

CUSTOMER CASE STUDY

Successful manufacturing operations at F&N Dairies rely on AVEVA solutions

F&N Dairies - www.fnthaidairies.com
Industry - Food and beverage

Goals

- Monitor manufacturing processes in real time to improve record-keeping and meet requirements for product quality and ingredient traceability
- Facilitate connectivity of plant operations with industrial automation devices, computers, and laboratory measuring instruments
- Reduce the total cost of ownership by enabling easy upgrades of systems across the enterprise

Challenges

- Plant operators had to manually trace product data in archived, paper-based operations sheets to determine the cause of quality issues, which took a tremendous amount of time

Solution

- AVEVA™ Manufacturing Execution System
- AVEVA™ System Platform
- AVEVA™ Historian

Results

- Reduced product quality traceability time from four hours to only one minute
- The manufacturing facility achieved its return on investment within one year
- The plant achieved “100% First-Time Quality,” a metric that indicates what parts are manufactured correctly the first time without the need for inspection, rework, or replacement

What do two Scotsmen and Ayutthaya, the ancient capital city of Thailand, have in common? The answer: F&N Dairies. F&N Dairies has provided consumers in Southeast Asia with nutritious dairy products for more than 130 years. Named after its Scottish founders, John Fraser and David Neave, F&N Dairies was established in 1883 in Southeast Asia. Since then, it has been a food and beverage giant in the region, producing more than 24 million cases a year.

“F&N Dairies has set very high standards for food safety, production efficiency, and energy usage goals,” said Somchai Khwahan, Production Manager at F&N Dairies. “Our plant adheres to very strict quality control measurements at every step of the manufacturing process, and the Rojana plant relies on the latest manufacturing technologies and solutions to meet these goals and metrics. A critical software solution developed at F&N Dairies Thailand is Process Nexus II.”

The Process Nexus II project brought F&N Dairies significant improvements in operations efficiency, and the project expanded the company’s reporting capabilities throughout the enterprise. F&N Dairies developed its Process Nexus II system with the help of AVEVA Ecosystem Partner Sagitate Co., Ltd. based on AVEVA Manufacturing Execution System solutions.

“Process Nexus II is a process and quality data acquisition system that enables online data to be captured and made ready for the user to review and release online. Based on the extensive capabilities of AVEVA software, the Process Nexus II system enables our production and management teams to monitor and control plant processes in real time.”

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Roongroj Roongruang
Factory Engineering Manager, F&N Dairies

AVEVA Software serves as the foundation for Process Nexus II

As a global leader in Human Machine Interface (HMI), SCADA, and real-time operations management software, AVEVA software solutions enable production and industrial operations to synchronize with business objectives to achieve speed, flexibility, and sustained profitability. AVEVA software delivers significant cost benefits for designing, building, deploying, and maintaining robust applications for manufacturing, and infrastructure operations.

The AVEVA Manufacturing Execution System offers inventory, production, and quality operations management and performance monitoring, and it gives manufacturers a model-driven, process-centric approach to the digital transformation of work and continuous improvement in multi-site manufacturing operations. With AVEVA Manufacturing Execution Systems serving as the foundation for Process Nexus II, F&N Dairies optimized its entire enterprise, including manufacturing execution, enterprise integration, batch, quality, operations, and performance management.

“Sagitate provided F&N Dairies with a wide range of AVEVA software solutions to achieve its business objectives. We implemented AVEVA Manufacturing Execution System, AVEVA System Platform, and AVEVA Historian as part of the Process Nexus II project according to F&N Dairies’ functional requirements, such as quality control, tracking, and traceability.”

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Paruhut Chanpahol
Sales Manager, Sagitate (Thailand) Co., Ltd

Process automation and reporting are key to profitability

Process Nexus II allows F&N Dairies to monitor and record net content control, which measures product net weight and product loss during the manufacturing process. The captured net weight is plotted to show its trend, and from there, the operators at F&N Dairies can calculate overfill in real time and react immediately to address overfill issues to minimize loss.

With AVEVA™ InTouch HMI, staff quickly and easily sees what is happening along the production lines. AVEVA InTouch HMI offers an open and extensive supervisory HMI and SCADA solution that allows F&N Dairies to quickly create standardized, reusable visualization applications and easily deploy them across its entire enterprise. AVEVA InTouch HMI provides engineering simplicity, operational agility, real-time performance, lower operating costs, reduced risk, and increased security.

F&N Dairies also uses statistical process control (SPC) software from AVEVA, which offers real-time communication to shop floor systems. Statistical process control helps to quickly reduce variations, lower costs of manufacturing and increase productivity at F&N Dairies. Performing both online and historical process control, AVEVA's SPC software supports quality monitoring and alarm management to view process "health" over any period.

"Imagine manufacturing three million cans per day. How do you control each can's net weight to ensure it is properly filled with little to no overfill? This was an issue that our team faced daily, and eventually, the paper-based record-keeping processes were not able to keep up with our rapid production, so we developed Process Nexus II to capture this information."

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Somchai Khwahan

Production Manager, F&N Dairies

Process Nexus II allows early dispatch of finished products

Process Nexus II takes care of the batching processes at its Rojana Plant with AVEVA™ Batch Management. AVEVA Batch Management enables plant technicians to effectively manage batch operations, perform recipe modeling, and develop batch execution automation. In addition, AVEVA Batch Management records material genealogy and batch history, as well as provides stringent security. These metrics can be captured and presented in web-based reports for the plant and executive management teams to review. F&N Dairies can now successfully meet stringent requirements for product quality and ingredient traceability.

As an independent control system for batch management, plant operators can quickly deploy and run revised or new product recipes without control system changes, reducing the time to market and recipe validation efforts in regulated industries. AVEVA Batch Management helps F&N Dairies achieve maximized process equipment utilization and return on assets (ROA) through its sophisticated batch control logic. AVEVA designed this batch control logic to allow simultaneous multi-product and multi-stream batch execution on shared equipment.

Quality monitoring, traceability, and reporting challenges at the Rojana plant

F&N is required to keep product quality documentation until the end of the product's shelf life, which is typically two years. Before Process Nexus II, it was easy to make mistakes during the process of reviewing quality assurance parameters since the reports were all handwritten. It was a time-consuming process and a demanding workload.

“There were about 40 reports per day, which included raw material receiving, processing control sheets, filling and packaging, as well as cleaning operation control sheets,” said Watcharapong Boonnam, Quality Assurance Manager at F&N Dairies. “Process Nexus II has helped to solve this problem by reducing the quality traceability process time to only one minute. Without Process Nexus II, it would take us more than four hours to complete one traceability report.”

Reduced product quality traceability time from four hours to one minute

Prior to the Process Nexus II system, when quality parameter deviations were detected, operators had to manually trace the information in the paper-based operations sheets filed in the archive room. This took countless hours of manpower, time, and effort to trace the root cause of the problem.

To resolve the manual input of data, the new software system features AVEVA Historian—a high-performance process historian, capable of electronically storing huge volumes of data generated from F&N Dairies’s facilities. AVEVA Historian easily retrieves and securely delivers information to desktop or mobile devices, enabling the company to analyze processes anywhere at any time.

Historian works in conjunction with AVEVA InTouch HMI to make critical process data capturable and available for troubleshooting and process analysis when necessary.

Connectivity to third-party products and a lower total cost of ownership

F&N Dairies chose AVEVA software solutions for a couple of reasons. Firstly, AVEVA software easily connects with other devices in the plant. With so many processes and equipment types in place at F&N Dairies, the AVEVA solutions provide easy connectivity with the other industrial automation devices, computers, and lab measuring instruments currently at F&N.

“After the Nexus II implementation, it is very convenient to summarize and consolidate the plant data,” said Sitthichai Sribunyapirat, F&N production manager. “We are now able to collect product traceability information for both the upstream and downstream functions of our process in real time.”

Secondly, when evaluating AVEVA, F&N compared it with other software applications, and the total cost of ownership of AVEVA was comparatively lower than its competitors.

“Because AVEVA software is Windows-based, it provides an easy upgrade path,” Roongruang said. “When Microsoft upgrades a version of Windows, or AVEVA issues a software upgrade, the Process Nexus II software is automatically upgraded across all processes and locations.”

Process Nexus II gives F&N Dairies 100% FTQ

With AVEVA Manufacturing Execution System software, F&N Dairies can track its raw materials inventory more efficiently. The solution helps the company to manage, execute, and document production operations information during work order execution. This includes bills of material and equipment set point specifications, inventory tracking, and collecting product genealogy for lots and sub lots, as well as consumed and produced materials.

The plant also achieved “100% First-Time Quality,” which is a metric that indicates what products are manufactured correctly the first time, without the need for inspection, rework, or replacement.

Return on Investment within one year

Using AVEVA Manufacturing Execution System software, F&N Dairies increased its operational efficiencies, reduced production errors, and quality losses, as well as increased product yields. F&N productivity also has risen through rapid inventory turns, reduced production lead times, and faster new product introductions.



Process Nexus II is also responsible for Product Inventory Control. After production is completed, the finished products are typically stored in a warehouse where they await transport. After the implementation of Process Nexus II, products are dispatched early and sent straight to the container vans, ready for transfer to the ports for distribution, bypassing the warehouse altogether.

“With this system, F&N has reduced inventory in our warehouses, created cost savings, and achieved payback from our system investment within one year,” Khwahan said.

The trust of F&N Dairies in the capability of AVEVA Ecosystem Partner Sagitate is evident in its long and deep collaboration

The success of the Process Nexus II system at F&N Dairies was thanks to a small village of experienced engineers at both F&N and Sagitate. F&N has benefitted from a seasoned team of AVEVA consultants, architects, and project managers that are uniquely qualified to provide design engineering and product specialist services. They can address all aspects of supervisory control, operations, and asset management services.

With Process Nexus II, the Rojana plant of F&N Dairies, Thailand, enjoys significant savings in production, logistics, and inventory costs, setting the company up to meet the needs of its business goals now and well into the future.