CUSTOMER CASE STUDY

AVEVA helps Schneider Electric's Lexington Smart Factory create a blueprint in efficiency

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Industry - Manufacturing

Goals

- Boost plant efficiency by introducing IIoT technologies that reduce downtime, while modernizing the control, monitoring, and management processes of the plant
- Unlock data silos and better mobilize staff with increased plant-wide visualization, via real-time process data that is easily accessible and sharable

Challenges

- Lack of data visualization, accurate information and detailed analytics, hindering the teams' ability to make timely decisions to optimize process efficiencies
- Paper-based work order management and processes impacting decision making, response time and contributing to costly system downtime

Results

- Enhanced digitization and site-wide monitoring with AVEVA™ Edge has helped Lexington mobilize and empower their workforce while enabling faster, smarter decision making, resulting in a reduction of manual paperwork of 90%
- Leveraging AVEVA's Discrete Lean Management software the site has driven improvements in labor productivity, with AVEVA™ Insight's cloud-based insights helping further reduce unplanned downtime by nearly 6%

Legacy manufacturing plant becomes one of the world's most advanced smart factories

Schneider Electric's 62-year old factory in Lexington, Kentucky, has recently digitized plant-wide operations with the brownfield site now one of the group's leading Smart Factory showcases, with plans already underway to replicate the model at additional sites around the world. Using Schneider Electric and AVEVA's integrated solutions, the plant's digital innovation strategy leverages IIoT connectivity and both edge and predictive analytics to drive new levels of process efficiency while helping to advance sustainability ambitions.

"We feel like we are only scratching the surface on the benefits that can accrue as a result of these new digitization tools. We are exploring areas that we've never had the opportunity to look at before. This opens the door to new ways of thinking about our facility and will reveal new ways to improve productivity and efficiency, not just in Lexington but in other plants around the world."

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Mike Labhart
Senior Manager, GSC North America Smart Factory Innovation
Schneider Electric

AVEVA is a key partner within Schneider Electric's Smart Supply Chain Program, focused on transforming its global network of manufacturing sites through the digitization of work information and lean management practices.

The Lexington facility is a showcase within this program, which focuses on harnessing emerging technologies to drive energy efficiency and best practice around the world. In recognition of leadership in driving the adoption of such innovations, two of Schneider Electric's additional showcase sites, flagship Batam Indonesia and Le Vaudreuil, France, have both received World Economic Forum Advanced Lighthouse status in 2019 and 2018 respectively. The Kentucky factory is the first U.S site to receive such honours with additional recognition for its end-to-end digitization achievements, representing a further milestone in Schneider Electric's Smart Supply Chain Program.

The Lexington site integrates Schneider Electric's IIoT based EcoStruxure solutions and AVEVA's cloud and edge software, leveraging the latest digital technologies including augmented reality, remote monitoring and predictive maintenance. The result is a considerable improvement in process efficiency, cost savings, and an empowered workforce driving superior agility and resiliency in operations. As well as being a model site for Schneider Electric's Smart Supply Chain transformation around the world.

Supply chain innovation at its core

Employing nearly 500 people, the 500,000 square foot Lexington facility is focused on the production of high-quality load centres and safety switches predominantly for commercial and industrial power systems, with an output of over 16,500 finished goods per day. The site has long embraced modernization and digital transformation as critical to its continued success, having been utilized as a testbed for innovations and emerging technologies over the past decade.

Today the factory is smart and highly integrated, with digital technologies empowering operators with real-time visibility into operations and maintenance, while digitizing paper-based processes, reducing downtime and significantly enhancing efficiencies across the site. With manufacturing organizations around the world continuing to adapt to economic and supply chain fluctuations arising from the pandemic, such insight and agility in operations is crucial in ensuring ongoing resilience and viability, as well as helping reduce carbon footprints and decelerate climate change.

AVEVA's Discrete Lean Management software solution provides a set of digital tools to enable manufacturing sites such as Lexington to rapidly adopt proven industry standard Lean practices to reduce production losses, continuously improve discrete production line effectiveness, driving newfound levels of agility and performance while helping improve overall efficiency.

Realizing Lexington's Smart Factory transformation ambitions

The Lexington facility is vertically integrated, utilizing a complex system of automatic conveyance for material from fabrication groups to their intended assembly cells. At any given time, there are over 6,000 parts being transported automatically from the fabrication process, through painting processes and onto the final assembly line. With such a highly automated process the majority of products do not touch human hands, from their raw state of coiled steel through to the final assembly process. Hence, Work-In-Process (WIP) quantities are difficult to obtain and monitor and lack of real-time knowledge can lead to regular outages and shutdowns.

Schneider Electric is the leading industrial manufacturer of energy management solutions for medium voltage, low voltage, secure power, and automation systems that optimize energy management and automation in homes, buildings, data centers, infrastructure and industries. Leaders in energy management innovation, the company was recently recognized as the most sustainable company in the world (2021 Corporate Knight's Global 100 Most Sustainable Corporations).

Across the individual cells of the shop floor, where teams are interacting with industrial machines and robots, safety also remains a top priority for Schneider Electric.

AVEVA's Discrete Lean Management solution offered Lexington an opportunity to address these challenges providing mobile notifications to the production floor staff helping optimize machine performance, while driving enhanced efficiency and safety. Both work instruction tools and quality database information are integrated into a unified cloud-based application collecting, storing, and visualizing process and performance data for faster, smarter decision making.

Timely and accurate edge control

The entire Lexington factory floor is integrated with monitoring technologies that trigger alarms when a production anomaly occurs. With the power of AVEVA Edge, critical WIP data is pulled from Schneider Electric's PLCs - of which there are over 300 across the plant - and streamed to the AVEVA Insight operations and asset management platform in the cloud for dissemination across the organization. Previously, such production data was manually stored on spreadsheets, not accessible to all staff and certainly not captured in real-time. AVEVA Edge now distributes critical data to key personnel allowing them to monitor operations and receive notifications of process anomalies and alarm notifications on their mobiles, as they happen, whether they are on-site or at home. AVEVA's Edge control model currently includes almost 200 process critical variables to help further enhance site-wide efficiency and decision making.

Cloud-based insights driving more timely decision making

The solid base of connected devices and advanced edge control helped the Lexington team prepare the foundations for complete end-to-end digitization, with the addition of cloud-based capabilities to combine, visualize and share data. The introduction of AVEVA Insight helped unlock siloed process data, consolidating digital dashboards of real-time and historical information, for personnel to share and action across mobile devices. Standardized KPI reports and mobile push notifications further empowering supervisors to make timely adjustments anywhere, on any device, to ensure optimal efficiency and recognize potential material outages before they occur.

The addition of AVEVA's software tools has helped modernize Lexington's processes and reduce cumbersome paperwork, through digitization and centralized real-time dashboards with predictive analytic capabilities helping teams optimize valuable process variations in advance. The result being empowered connected workers, a reduction in manual paperwork of 90%, a reduction in critical process system downtime by 5% - with an anticipated return on investment of less than 6 months.

"We are excited to be continuing to set new standards in smart factory excellence with AVEVA, leveraging our collective expertise to redefine efficiency, while empowering our teams and accelerating our sustainability ambitions.

The Lexington site is a showcase of our IIoT integrated digital innovations, not only earning us further WEF Lighthouse recognition, but providing us with a blueprint for manufacturing modernization best practice in our sites around the world."

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Anthony Loy
Smart Supply Chain Program Director,
Schneider Electric

Fast deployment of AVEVA's integrated solution

AVEVA Insight was deployed by local onsite resources, initially to visualize inventory data starting with just 6 material count quantities. The cloud-based solution is both simple to deploy and extremely simple to use, with templated report formats ensuring teams were able to implement consolidated dashboards within mere minutes of training. Thereby alleviating the former transfer of knowledge issues prevalent throughout the plant, particularly with so many legacy assets and associated maintenance protocols. The new digital tools also ensured the onboarding and training of new employees was extremely timely and standardized.

The project moved extremely swiftly, with the Lexington team integrating AVEVA Edge to help streamline the AVEVA Insight content within a matter of weeks. Currently the Lexington site has over 1,200 critical data points being streamed from the factory floor to AVEVA Insight with over 40 employees relying on the software day-to-day.

The differentiator in the timely deployment and integration being the simplicity of the AVEVA solutions. Invariably on-premise traditional Supervisory Control and Data Acquisition (SCADA) systems are complex to setup and maintain, requiring tribal knowledge in the creation of visualization content as well as the delivery of the data. The pre-defined templates available with AVEVA Insight simplify and standardize report creation within just a few clicks. Simple dashboard URLs and mobile application integration further streamlining and scaling the process.

Furthermore, supervisors are able to set personal alarm limits on troublesome WIP levels and react before actual outages occurred. Thereby shifting manpower to different areas to heighten productivity, running alternative products, or even taking scheduled breaks during the outage at optimal times.

Harnessing innovation to accelerate smart factory transformation

The Lexington site is part of Schneider Electric's Smart Factory Program has to date launched 11 Smart Factories in the US, Mexico, China, France, Bulgaria India, Indonesia, and the Philippines. These factories are core to the company's Tailored Sustainable Connected (TSC) 4.0 supply chain digital transformation, where Schneider Electric leverages digitalization through its EcoStruxure platform and architecture across its supply chain operations. The Lexington site represents the second Smart Factory collaboration between AVEVA and Schneider Electric following the successful Smart Factory transformation in Batam, Indonesia.

Following the deployment of the new integrated digital solution at Lexington, comprising Schneider Electric, AVEVA, and third-party technologies identified the following benefits across the site:

- Schneider Electric's EcoStruxure solution is being utilized for the site's digital energy management strategy, driving 26% savings in energy spend for the North American region and $6M in energy savings over the first few years
- AVEVA's integrated cloud and edge solution has helped empower the Lexington site's workforce, with digitized processes enhancing production line effectiveness, whilst enabling faster, smarter decision making
- Enhanced digitization and site-wide monitoring with AVEVA Edge has reduced manual paperwork by 90%
- AVEVA's Discrete Lean Management software has driven improvements in labor productivity, with AVEVA Insight's cloud-based insights helping further reduce unplanned downtime by nearly 6%
- EcoStruxure Augmented Operator has driven a 20% reduction in Mean Time To Repair (MTTR) on critical equipment
- Optimizing the plant with EcoStruxure Power and Buildings has driven a 26% energy reduction, a 78% CO_2 reduction in conjunction with renewable energy credits (RECs), and a 20% water use reduction

Looking ahead

Representing a milestone in Schneider Electric's digital transformation and sustainability efforts, the Lexington site continues to operate day-to-day, also serving as a Smart Factory showcase site for visitors to appreciate how digital innovation can help realize new standards in efficiency while accelerating sustainability outcomes.

As a blueprint in process and energy efficiency, the Lexington facility is helping Schneider Electric and AVEVA standardize manufacturing process performance and digital transformation excellence, with the integrated discrete lean management solution being deployed in more than 90 of Schneider Electric's Smart Factories around the world.

To learn more about AVEVA's discrete lean manufacturing solution, visit:
aveva.com/discrete-lean-management