The Magic of Advanced Analytics for Industrial Manufacturing Processes

Most of you have read or heard the story of Aladdin. All he had to do was rub a magical lamp, and a genie would appear granting him three wishes. The genie, a magical being, had this power. As people involved in industrial manufacturing processes, what would be your three production wishes? Wouldn't it be great if you had your own genie to grant you these wishes to make your job easier and better?

Well, there might not be a magical lamp or a genie, but there surely is magic in using advanced analytics for industrial manufacturing processes to grant you your production wishes.

Advanced Analytics in a Nutshell

Process manufacturing plants have been gathering sensor generated time-series data for many years, but this data has not been fully utilized to gain insights into production. For important situations, data scientists are called in to build models to make sense out of the data, so process experts could solve production problems. This approach is time-consuming and expensive. Now data analytics is being conducted in a new way through advanced analytics and more specifically through self-service analytics. Magic!

Process experts can use this manufacturing software to analyze plant data to make analytics-driven decisions and to help control business outcomes. Without a data science background, they can use this tool to easily fulfill their manufacturing wishes by answering common production questions such as:

- How is production process performing?
- How often has a certain problem occurred?
- What is the root cause of the issue?
- Can deviations from good behavior be monitored?

- What is likely to happen next?
- Can the next time maintenance is needed be predicted?

Additionally, contextual information residing in various sources (maintenance data, operator logs, etc.) can be used to enrich the time-series data and to help experts better understand operational performances. The contextual information can be analyzed separately to get deeper insights into processes and assets. Lastly, analytics-driven dashboards can be created with live data, so that each stakeholder from "the control room to the board room" can control business outcomes.

With self-service analytics, process and asset experts can now:

- Solve previously unanswered questions, such as identifying the root causes of performance drops.
- Test and verify hypotheses to be addressed or ruled out.
- Find new ways to improve performance through data insights.
- Use contextual information from 3rd party business applications to gain additional awareness into operational performance.
- Use actionable dashboards to monitor operational performance in real-time.

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Travel back in time and discover how engineers like you could have benefitted from using self-service analytics in their previous roles.

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Analyze Data to Find Root Causes Fast

When there is a process problem, process experts need answers fast. With high-speed search engines, advanced filter options, and pattern recognition technology, advanced analytics tools can be used to gain data-driven insights on process and asset performance. Advanced search algorithms, combined with pattern recognition, proactively provide recommendations to process experts to uncover previously hidden correlations and identify causes of process issues. Another benefit: process experts can speed up root cause analysis and identify new areas for optimization. Manufacturing magic is provided through descriptive, discovery, and diagnostic analytics.

Monitor Manufacturing Processes to Safeguard Operational Behavior

Events that occur once will likely occur again. An advanced analytics tool can help process experts prevent repeating production issues by monitoring live data 24/7. Golden fingerprints can be easily created based on historical data. In the event of deviations from these fingerprints, automatic notifications can be sent to the process experts. Messages can be customized to prescribe the best response given the circumstances, allowing process experts to take appropriate action before the production faces issues. Moreover, process experts can automatically annotate and label events, so lessons from the past can be captured and shared. Thus, abnormal situations can be avoided, and good behavior can be monitored.

Predict Future Performance

Predicting process behavior with advanced analytics does not require a genie nor a data scientist. Process experts can use its magic without having a data science background. They

can immediately apply their expertise to solve a potential production issue before it occurs. Process evolution can be used to provide early warnings and can also be extended to the level of predictive maintenance. With the captured events and prescriptions from the experts, the organization can receive appropriate instructions on what action needs to be taken or when to schedule the work. Advanced analytics allows for predictive analytics and event base prediction and logging, so process experts can inform maintenance to plan work orders.

Process Experts Get Three Additional Wishes with Self-Service Analytics

With advanced analytics, process experts get three wishes – just like Aladdin. However, with self-service analytics, process experts don't get just 3 wishes, they get 6! They can use the magic of self-service analytics to analyze, monitor, and predict and additionally also contextualize, visualize, and collaborate globally – doubling the industrial manufacturing analytics magic.

Contextualize Information to Make Faster and Better Decisions

All kinds of events may impact operational performance. Capturing and combining critical events with advanced analytics can shed new light on production processes. Contextualization helps process experts illuminate time-series data with production information – to get a clearer view on operational behavior. Contextual information may reside in various data silos such as LIMS, MMS or OEE systems. Through self-service analytics, this information can be leveraged for data driven decisions in the control room and can be the starting point for continuously improving operational excellence. Contextualization also unlocks data silos, allowing for personnel at all levels of the operation to share and have the necessary process information.

Visualize Production to Provide Analytics-Driven Storytelling

Just like the genie in Aladdin's story is all seeing and all knowing, process experts can be too with self-service analytics. Self-service analytics allows experts to create their own production cockpits. Stakeholders from "the control room to the boardroom" can have actionable production cockpits complete with dashboard, analytics suite, and agile communications facilities. They can create and share a complete and live overview of the statuses and performances of the production process allowing them to make educated decisions.

Collaborate Across your Organization

With self-service analytics, experts can easily work together to solve process performance issues, share their work, and make use of findings at other sites. Search settings and filters can be saved and shared with other process experts. Because it is web-based, users can do analyses anywhere in the world and react to automatically provided notifications. The analytics-driven operational dashboards streamline the flow of information between shifts teams. As a result, experts can have live production views and historical analyses from the remotest factory and can share this information to experts located anywhere in the world, giving all personnel the power to make informed decisions rapidly.

Process Experts – the Genies in the Lamp

Advanced analytics allows process experts to be the "Genie in the Lamp" for industrial manufacturing processes allowing them to analyze, monitor, and predict.

However, companies that choose a self-service analytics tool get double the magic – allowing them to also contextualize and visualize production processes and collaborate

with their teams globally. By doing so, experts can drive operational performance and increase resource efficiency and company-wide collaboration. They get increased competitiveness and profitability. **Process experts ain't never had a friend like that!**