SIEMENS

Case Study

Major Beverage Manufacturer Breaks Long-held U.S. Traditions

For advanced syrup room automation and significant cost savings

Customer: Global beverage manufacturer.

Challenge: Manufacturer's mission critical U.S. syrup room automation system was mature, posing certain risk to plant productivity as well as cost inefficiencies due to shrinking availability and high cost of parts.

Solution: A seamless, efficiently designed, quickly deployed and fully functioning modern automation system from Siemens that is supportable for the next 30 years.

Results: Considerably lower price than other systems; immediate production start-up without issues; no networking or hardware requiring special IT knowledge; seamless program logic; transparent diagnostics; redundant ring Ethernet network; merging of segmented communication networks into one; reduction of three monitoring systems into one; secure remote access to whole platform; decrease in needed spares; free technical support; repeatable design and systems platform.

A retrospective

The syrup room is the heart of a beverage manufacturer's facility, where operational efficiencies and performance directly impact the success of the downstream supply chain. Changes to syrup room automation are approached and performed with extreme caution. This includes modifications to any component of hardware, software, programming logic, monitoring and diagnostic systems, communication networks and connectivity. When change is needed, beverage manufacturers heavily rely on trusted manufacturers and suppliers for their IT procurement, maintenance, operations and training.

In the United States, the products and systems of one major provider have historically served the hardware and software needs of the beverage manufacturing market. Over time, the large installed base of Rockwell Automation machines and systems created a domino effect in the region. System Integrators and suppliers also cater to the North American market by providing Rockwell or compliant IT. To compete, U.S. systems integrators and aftermarket parts providers also support Rockwell. Service and support systems are largely based on Rockwell technologies, so manufacturers' internal technical resources are fluent in Rockwell hardware and software, and investments in Rockwell spare parts are significant. Sales organizations have built the perception that non-Rockwell solutions are more expensive.

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Combined, these dynamics deterred U.S.-based beverage manufacturers from pursuing automation alternatives, and market dominance was an entry barrier for other automation providers. Until recently.

The best solutions for today's U.S. beverage manufacturers are equal parts IT and ingenuity.

Recognizing that modernization and continuous improvement would remain priorities for beverage manufacturers world-wide, Siemens set out long ago to form inroads with a global, U.S.-based manufacturer.

As relationships and internal awareness of Siemens global capabilities grew, the manufacturer began awarding projects to Siemens. These have included the provision of packaging line systems in greenfield and brownfield plants, inside and outside North America.

Through these highly successful projects, Siemens dispelled longstanding stereotypes that had precluded its expansion into new markets like the United States.

Siemens proved that:
- It can proficiently support and exceed U.S. beverage manufacturer hardware and software requirements.
- A manufacturer's internal technicians can quickly learn and support Siemens systems and equipment.
- The combination of Siemens products, systems, services, technical training and support are more cost efficient and effective than those of its North American competitor.

The customer
A major beverage manufacturer with facilities worldwide had standardized the syrup rooms in its plants in North America. In this region, the manufacturer used Rockwell Automation systems due to the provider's historical presence and modest competition, along with initial low cost, perceived software ease of use, strong service and support, and a large installed customer base.

The Challenge

The beverage manufacturer was operating with a mature automation system in one of its U.S. syrup rooms. The system comprised a programmable logic controller (PLC),

human machine interface (HMI), drive products and communication networks that posed risks and uncertainties to plant productivity. Availability of spare parts was also poor and pricing was high. The system needed to be replaced with modern components that would be supportable long term. In addition to reconciling the need to upgrade its entire platform, the manufacturer also had to decide on a provider. Would it modernize through its existing U.S. automation partner – or choose Siemens?

Technical and operational challenges posed risks in changing providers
Moving from one syrup room automation provider to another exposed the manufacturer to extended downtime during conversion, as well as start-up issues post implementation. Given the manufacturer's extensive requirements, the infrastructure design of the new syrup room automation platform would be extremely complex, and there would be a need for local engineering and hardware support from a new provider due to the plant technicians' lack of familiarity with new systems.

The project would be challenging regardless of provider
Existing automation hardware and communication networks had to be replaced in a minimal timeframe while minimizing risk. All programming code had to be written from scratch to result in one seamless program, and customized code had to be kept to a minimum. Hardwiring in cabinets was to be eliminated to the fullest extent possible. Syrup recipes were to be stored and used in smart panels. Use of diagnostics was expected to reduce complexity, and remote connectivity was required for all networks and hardware. In addition, process reports were to be capable of printing and local electronic storage, and an on-site spare parts inventory, as well as technician training and support were required.

The Solution

In 2014, when the beverage manufacturer was ready to replace its obsolete syrup room control system, Rockwell Automation and Siemens were each invited to submit proposals. The manufacturer's local organization weighed the technology, costs and benefits, and awarded its mission critical project to Siemens. Through the Siemens proposal,

and ultimately its platform design, innovative technologies, manufacturing automation expertise and successful implementation, it was proven again that:

- Siemens can support beverage manufacturer hardware and software needs in North America.
- Siemens products and systems are not more expensive than Rockwell Automation.
- Long-time internal technicians quickly learn Siemens systems and can support its equipment.

Siemens provided all automation and related services, including design, electrical/hardware/software installation, project management, program engineering and support, on-site commissioning support, an on-site spare parts inventory, technician training and no-cost technical support.

> Siemens demonstrated that it could satisfy the manufacturer's syrup room automation requirements, and provide an innovative, quickly implemented platform at a substantial cost savings.

Risk was mitigated throughout the process. Hardware and programming were pre-tested with existing I/O before conversion. Hard wiring between control panels was eliminated, and so was the use of pneumatic block assemblies. Remote connectivity assisted in troubleshooting. On-site maintenance training quickly brought manufacturer technicians up to speed, and in-plant inventory was reduced with a standardized hardware approach to keep spending in check.

Upgrades were performed in each of the syrup room's control panels, the Ethernet communication network and the factory floor networks (FFN). New control panels included the main control panel, motor control panel, solenoid panel, three distributed I/O panels, sucrose receiving panel, common industrial protocol (CIP) panel, and the sucrose pump VFD panel.

The Results

Modernizing its U.S. syrup room automation through a growing technology partnership with Siemens allowed the beverage manufacturer to achieve advanced, cost-efficient, scalable systems to maintain and accelerate growth, support product development and fortify the supply chain in the years to come. Siemens hardware was 40 percent less and the full solution savings was 30 percent more than the solution offered by Rockwell Automation.

The project was completed ahead of schedule, providing the manufacturer and its syrup room technicians with a fully functioning modern automation system that is supportable for the next 30 years. The platform started up with no issues, allowing production to commence immediately.

Designed to facilitate easy conversion, ease of use and future upgrades

There is no networking or PC/server-based hardware that requires special IT knowledge. The platform provides

seamless program logic, a redundant ring Ethernet communication network with transparent diagnostics, and micro memory back up. The segmented factory floor Ethernet network is combined into one flat communication network. The plant's previous three monitoring systems were reduced to one visible system that is accessible in three locations, and technicians have secure remote access to the complete automation platform. The design of the system is repeatable for fast future upgrades.

Built on a dynamic, future-proof foundation of scalable technologies

The platform is designed and engineered to improve, monitor and quickly diagnose manufacturing production processes:

- Deployed IT includes Siemens SIMATIC technologies and CPU, along with globally recognized SITOP power supplies, and fully integrated software, networking and Ethernet connectivity.
- The SIMATIC ET 200SP delivers new generation distributed I/O that is simple to use, smaller in size and stronger in performance, engineered to scale the manufacturer's automation, control production and maintenance costs, and minimize downtime.
- The sophisticated SIMATIC HMI TP2200 Comfort Panel equips the manufacturer with a high-resolution widescreen touch and key control panel that is backed by high-end functionality for demanding HMI tasks.

SIMATIC technologies integrate with Siemens Totally Integrated Automation components, including the TIA Portal, which provides the engineering framework for all planning, machine and process procedures. The SIMATIC WinCC Smart Server permits remote control and monitoring of HMI systems via Ethernet, the Intranet and the Internet. WinCC software provides future-proof engineering software for programming all HMI devices within the TIA Portal.

The complete platform is networked through a collection of Siemens SCALANCE Ethernet switches supporting extensive automation functions and high-speed redundancy, along with Cat 5 and Cat 6 Ethernet cables for error-free commissioning, and FastConnect Ethernet connectors for quick on-site installations and changes.

> From planning to implementation, training and start-up production, close collaboration between Siemens and the manufacturer resulted in a highly successful and cost-efficient conversion.

Learn more about the products and systems driving the manufacturer's U.S. syrup room

From Siemens Digital Factory (DF) Division:

- **SIMATIC ET 200SP** – New generation distributed I/O that's simple to use, smaller in size, stronger in performance
- **SIMATIC HMI TP2200 Comfort Panel** – From a sophisticated line of Touch and Key Panels with high-end functionality
- **SIMATIC CPU S7 1540** – S7 1500 CPUs deliver the ultimate plus in productivity, efficiency and automation
- **Microbox PC SIMATIC IPC427D** – Top performance for demanding control, data collection and communication tasks
- **SITOP Power Supplies** – Globally recognized for high reliability for critical network functions
- **SINAMICS G120C VFDs** – Vector drives offering highly integrated safety, energy savings and network connectivity
- **SINEMA Server Software** – Highly integrated network monitoring and transparent diagnostics for industrial applications
- **SIMATIC WinCC Smart Server** – Permits remote control and monitoring of HMI systems via Ethernet, Intranet, Internet
- **TIA Portal** – Unlocks the full potential of Totally Integrated Automation
- **WinCC V13** – Future-proof engineering software to program all HMI devices in the TIA Portal

From Siemens Process Industries and Drives Division:

- **SCALANCE XM408-8C Ethernet Switch** – Versatile switch in a compact design for any application
- **SCALANCE X208 Ethernet Switch** – High-speed redundancy in ring with electrical and optical paths
- **SCALANCE X308 Ethernet Switch** – Extensive IT functions for high-performance plant networks
- **Siemens Cat 5 and Cat 6 Ethernet Cable** – Enables easy, interference-proof commissioning
- **Siemens FastConnect Ethernet Connectors** – For quick, error-free onsite installation and changes

Non-Siemens Products

- **SMC Pneumatic Control Valve Banks with PROFINET Control Head**