

Digitalization in packaging: How WestRock built a data foundation on Asset Framework

INDUSTRY

PULP & PAPER

CHALLENGE

Analyzing operational data was tedious and siloed, and it was difficult to make rapid decisions.

SOLUTION

A consistent Asset Framework data foundation across mills with all tags mapped into a single analytics platform.

BENEFIT

Moved away from Excel analysis by standardizing data structure and dashboards, saving over 500 hours per month, per facility.

WestRock's paper mills are scattered all across the globe and are continually producing paper and packaging goods for businesses and consumers alike. While paper and packaging are the primary output, each of those mills produce a whole lot of something else: operational data. WestRock continually collects that data to optimize production. But analyzing the data proved to be difficult. Teams were mired in hours' worth of spreadsheets, delaying important insights and subsequent decisions. "Today at WestRock, we have tons and tons of data—and it's really difficult for any one person to get all the information they need out of it in a timely fashion," said Andre Perez, IT product manager at WestRock during the 2020 PI World online conference.

WestRock knew that unlocking rapid insights from operational data would enable them to support facilities, reduce variability and energy consumption, and—ultimately—grow the company's profits. But before they could run analytics and leverage predictive AI and ML models, they needed a solid data foundation. That foundation was built on the PI System™ and Asset Framework (AF).

A three-phased approach

Moving away from spreadsheets and tedious analysis and into the land of analytics and predictive models required a three-phased approach: foundation, visualization, and analytics.

The team started with 30 paper mills located in North and South America. While WestRock had used the PI System since 2014, time and resource limitations prevented progress with AF, the contextualization layer of the PI System. In 2019, WestRock kicked off a plan to create an enterprise-wide AF structure that would serve as the foundation for standardized data collection across mills. "We definitely focus heavily on Asset Framework," Perez noted.

Asset Framework for all!

Initially, the team planned to visit the mills and gather feedback before performing the AF development. However, they quickly realized they needed facility expertise. In an effort to facilitate team

participation while flattening the learning curve, they turned the entire AF structure into a spreadsheet, including elements, attributes, PI Tag names, and descriptions. Team members used the spreadsheets to offer input and Perez's team built a macro to publish the spreadsheet into AF. In just a single quarter they created the databases in AF, creating a consistent data structure across mills.

The visual effect

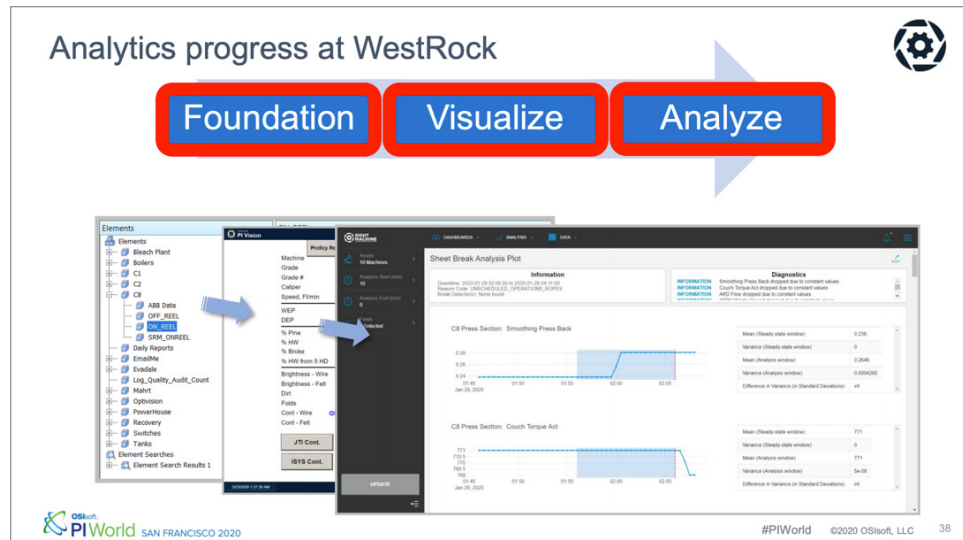
After laying their AF foundation, Perez's team focused on visualization using PI Vision. Working with engineers and other team members, they built analytics and dashboards to view performance data. This type of analysis in Excel took hours, but the combination of AF and PI Vision allowed team members to read, trend, and visualize live data all in one dashboard. These dashboards are also easily replicated across mills.

WestRock quickly discovered issues with the amount of chemicals being used in the demineralizer plants. They created

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Asset Framework is the tool that we use to attach metadata and give more context to all those PI Tags that we have in the [PI Data] Archive.”

— Andre Perez,
IT project manager
at WestRock



Sheet Break tool performs variance analysis on a 10-minute interval just before a recorded sheet break, revealing possible cause of break.

dilution and washing performance KPIs for the brown stock washers and automated the reason codes for changing blades on paper coaters. They built overlay screens to compare performance across similar assets, such as when the steaming and blow valves open on each cook. One screen showed a slight variance in one of the cooks. The team identified a pressure issue and took action. “Applications are endless with Asset Framework,” Perez said.

Analytics anywhere

Then it was time to perform analytics on PI System data. WestRock partnered with Sight Machine to run analytics and AI and ML models. The company sent process data to Sight Machine via AF through AWS along with other mill data, allowing WestRock to view production and quality data in conjunction with PI System data. In just minutes, the team analyzed four months of data on a pump and noticed irregularities that indicated it was starting to fail. Using AF and notifications built

around sheet breaks, they linked the PI Vision display to a Sight Machine analytic. The analytic looks at all tags across the paper machine the moment a sheet break occurs, as well as the time period beforehand, and performs variance analysis. Users can see which tags varied the most within the time period to establish the root cause.

Thanks to the data foundation that was laid in PI System and PI AF, WestRock is moving away from slow and repetitive Excel analysis and using AI and ML to make better, faster decisions. Throughout the process they’ve established data governance guidelines, further standardizing all operational data. Now, analysis is faster and easier than ever, saving over 500 manhours per month, per facility.

For more information about Westrock and the PI System, watch the full presentation here.

Perez, Andre. “PI Asset Framework Drives Mill Analytics at WestRock.” <<https://www.osisoft.com/presentations/accelerating-the-time-to-actionable-insights-with-mill-analytics-at-westrock/>>