



SIEMENS

Case Study

Confections manufacturer takes efficiency to new levels with a single process controller and plant-wide data transparency.

The Customer:

A leading manufacturer of confections

The Challenge:

This manufacturer needed to upgrade its plant operating systems and technologies to increase process efficiency, support new growth, enable data transparency in the plant and other business systems, and allow local maintenance, implementation and support.

The Solution:

Through collaboration with Siemens, the manufacturer chose to implement an open, integrated and data-driven technology platform to ensure quality, cost control and on-time delivery, and allow engineers and operators to leverage the power of new technologies for years to come. This was achieved with a single process controller to centralize control of production lines and processes, and a client/server SCADA solution to provide access to and transfer of data.

Finding lucrative sweet spots in the manufacturing process

Downstream supply chains that rely on confections manufacturers are unforgiving of delays and substandard goods. Confections manufacturers face continual pressure to boost productivity, improve quality, cut costs and pick up their pace to market. These challenges are about survival, and collectively, point to better process efficiencies.

Contrary to common perceptions, a complete plant makeover is not required to affect across-the-board improvements. For one manufacturer, combining modern and centralized efficiencies with parts of an existing platform is producing powerful results.

The Customer

An established manufacturer of confections approached Siemens for consultation on how best to upgrade the technology platform driving its production lines. It was a critical time for the manufacturer. Since its inception, the company had expanded plant operations multiple times and was experiencing another promising phase of growth. There was an imminent need to assess how the company would improve to meet new demand, bring modern efficiencies to existing production lines and easily scale to manage growth over time.

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The Challenge

The manufacturer's challenge was not to add more production lines as it had done in the past, but rather to dramatically increase efficiency, production and speed through other means. The plan called for modernization of systems and technologies to invigorate the business at its core.

The plant produces a larger and more diverse collection of products on their lines compared to similar companies in the confectionery sector. A sophisticated blend of processes and products, combined with high volume and diversity added complexity to the challenge.



Scope of what an upgraded technology platform needed to do

- Utilize some existing hardware and software in the upgrade to control spending and deliver ongoing ROI on previous IT investments
- Be completely open for local maintenance, servicing and data availability
- Integrate with existing plant, production and business systems, and enable seamless data collection and transfer across functions – from raw material supply to warehouse management and inventory systems, and beyond
- Allow deep customization for a proprietary look and feel for screens, system interfaces, functionality, operator efficiency, and a large quantity of product recipes
- Immediately deliver higher levels of efficiency and performance
- Provide scalable technologies to accommodate continued growth over the long term

The upgrade would involve moving away from the proprietary OEM system the company had been using for years, and eliminating technological barriers to advancement. For example, engineers were unable to maintain the existing system. Source code wasn't always in their hands when they needed it, and often, they couldn't make system modifications on their own. Additionally, engineers and other business units had to work with data from disparate systems, which, coupled with inherent manual processes, impeded plant- and company-wide efficiency.

The Solution

Through collaborative consultation with the Siemens team, it was determined that the manufacturer would be able to adopt an integrated solution that leverages existing and new technologies, along with the synergies, customization and capabilities in the scope of needs. Emphasis would be placed on promoting an open IT platform and data-driven manufacturing operation.

Over-arching goals were to improve process efficiencies that ensure quality, cost control and on-time delivery; enhance company-wide operations; and give the manufacturer decades of solid and scalable performance.

To achieve this end, one main process controller was installed and configured to control product and production lines, and serve as the data concentration hub for all points in the manufacturing process.

Broad-scope efficiencies and data transparency are delivered through a client/server SCADA solution with open database access for data transfer to other business systems.

All of these capabilities are accomplished in a single engineering environment to streamline implementation, and ongoing development and system support.



Products used in the upgrade

- The SIMATIC S7-319 controller is the high-end CPU offering the largest memory and fastest processor in the SIMATIC S7-300 CPU family. The S7-319 provides high-speed program processing and communications, precision, and the integration of high-performance and complex applications, such as counting, measuring, closed-loop control, cam control and motion control.
- Using the latest SIMATIC SCADA solution gives the manufacturer solid advantages for ongoing system implementation. Open platform communications (OPC) and an OLE DB server provide visualization and tools for plant-wide and business system data transparency. This engineering framework also provides the tools to code programmable logic controller (PLC) and SCADA systems.

These products are allowing the manufacturer to do more with newer technology.



The Results

The critical nature of this manufacturer's product lines required that the system upgrade be implemented in two phases. Phase one was completed in 2015 and the final phase will be completed in 2016.

Automation delivers 15 percent more time-efficient operations and ensures accuracy by eliminating potential for manual data entry errors. The manufacturer runs 300-400 raw material transactions during a 12-hour shift. Before the system upgrade, operators manually input material usage into the warehouse management system. This critical process required one to two minutes per transaction. Through advanced automation, speed, efficiency, accuracy and cost controls are substantially improved.

The S7-319 controller provides the means of communication with all sub-processes in this high-volume, 24/7 manufacturing operation, along with the memory and processing horsepower to handle complex line controls, from material handling all the way to finished product.

Operators have greater control and better utilization of equipment that is customized to the manufacturer's processes. Results include faster and more precise scheduling, more efficient spacing of orders, and higher system utilization that increases daily production. Additionally, integration with other business systems saves time and reduces potential for manual data entry errors. This is especially important for maintaining correct inventory levels, the lifeblood of an around-the-clock manufacturing operation.

Competitive advantages gained through Siemens

Three on-board communications interfaces in the CPU:

The SIMATIC S7-319 controller used in this manufacturer's application is unique in the industry. Other controllers typically require many communications modules to accomplish what the S7-319 can do. Specifically, the S7-319 provides all necessary communications interfaces right on-board the CPU. This was important for the manufacturer's desired application. Of the three on-board communications interfaces, two handle serial-based protocols for PROFIBUS networks and distributed I/O applications and drives. And the controller also has an on-board Ethernet interface that handles PROFINET protocol for distributed I/O.

Far-reaching value of customization and data

transparency: The manufacturer knew that the Siemens team, technologies and engineering tools would deliver the type and level of system customization they wanted – from the look and feel of their new HMI SCADA platform, to the interface with their existing business systems, and right down to custom recipe integration.

Best practices and thoughtful collaboration delivered the design, functionality and operating efficiencies the manufacturer desired. Siemens provided the tools to allow its Solutions Provider [DMC](#) to perform a substantial amount of engineering design work to enable custom interfaces with warehouse and inventory systems, as well as the R&D group for recipe integration. DMC then provided the tool set to facilitate the manufacturer's access to data across the enterprise.

A highly efficient program structure

The Siemens program structure supports the latest best practices and techniques from a programming perspective, such as object oriented programming and reusable code.

These efficiencies are key to getting the most out of flexible open systems and facilitating data transparency. They also cut development time and make the system easier to maintain.

Value in the Siemens business model: For this manufacturer, the system upgrade involved more than great products, features and implementation. They wanted the larger service infrastructure they have relied on for years: a strong, interdependent relationship with their local Siemens distributor, their local Siemens Solutions Provider, and their Siemens team. For this project, Siemens was heavily involved in the decision-making process for what hardware, software and communications architecture would be used, and the local Solutions Provider assists the manufacturer in programming, development and system implementation.

At this juncture in growth and advancement, the manufacturer wanted all hands on deck to ensure a successful project implementation, and they invested the time and resources necessary to do it right. As a result, this leading confections manufacturer has placed its plant and operations on a path to meet a promising future head on.

Learn more about these products from Siemens Digital Factory

The [Siemens Digital Factory \(DF\) Division](#) offers a comprehensive portfolio of seamlessly integrated hardware, software and technology-based services that support manufacturing companies worldwide. The Division exists to enhance the flexibility and efficiency of manufacturing processes, and reduce manufacturers' time to market.

SIMATIC S7-300 CPU 319-3 PN/DP

- The CPU with high command processing performance, large program memory and a quantity framework for demanding applications
- A central controller for production lines with central and distributed I/O on PROFIBUS and PROFINET networks

SIMATIC WinCC Professional V13 SCADA

- A totally integrated automation (TIA) portal supporting process visualization and SCADA applications with plant intelligence

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