



CUSTOMER CASE STUDY

The International Group turns production waste into big profits

Company name - IGI and Lityx
Industry - Chemicals

Goals

- Use AI-powered analytics on real-time, historical and lab data in the cloud to improve wax yields
- Give operators real-time suggestions to increase plant performance and reduce waste
- Replace a proprietary software with a more scalable and efficient solution

Challenges

- Operator behavior varied widely, leading to different results on each shift
- The existing solution could not offer proactive suggestions for changes that could optimize performance

Solutions

- AVEVA Data Hub
- AVEVA™ PI System™

Results

- IGI reduced crude waste by 49% and eliminated 20 hours of off-specification processing every two weeks
- Higher yields generated \$10M in profit over a single year
- The project resulted in an initial 67x ROI, with cumulative returns over time

When material costs rise sharply and erode a business' profit margins, there's really only one solution. Make more product with the same resources. This deceptively simple answer, however, requires a deep understanding of an enterprise's entire value chain. To make more product without more materials, you have to identify the opportunities you're missing. Where are you losing product or production time? What could be more efficient? What's going well, and how can you replicate it?

The International Group, Inc. (IGI) is a privately owned wax producer facing many of the same challenges businesses across the chemicals industry experience. Material costs are rising, the markets it serves are volatile, and staying competitive means continuously exploring ways to improve yields. When the company began a project to collect and analyze its data, it learned it was wasting eight to ten percent of its wax with each production cycle. Increasing yields and improving the circularity of its materials meant finding a way to turn some of that waste into sellable product. Armed with years of production data, IGI turned to AI analytics provider Lityx to apply a solution to analyze its rich dataset and identify how its operators could consistently reduce production waste and operate more efficiently.

“We were able to reduce the wax left over after processing by 50%.” “Instead of throwing away 8% of our production, we were able to sell part of it and reduce waste to only 5.2% in 2021.”

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Bill Sandblom

CIO, The International Group, Inc.

From candles to car tires

You can find wax in surprising places. You might guess that it's used for candles, but did you know that producing a car tire requires almost a pound of wax to prevent the rubber from cracking? You'll also find it in packaging, where it's used to make paper products waterproof, or in pharmaceuticals as a coating for pills. IGI ships almost a billion pounds of wax each year, and the variety of industries that rely on its products means it has to stay agile to meet shifting market demands.

IGI has nine plants in the United States, and transports raw materials all the way from the oil fields to a refinery in Salt Lake City before sending them on to a plant south of Buffalo, NY. The company generates an eye-watering amount of data. It collects data points from rail lines, fuel tanks, an operational excellence center, and AVEVA PI System into a single data warehouse managed with AVEVA Data Hub.

A data warehouse in the cloud

In 2009, IGI adopted AVEVA PI System to gather production data, and quickly standardized the solution across its plants. As a company well on its way to digital maturity, IGI understood how aggregating and visualizing its data could help it identify opportunities for improvement. A few years later, it combined AVEVA PI System data with information from systems across the enterprise. Once completed, the data integration gave IGI an overhead view of its entire value chain. The company initially used Microsoft Power BI to perform basic analytics, but the process was slow, and the findings were incomplete. By analyzing operations data, IGI could see what was happening on each shift, but couldn't predict what might happen in the next shift, or which production settings led to positive production output. While Power BI allowed engineers to visualize data trends, it couldn't model an ideal production cycle or prescribe operator actions. The company's engineers could isolate any of the over 1500 settings and graph the results, but they needed the help of AI to stack those points of data on top of one another and correlate them with output.

IGI first tried to build its own data analysis application before turning to an off-the-shelf option. Because the company was ahead of its competitors on the digital maturity curve, it didn't have many examples to emulate. Conversations with Microsoft, Oracle, and IBM suggested a custom project that would cost over \$1M and might not be flexible enough to adapt to changes in production processes. IGI managed to build a solution with in-house capabilities, but it was inflexible and inefficient. It was also difficult to share data with all the necessary stakeholders.

Several AI providers promised solutions to turn IGI's production data into profit but weren't able to generate useful insights from the rich data repository.

Luckily, Bill Sandblom, the CIO of IGI caught a demonstration from an AI provider in a virtual trade show. The vendor, Lityx, offered exactly the solution IGI needed—AI capable of analyzing thousands of data points at once to identify where a process was losing efficiency, where it was working well, and where to find opportunities for improvement. Within hours of starting a proof-of-concept trial, Lityx was already offering actionable suggestions based on the information stored in IGI’s data warehouse. The next stage of the project added AVEVA Data Hub, a cloud-native data management solution that solved the challenges of sharing real-time data with partners outside the company. With AVEVA Data Hub, IGI and Lityx share the same source of information in a secure cloud environment, rather than trading already-obsolete digital files.

The most valuable data IGI generates comes from the vacuum tower, where machines separate wax into three grades. From there, it goes through a deoiler to remove the oil, and then the product runs through filters to become finished wax. The Lityx AI solution analyzes both real-time and historical data from these processes and identifies the best operating conditions for the plant so IGI’s operators can replicate them. What were the operators doing on the best shift? What conditions led to better yields? With this information, the AI solution generates a model of what the plant’s “best day” might look like, and IGI creates an operating plan based on ideal plant conditions. The Lityx analytics solution offers prescriptions for settings or operator behavior, and IGI tracks actual performance to verify that the prescriptions produce the desired results, and operators follow them. When operators deviate from the suggestions, the solution alerts them to the setting changes that will get them back on track.

“When we pointed our toolset at the data from AVEVA PI System, we were initially blown away and giddy. We were saying, ‘Is this real?’”

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Gary Robinson
COO, Lityx, LLC

More wax, more profit

The return on investment was immediate. IGI’s science-based chemicals process generated data that led to predictable, replicable results. When Lityx pointed its AI analytics solution at the data in AVEVA Data Hub, the AI correlated over 1500 individual settings with plant performance, making it easy to identify optimal operating conditions and replicate them.

The Lityx solution is simple to use. It doesn’t require data scientists or AI specialists, and IGI can generate prescriptive suggestions with minimal data manipulation or cleanup. The Lityx solution also improves IGI’s operational consistency, as operators in different locations all work from the same set of data and follow the same prescriptive advice.

By 2021, IGI reduced waste in its crude tower by 50%. In 2018, before IGI added AI analytics, it was normal to lose 8.5% of the product to waste. Now that number is usually around 3% and still dropping, generating thousands of additional pounds of sellable wax. These increased yields generated an additional \$10M profit in 2022, and IGI estimates the project has increased the company’s profitability by as much as 67x so far. The company also wastes less time with the new solution in place. In 2020, IGI’s operators averaged 33 hours of downtime every two weeks. Now, that average is 12 hours, representing an additional 20 processing hours every two weeks.

“We started the Lighthouse program with AVEVA, and with AVEVA Data Hub, we did the same work that took us eight months in six weeks.”

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Bill Sandblom
CIO, The International Group, Inc.



IGI and Lityx continue to refine the data sharing solution, and plan to expand it to other areas of the business. By constructing a digital twin, IGI hopes to test operational changes on simulated machines and model the results before changing the actual process. The capabilities of the Lityx AI are growing as well. Now, instead of simply identifying and replicating ideal conditions, the tools suggest improvements that IGI's operators haven't even considered yet. Instead of stopping at the "best day" of plant production, IGI is looking for ways to create yields it has never actually experienced before.

The circular economy created by reusing and recycling material also lowers IGI's carbon footprint. More efficient production cycles require less energy consumption to yield the same amount of wax. Asset lifecycles are longer too, as operators and maintenance crews identify decreasing asset performance before equipment fails or production stops.

The solution has been so successful for IGI that Lityx is reevaluating its company strategy to explore an entirely new market opportunity in manufacturing. The company is currently in talks with other chemicals, mining, and manufacturing companies to bring its solution to industrial operations in a variety of industries.

Want to learn more about AVEVA Data Hub?
Check out our [website](#) for additional information and resources.