array of products and processes, from automotive coatings to high-tech sports equipment to building insulation. The company has 30 production sites worldwide, ranging from small innovation centers to large-scale manufacturing plants, and employs about 16,800 people.

For any company the size of Covestro, seamless integration of data across many users and

sites is a challenge. Through an initiative dubbed ProDAVis – Process Data Analysis and Visualization – Covestro engineers are using PI System tools to take data that was once sequestered in silos, and make it accessible and actionable across the entire enterprise.

The first step in building a centralized data architecture out of local servers was standardizing data naming conventions of PI tags. Once the tags were standardized, Covestro could unlock the full power of [Asset Framework \(AF\)](#), a contextualization layer of the PI System, that serves as a virtual model of the company's

CHALLENGE

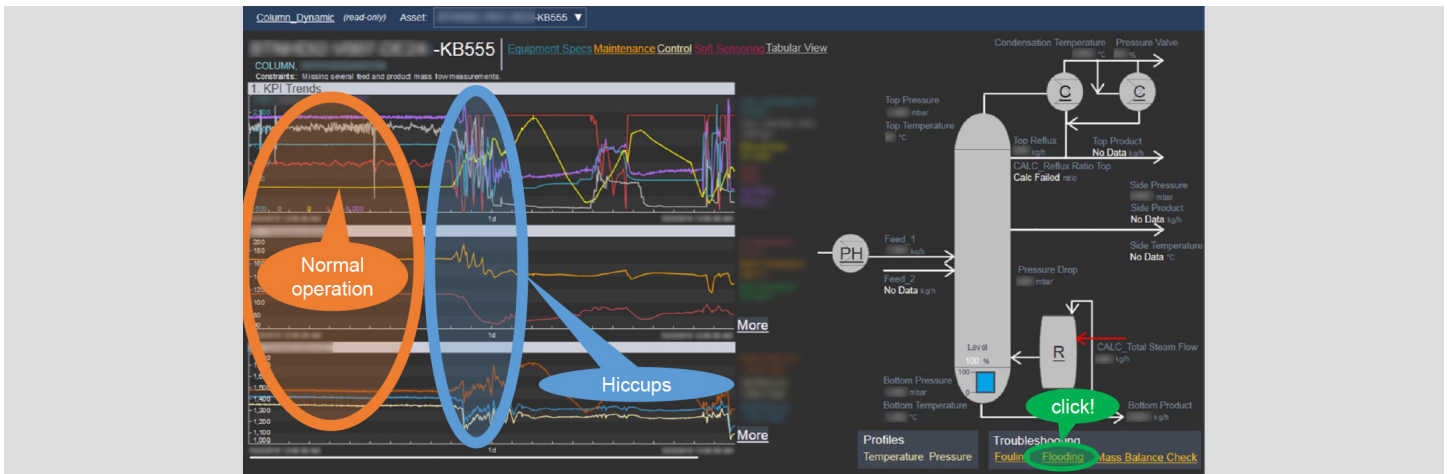
Covestro's data was isolated in local servers and difficult to access

SOLUTION

Move data from local PI System servers to a standardized central architecture based on Asset Framework (AF)

BENEFIT

Easy access to data now allows for enterprise-wide collaboration, dynamic visualization and advanced analysis



A PI Vision screen from Covestro's ProDAVis system demonstrates how one-stop-shop visualization from a distillation column allows engineers to quickly diagnose and troubleshoot problems.

assets. Common pieces of equipment – like, for instance, a pump or a distillation column – can be quickly modeled using AF templates, making it easy to plug a new asset on the plant floor into its rich digital context and allowing engineers to monitor the flow of processes in real time across the entire enterprise.

BEYOND THE ARCHIVE: SIMULATION, ANALYSIS AND PREDICTION

Context-rich digital modeling of physical assets is already enabling high-quality simulation, leading to faster detection of anomalies and driving real cost savings for Covestro. Robust simulations of processes can accurately interpolate missing data points, eliminating the need for expensive sensors. “Imagine the potential savings when considering that an installed field device measurement can cost several thousand euros,” said Esteban Arroyo, Global Data Analytics Expert at Covestro, during PI World Gothenburg 2019. “Besides that, this integration allows us to detect deviation between measured and simulated variables, which may indicate process anomalies.”

Once a process anomaly has been detected, the ProDAVis system helps engineers respond quickly and intelligently. Process deviations can be linked to specific process events, automatically triggering notifications that are sent when something in a process goes awry. Engineers monitor equipment using PI Vision dashboards that are integrated seamlessly with

third-party analytical tools, allowing experts to open an on-demand analytical session in Seeq or TrendMiner with the click of a button.

For more advanced analytical tasks like scenario testing for root cause analysis or forecasting to enable predictive maintenance, engineers can deploy machine learning tools from within the ProDAVis system. For instance, one tool from Fero lets engineers model the effects of different conditions on the heat transfer coefficient of a heat exchanger in order to decide on the best course of action. “You specify the condition, you see the effect on the target,” Arroyo said.

A clear, simple central navigation cockpit in PI Vision allows Covestro users to access system data in different ways depending on their needs. Users can choose “Asset View”, which allows quick access to specific data and KPIs by types of equipment, or “Hierarchy View,” which organizes asset data by plant and location.

“Before ProDAVis, our experts had virtually hundreds of island solutions for data analysis,” said Arroyo. “Our solution was to provide them with a set of seamlessly integrated tools, both self-service and machine learning, where they can learn models, analyze process behaviors, and share their insights with other experts.”

For more information about Covestro and the PI System, watch the full presentation [here](#).

PARTNERS:
NECI & Tibco



By exploiting the PI System, we have managed to create a scalable data analysis platform that allows our process experts to visualize and analyze process data in a standardized and efficient fashion.”

— Jane Arnold,
Head of Global Process
Control Technology,
Covestro

Arroyo, Esteban and Frenzel, Philipp. “Process Data Analysis and Visualization at Covestro: The ProDAVis Digitalization Initiative” <https://www.osisoft.com/presentations/process-data-analysis-and-visualization-at-covestro--the-prodavis-digitalization-initiative/>