



# Tobacco & Similar Production

A Selection of Global References & Case Studies



# Outcomes



## Increase visibility

For many consumer goods manufacturing companies, the majority of the workforce is on the plant floor, working at individual pieces of equipment or on production lines. Establishing near real-time visibility into equipment health can empower operators to quickly identify problems and decrease unplanned downtime.



## Optimize operations

By integrating and analyzing the data being generated on production lines, improvements can be made across plants including on batch variation, ingredient consumption, quality costs, waste, and management of abnormal situations. Optimizing consumer products manufacturing also alleviates knowledge gaps between experienced and new operators.



## Improve quality and output

By monitoring the health of your equipment and production lines with industrial applications, consumer products companies can shift from schedule-based maintenance practices to condition-based or preventative maintenance practices. This helps eliminate vulnerabilities in the production lines —improving both product quality and output.



## Increase agility

Manage your batch execution for greater agility and reduced costs. You can streamline end-to-end operations, ensure product quality, and drive high-volume production, even when switching products between batches is a requirement.



## Adhere to regulations

Complying with stringent regulations is a must. Support your traceability, data management, reporting, and continuous improvement needs with proven, modernized technologies. Furthermore, enforce Standard Operating Procedures by guiding operators through the right steps and tracking performance.



## Speed time to market

Improve your ability to compete, penetrate new markets, and even speed production of existing products with digital transformation. You can improve local production operations while meeting global requirements. With a connected enterprise, you can accelerate time to market and boost competitiveness.



# GE Digital in Tobacco Products

## *Manufacturing Around the World*



**50+** tobacco-related customers,  
including in nearly every province in China

**100+** tobacco products plants using  
GE Digital software

**5** continents with tobacco manufacturing  
using GE Digital software

**4%** increase in efficiency

**5%** decrease in raw material waste

### Experience

- Traditional (combustible including smokeless), specialty, and newer reduced-risk products
- Multi-national manufacturers as well as single-plant companies and OEMs
- Long-term relationships: decades of experience
- All levels of automation: From machine/equipment to individual plants to enterprise level
- Diverse: From raw materials processing to finished goods packaging
- Manufacturers, OEMs & Systems Integrators



# Beijing Dart Streamlines Operations with Centralized Monitoring for Chinese Tobacco Manufacturers



# Company:

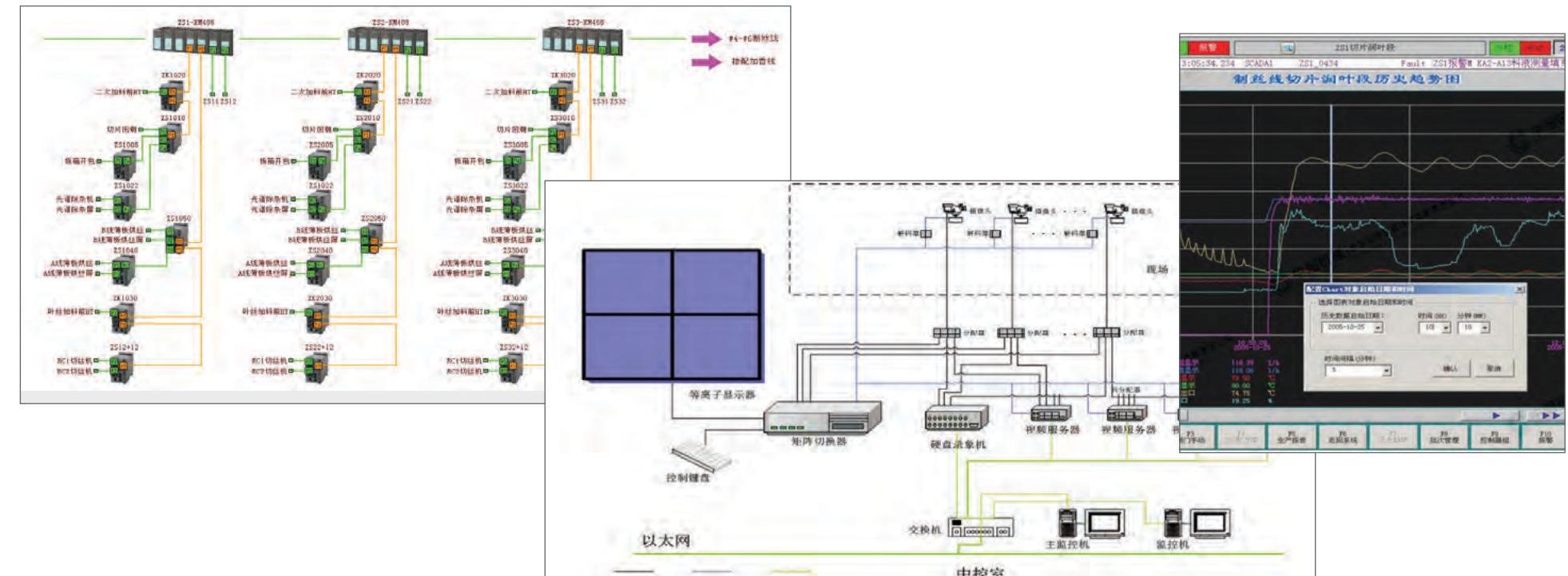
Beijing Dart Integration Technology Co., Ltd. Zhang Dongyue

## Solutions:

- Centralized monitoring system
- Real-time visualization and control
- Industrial data management – real time and historical
- Information anywhere, any time through web browser

## Products:

- iFIX HMI/SCADA
- Proficy Historian
- Proficy Webspace



## Results:

- Improved production efficiency
- Powerful scalability
- Faster decision-making



# Centralized monitoring in tobacco production

With recent innovations in automation and IT, the combination of industrial automation and management information is an important trend in industrial control systems. In the tobacco industry, the centralized monitoring system is an indispensable part of the overall centralized control system framework.

After a comprehensive analysis of several HMI/SCADA software platforms, Beijing Dart Company chose GE Digital's powerful Proficy software suite to realize the functions of the centralized monitoring system of cigarette factory production lines.

Based on successful project implementations in Shanghai, Chengdu, Mianyang, Wuhu, Longyan and other provinces and cities in recent years, Beijing Dart has exceptional experience with the design principles of integration, scalability and versatility of this entire centralized monitoring system.

There are several aspects to the advantages of the centralized monitoring system designed with GE Digital's Proficy software for tobacco production – featuring iFIX HMI/SCADA, Proficy Historian for industrial data management, and Proficy Webspace for browser and mobile access.

## Proven and complete multi-interface graphical system architecture

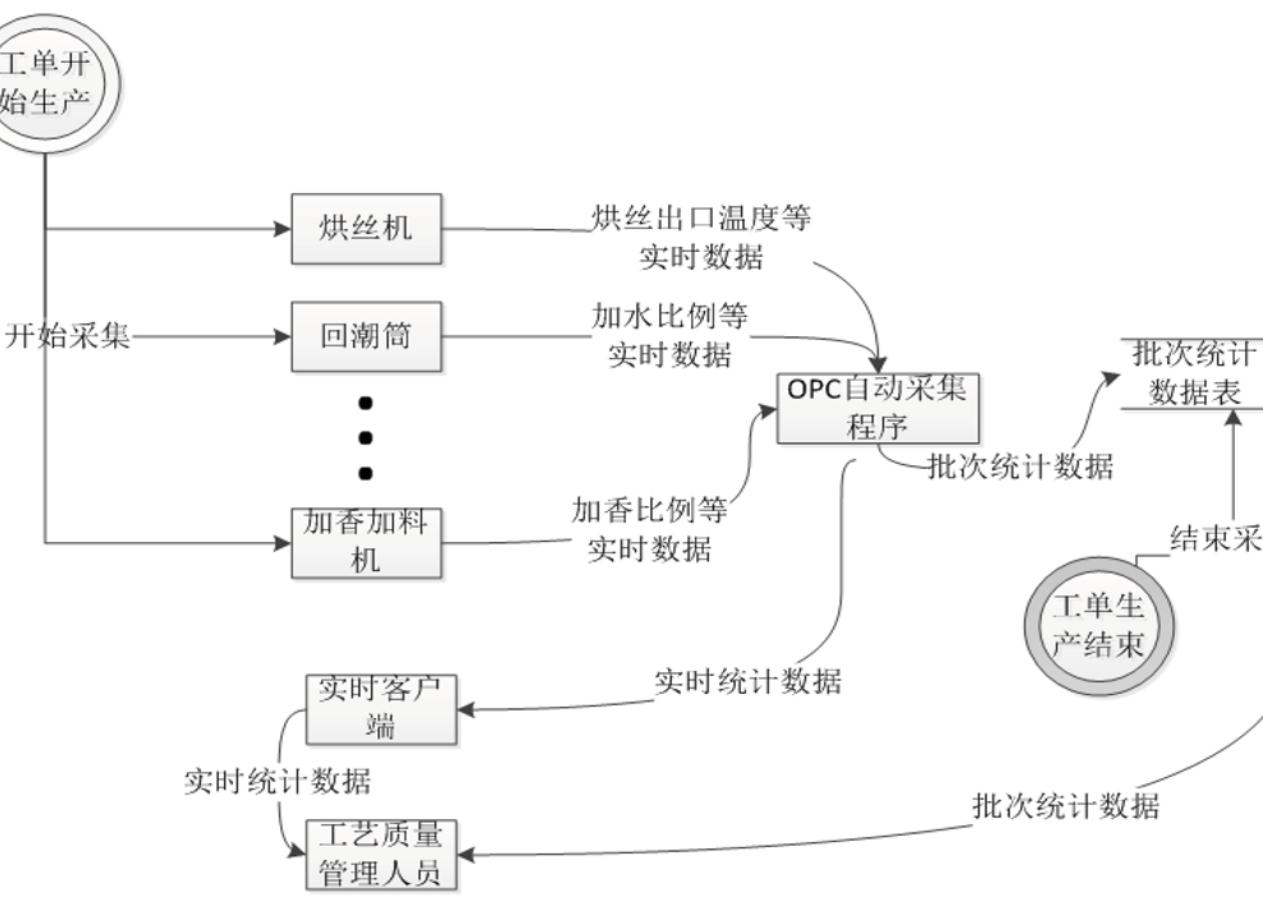
The iFIX configuration platform provides an effective, comprehensive solution for the construction of the centralized monitoring system for the tobacco production line as well as the real-time monitoring and control of the production process.

Using the Proficy platform that comes with multiple communication protocols including OPC, the system collects the production data of the PLC in each process section at the device layer.

At the same time, through the upper-level information management network, the system uses cross-platform interface protocols to obtain data such as recipes, process standards, production plans and scheduling tasks from the production management system. The solution uses the control network to issue production instructions, control parameters and other information to the equipment control system PLC to realize information production.

The centralized control system collects production process data and records it in the database for use by the production management system.

The centralized monitoring system is an important part of control intelligence. Operators can realize rapid production operation and improve intelligence through simple menu and graphic operations.

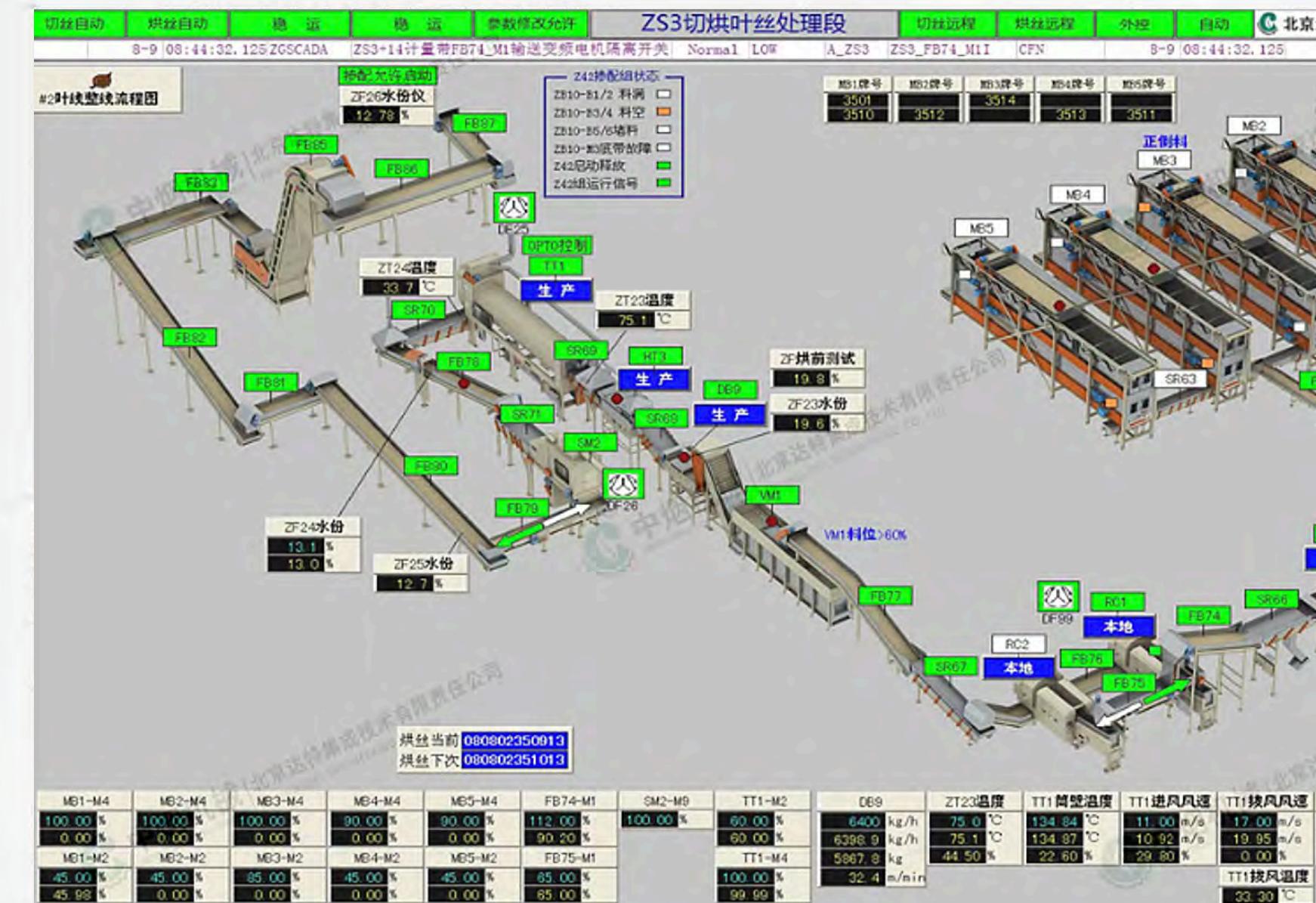


# Web publishing, application of intelligent platform visualization solutions

With recent innovations in automation and IT, the combination of industrial automation and Browser/server (B/S) is a network structure mode that is widely used. A Web browser is the most important application software of the client. This mode unifies the client, concentrates the core part of the system's function realization on the server, and simplifies the development, maintenance and use of the system.

The Proficy software solution utilizes information publishing under the B/S architecture. The user installs the latest Proficy Webspace network publishing software on the server side, and the client can use the Web browser. The Webspace server and the iFIX server conducts data interaction, and the browser provides the monitoring screen. At the same time, the intelligent platform visualization solution, Proficy Webspace, provides the following, easy-to-use functions:

- Real-time data – update the client directly so that users can respond in real time.
- Multi-session interface – supports multi-tab browser
- Secure-by-design container – compatible with third-party control technology applicable to Microsoft, AB, Siemens
- Electronic signatures – electronic signatures enhance network security and audit trails
- Animation – supports IFIX monitoring animation and script display
- Controls – All controls can be operated and set up secure by design as in the client environment
- Alarms and warnings – view, activate and acknowledge alarms like a thick client
- Third-party applications – third-party applications can be effectively triggered in the Web page



## Industrial network management and diagnostics system

Network management generally refers to the monitoring, analysis and control of various devices in the network system, so as to ensure the reliable and effective operation of the entire network system. Previously, in the field of automation control in the entire tobacco industry, network diagnosis was often limited to the upper computer directly obtaining the power-on and fault information of the IO substation equipment of the process section from the PLC, but it could not provide more intuitive and effective information for important network "bridge" switches and routers. The diagnostic information and detailed view of the system lacked

good management and maintenance functions, and the recovery speed was slow when a failure would occur.

Using iFIX and the OPC protocol in the centralized monitoring system and through the establishment of a web management service, tobacco companies can realize the collection, analysis and diagnosis of the status of network switches and routers.

The communication protocol based on network hardware is used for web management. The centralized monitoring system can directly connect to the physical switch to obtain diagnosis and maintenance information.

The PLC control system can perform centralized diagnosis of the status of the subnet switch in the hardware device and feed it back to the central control system, which can greatly shorten the development cycle. When a network failure occurs, it can be located, maintained, and restored directly from the monitoring system, improving the stability of the network system and the ability for early warning of failures.

## Effective integration with on-site video monitoring system of tobacco production line

The centralized monitoring system built through the iFIX configuration platform can provide a data interface integrated with the on-site industrial video system, and integrate and display information via the industrial video system.



- In the real-time monitoring system of the production line process of the centralized monitoring system, the dynamic monitoring screen of the third-party on-site industrial video system is embedded to realize the integration of digital monitoring and image monitoring.
- When the centralized monitoring system detects important equipment failures, critical process area failures or other important events, the video switch button at the corresponding position in the monitoring process screen will appear accordingly. By clicking this button, the scene can be displayed in the monitoring system. The video screen of the probe switches to the fault point area.



# Powerful historical data collection and storage function

The application of Proficy Historian for a plant-wide historical database can help operators, production supervisors, maintenance personnel, support personnel and business personnel manage and improve the performance of factories, workshops or production equipment.

The Proficy Historian solution is easier to implement and manage than the traditional historical database. Installation, configuration, and management of historical data collection with Proficy Historian requires very little work.

The automated configuration process can help identify and connect the underlying control system, and quickly configure and start data collection. By using the native interface, it provides a convenient connection with other systems, allowing the daily management of each distributed Historian subsystem to be completed in the central control room.



*Reliable and real-time access to accurate information is an important part of improving productivity and production efficiency, speeding up the decision-making process and helping to reduce production bottlenecks.*

Using Proficy Historian's database and screen platform editing software, the solution can display the historical records of key process parameters and equipment operating status with trend charts and reports, providing timely and accurate quality evaluation and production status evaluation for process control for better lean control and smart scheduling. The historical curve window provides historical data analysis of important process data in a selected period of time such as 60 days, 90 days, etc.

## Results

The centralized monitoring system for tobacco production line designed with GE Digital's Proficy software meets the diverse control needs of on-site users, improves production efficiency, and accelerates operator and management decision-making.

At the same time, the platform also has the powerful advantages of good scalability and strong integration for data collection and analysis.

Beijing Dart has deployed the application of this software solution in many cigarette factories and has won unanimous praise from users.





# Global Tobacco Manufacturer Enables Just-in-Time Operations across 15+ Plants

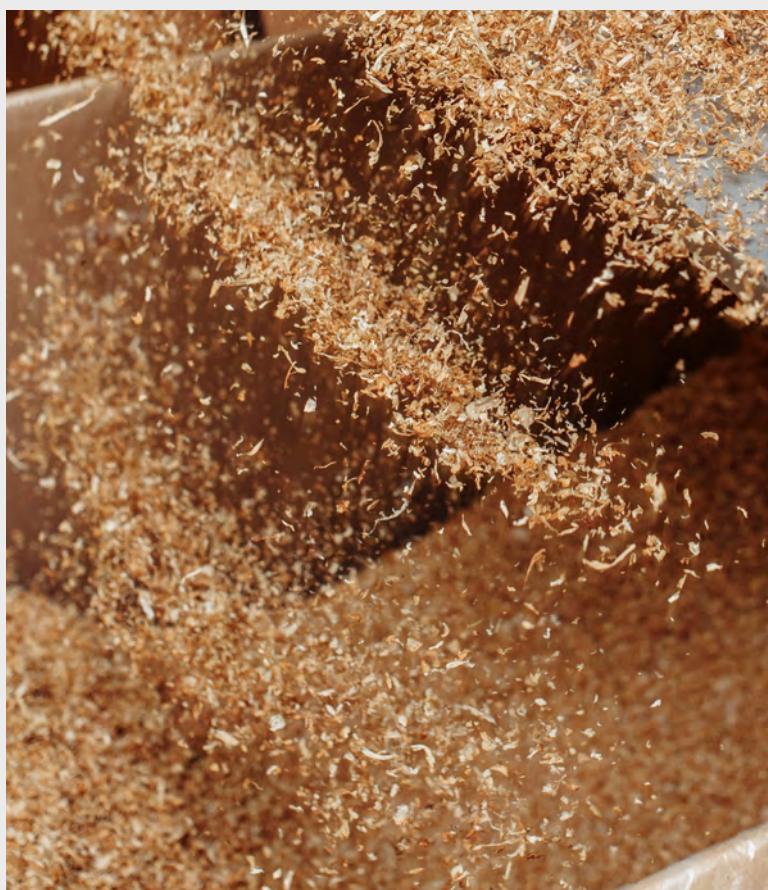


## **Customer Challenges:**

- Higher costs with multiple MES systems across global plants
- Need to improve visibility to support just-in-time manufacturing decision-making
- Need to improve efficiency, reduce costs, and improve quality

## **Results:**

- Maintain quality standards
- Deliver the right data for just-in-time decisions
- Identify causes of yield losses and production inefficiencies



### **Products**

- Proficy Plant Applications
- iFIX HMI/SCADA
- Proficy Historian



### **Achieving Just-in-Time Manufacturing**

This large, multi-plant tobacco company sought to standardize its manufacturing systems and enable just-in-time decision-making across 15+ global plants.

Challenges included connecting to OPC and non-OPC compliant equipment, improving operational efficiency, reducing costs and boosting quality and throughput.

### **Meeting Growing Customer Demands**

The company implemented GE Digital's Proficy Plant Applications, iFIX HMI/SCADA, and Proficy Historian across 15+ plants, optimizing operations with the right data. Results include higher efficiency and less waste using the Proficy solution globally.



# Chinese Tobacco Products Manufacturer Increases Efficiency by 4%



# Real-Time Visibility for Better Decision-Making

With GE Digital's iFIX HMI/SCADA, operators can leverage real-time visibility and control for better decision-making and take proactive actions that improve production. Additionally, the MES capabilities of Proficy Plant Applications have delivered clear insight and analyses to enable real-time decisions and improve overall efficiency, quality, and reliability of the process.

## Manage Process Complexity While Optimizing Production

With the challenging mix of complex recipes/specifications and high-speed processes in tobacco products manufacturing, the Proficy solution is uniquely suited to collect and correlate high volumes of quality and event data—driving improvements. GE Digital's solution has enabled the manufacturer to act on critical process information to improve productivity and manage multiple new product introductions with optimized efficiency.

## Challenges

Upgrade existing automation infrastructure to handle multiple product specifications and recipes

Improve overall quality, reliability and efficiency as more complex tobacco cutting, flavoring and blending processes were launched

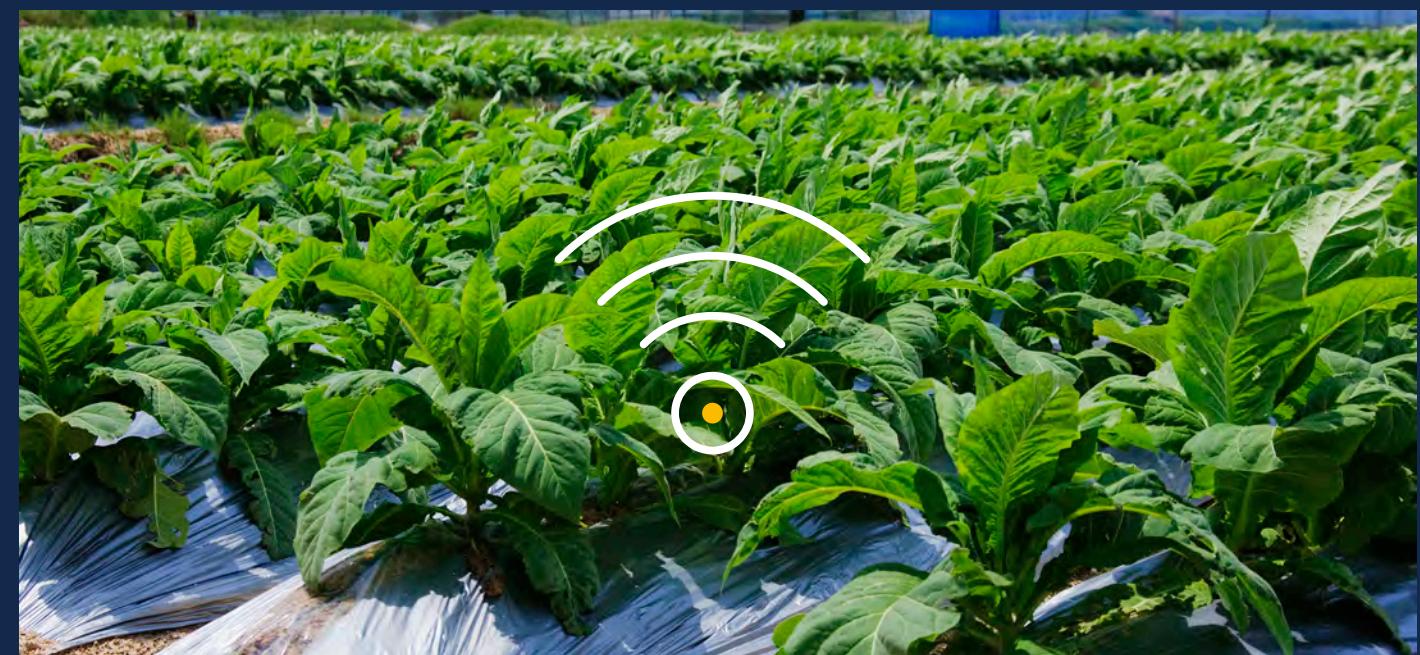
## Products

- iFIX HMI/SCADA
- Proficy Plant Applications
- Proficy Historian



## Results

- 4% increased efficiency
- 5% reduced raw material waste
- Increased flexibility with a single platform to manage multiple product recipes and specifications





# Qinhuangdao Tobacco Machinery Co. Uses GE Digital's Automation for Large-Scale Complete Equipment Manufacturing





## Solutions

- Reliable monitoring and control with modern HMI/SCADA
- Alarm notification to improve uptime
- Real-time and historical data for trending and analysis

## Monitoring and Control in Tobacco Production

*Qinhuangdao Tobacco Machinery Co., Ltd. is a wholly state-owned subsidiary of the China Tobacco Monopoly Administration. It is the only large-scale complete equipment manufacturer directly affiliated to the tobacco industry that manufactures silk thread, threshing and redrying, and carbon dioxide expanded shredded tobacco. The enterprise was established in 1967 and was jointly invested and restructured by China Tobacco Machinery Group Co., Ltd. and Hebei Tobacco Company (later Hebei China Tobacco Industry Company) in March 2002.*

*Qinhuangdao Tobacco Machinery Co., Ltd. has cooperation with tobacco companies in almost every province of China.*

## Products

- iFIX HMI/SCADA
- Proficy Historian
- WIN-911
- Industrial Gateway Server (IGS)



# Tobacco Manufacturer Ensures Stability of Moisture Content with New Dryer Control System





## Challenges

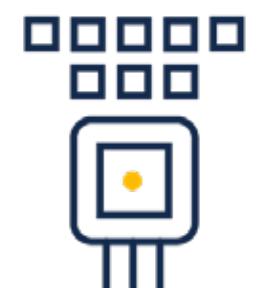
- This large tobacco products manufacturer needed to improve the stability of the moisture content in its cut tobacco.
- Increase quality and conform to specs
- Reduce costs while improving throughput

## Results

- *Enhanced productivity while reducing product costs*
- *Improved quality, helping to meet product standards*
- *Improved data access and visibility*
- *Accelerated operator response with modern screens, centralized visualization, and alarm management*

## Products

- iFIX HMI/SCADA
- Proficy Historian
- Proficy Webspace





# Automation System for Tobacco Shred Production Line



## *Stability of the shred thread production automation and its reliable operation are key to ensuring quality.*

### **Background**

This major manufacturer's plant needed an automation system for a 5000kg/h tobacco primary processing line for its shred production. The aim of the shred production line is to resurge, charge, cut into shred, and dry the tobacco leaf and stem which has been processed in the stem-dried factory. Next, the processed tobacco shreds are blended and fragrance added in accordance with the product requirements. Finally, the shredded tobacco will be produced which is suitable for future tobacco products production.

### **Action**

#### **Automation Drives Operations**

Using iFIX HMI/SCADA from GE Digital, the company's production includes six operating processing lines: online moisture regain processing line, leaf processing line, shred processing line, stem shred processing line, mixed stem shred processing line, and flavoring processing line.

iFIX provides monitoring and control of the production including the cut tobacco dryer control cabinet. Every operating line includes a main control cabinet, one to two field operator stations with iFIX, a distributed control box, and a distributed inverter. Additionally, operators can oversee operations from the central control room.

The central monitoring system comprises two sets of I/O server, one data server (fault tolerance), real-time database server (fault tolerance), management of application server, Web publication server, and 6 monitors. The iFIX system uses a client/server structure to achieve monitoring, data acquisition and information management functions. The system sets up an engineer station to complete the programmed maintenance, system development and network maintenance. It also can communicate with other network or systems through external switch and routing equipment. The field operator stations use iFIX to realize equipment monitoring. It also can solve the problem of different I/O servers (in the central control room) failing at the same time which would lead production suspension.



### **Results**

*According to the manufacturer, the entire system works reliably, runs in good condition, and has perfect production management functionality. The system is very well reviewed by users.*



# Improving Tobacco Products Manufacturing with Sigma-Level Assessment and Optimization

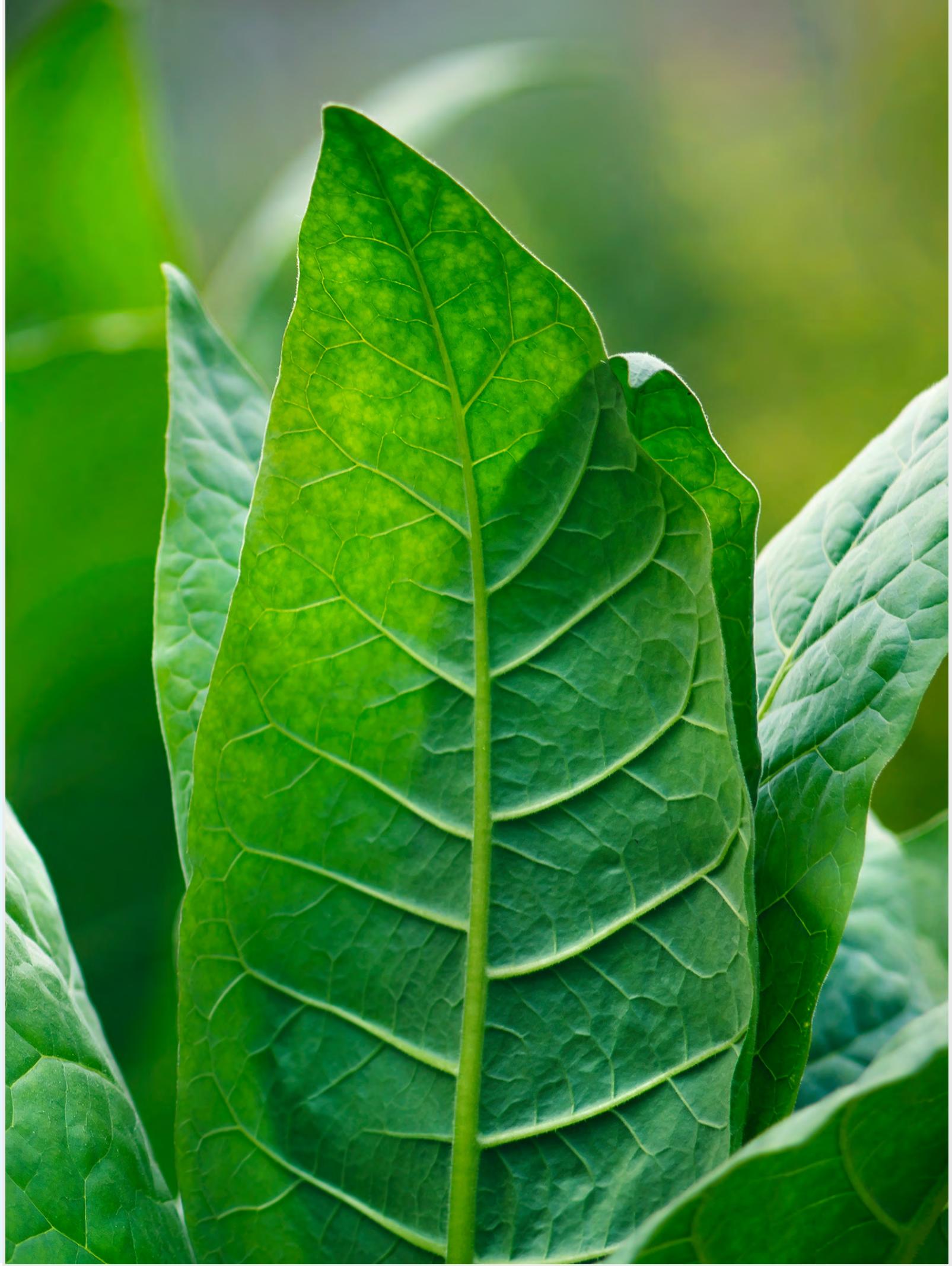


## Challenges

- This manufacturer sought to improve real-time quality control through Sigma-level assessment
- Time-consuming test processes
- Operators apt to make errors when estimating results

## Actions & Results

- Adopted Proficy Plant Applications for real-time data collection and analysis
- Data storage uses Proficy Historian, collecting data every 6 seconds and carrying out the acquisition of frequency and phase for each tag point. Historical data is archived monthly using GE's efficient compression algorithms
- Steady-state process control with digitization as the core
- Sigma level improved from 3.05 to 4.03 for higher quality and reduced raw material usage
- Key Performance Indicators (Complex Process Capability index)
- Solution includes: evaluation model management, data preprocessing, process standard management, silk workshop model management, roll package calculation model management, formula library management, results display, and more
- Calculates defect quality inspection statistical process, using the number of defects per million opportunities DPMO (Defects Per Million Opportunities) - then synthesized according to the three-layer relationship of process, workshop, and enterprise





GE Digital

# Digitization Step Change at Procter & Gamble Improves Performance

Diverse Consumer Products including Small Electric Personal Devices





## Company

Procter & Gamble

## Industry

CPG

## Products

Proficy Plant Applications, Proficy Manufacturing Data Cloud, Proficy Historian, iFIX HMI/SCADA, Proficy Workflow

Watch P&G Video #1

*Digitization is a journey, whether in a large or small organization.*

*Learn how P&G, one of the largest consumer packaged goods (CPG) companies in the world, has deployed Proficy Plant Applications at an enterprise scale to accomplish digitization step changes and achieve critical outcomes.*

## Mixed Manufacturing Environment

With diverse manufacturing requirements, P&G leverages a hybrid MES for both process and discrete capabilities in one solution.

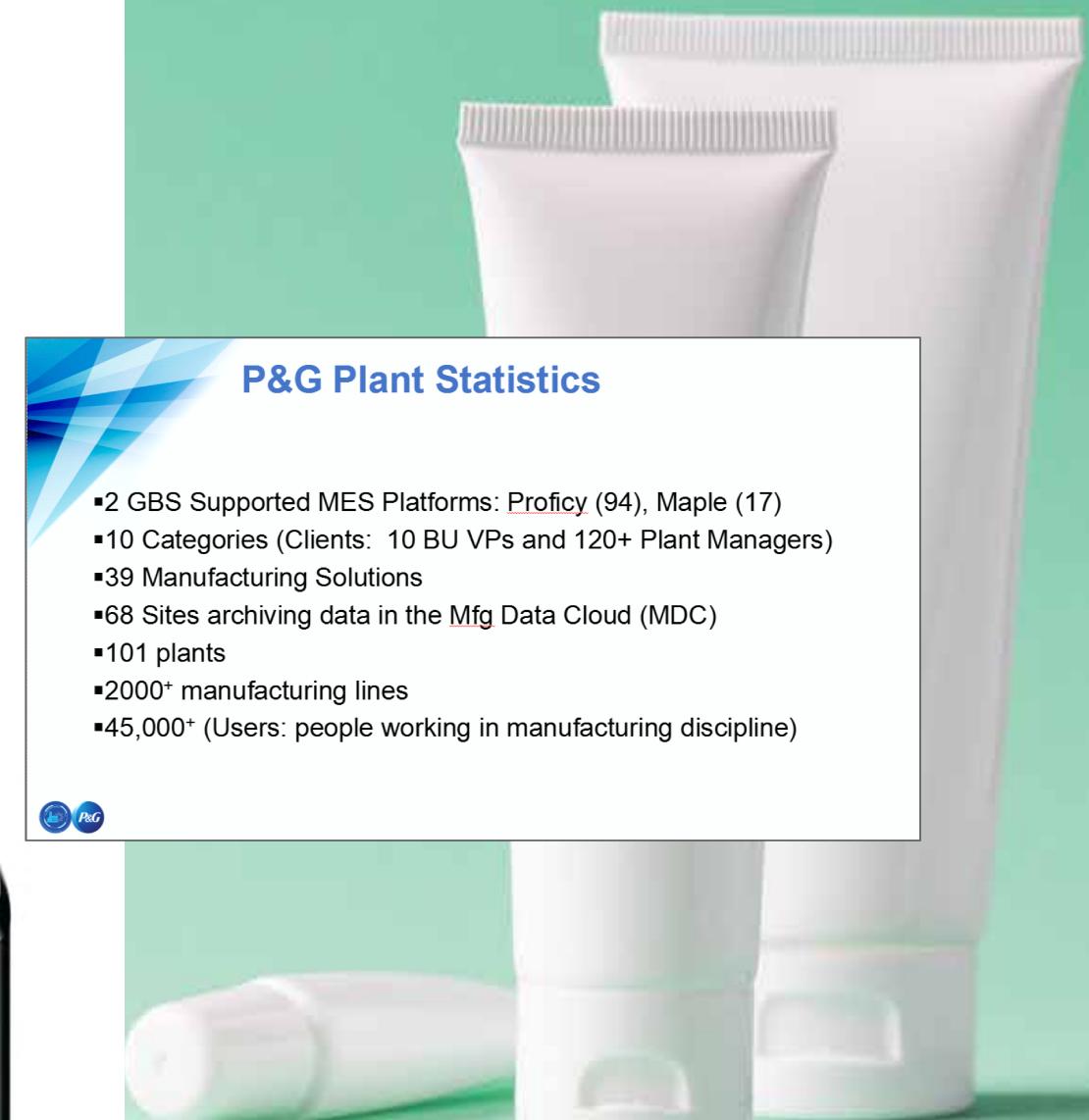
## Hybrid On-Prem / Cloud Approach

Furthermore, discover how P&G has employed GE's Manufacturing Data Cloud for an on-prem / cloud approach that improves performance, reduces costs, and provides a foundation for analytics and optimization.



## Results

- Improved performance
- Reduced costs
- Data analytics



### P&G Plant Statistics

- 2 GBS Supported MES Platforms: Proficy (94), Maple (17)
- 10 Categories (Clients: 10 BU VPs and 120+ Plant Managers)
- 39 Manufacturing Solutions
- 68 Sites archiving data in the Mfg Data Cloud (MDC)
- 101 plants
- 2000+ manufacturing lines
- 45,000+ (Users: people working in manufacturing discipline)



# Procter & Gamble

## Delivering Manufacturing of the Future

### Background

Procter & Gamble (P&G) is a fast-moving consumer goods company that's made up of several different business units that touch the entire spectrum of a person's life stages.

### Challenges

#### Keeping up with consumer demand

The company's technicians were often tasked with re-entering the same data across multiple systems, causing improper utilization of time and frustration among its operation teams. P&G needed an integrated system that would allow technicians to interact with data in real-time and at scale.

### Results

#### Unlocking real-time operational visibility

P&G was able to visualize its operations to achieve improved process reliability, production efficiency, and operational safety.

- Improved process reliability
- Increased productivity
- Improved operational safety



[Watch P&G Video #2](#)

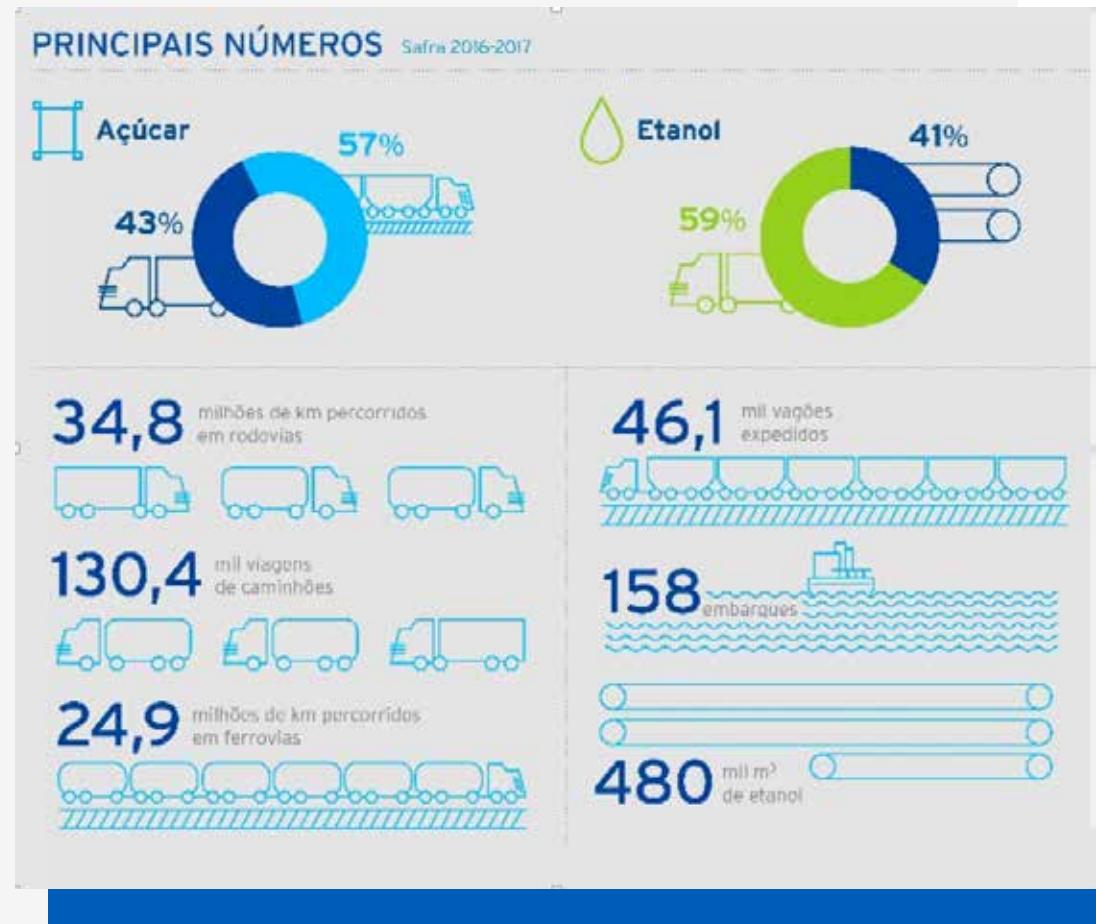


# Digital Transformation at Copersucar

360° view of a Port Logistics Operation

Copersucar is redesigning their processes, reformulating their operation and facilitating decision-making, to place the company in the map of Industry 4.0.





**Source:**

<https://www.copersucar.com.br/release/lucro-da-copersucar-atinge-r-254-milhoes-no-ano-safra-20162017/>

Working within the sugar cane supply chain and uniting field and industry, Copersucar is the largest Brazilian exporter of sugar and ethanol with integrated logistics throughout the business value chain.

With a unique business model in this sector, Copersucar doesn't count with production assets, but with sugar and ethanol acquisition contracts, supplied mainly by the member plants.

From the joint venture with Cargill, Alvean was created, which has accelerated the global expansion of the company.

Copersucar's strategy for sugar is based on the investment in multimodal terminals for the storage and transport of sugar, like in Ribeirão Preto and São José do Rio Preto, and at the Sugar cane Terminal Copersucar, located at Porto de Santos (SP), with a capacity of movement of 10 million tons of product per year.

Crop of 5.3 million tons of sugar and 4.2 billion liters of ethanol are commercialized with a \$254 million of consolidated liquid profit, at the end of the crop year. Copersucar owns the largest capacity of sugar and ethanol storage in Brazil.

For the products to reach their customers in tens of countries, it is necessary to have a complex logistics infrastructure, integrated by their own and contracted transshipment terminals and storage, in addition to an extensive outsourced road, rail and sea transport network.

# Challenge

When a major fire struck the warehouses of the company, Copersucar had the need to update the entire operation.

In the area of Industrial Automation, an audit was conducted to identify the improvement opportunities through upgrades, new technologies and new processes. The Santos terminal was operating with some level of industrial automation, but the possibility to reduce contingencies and making operation and maintenance more predictable was identified. Additionally, it was not possible to quantify the losses related to performance and efficiency problems in a detailed manner and with identification of causes.

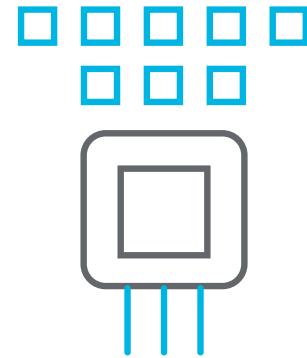
It was in this period that Copersucar brought in Marcelo Latrova to assume the Maintenance and Engineering Management, with a mission to redesign the processes and place Copersucar in the Industry 4.0 map, through the adoption of systems with an elevated level of integration, a consensus among the different approaches that exist today for digital transformation. Soon after, he had the arrival of the Industrial Automation Specialist Eduardo Pateis to supervise and implement the new project.

One of the priorities was to identify and address aspects of the process that could compromise the safety of the operation and impact daily production, due to possible unplanned downtime and complications.

With the new Industrial Automation project underway, Copersucar operates its regular activities at the same time as it manages the necessary changes, aiming at its modernization and increased efficiency as goals. This transition process is the most challenging point for the entire team of managers and operators.

Aiming for greater effectiveness, the team made the decision to restart and redesign processes and bring new technological solutions to overcome the challenges presented. It took nearly seven months within the Operational Control Center (CCO) to configure the systems.

The Engineering and Maintenance team is fully aligned with the corporate initiative, with the conviction that the project will increase Copersucar's competitive advantage. The current scenario is changing dramatically, however, with significant improvements at each stage.



# Solution

Aquarius Software was the chosen partner for this project, acting as supplier of the systems and assisting Copersucar in the solution design, software training and support for the implementation of each system.

The overall idea of the solution includes the technological upgrade of the supervisory system with revision of the architecture used, upgrade of GE Digital's iFIX HMI/SCADA system, configuration of Hot / Stand-by redundancy, server virtualization and flexible access to client interfaces, operation via Terminal Services, with access management via ACP ThinManager. Proficy Webspace allows viewing of the HMI/SCADA screens anywhere, any time through a web browser.

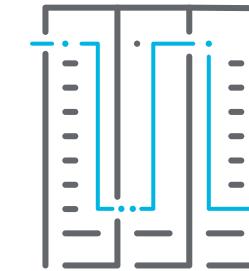
In addition, increased operational safety, change management and automated backup in automation applications (PLC and SCADA programs) will be delivered by AuVersy's VersionDog software.

Finally, through the implementation of the PIMS and MES suite, also from GE Digital, it will be possible to have the entire shipment process digitized, through the ERP (SAP) connection to obtain the information on what is stored and what to ship in each ship, following the execution of the loading and returning consolidated information on each operation.

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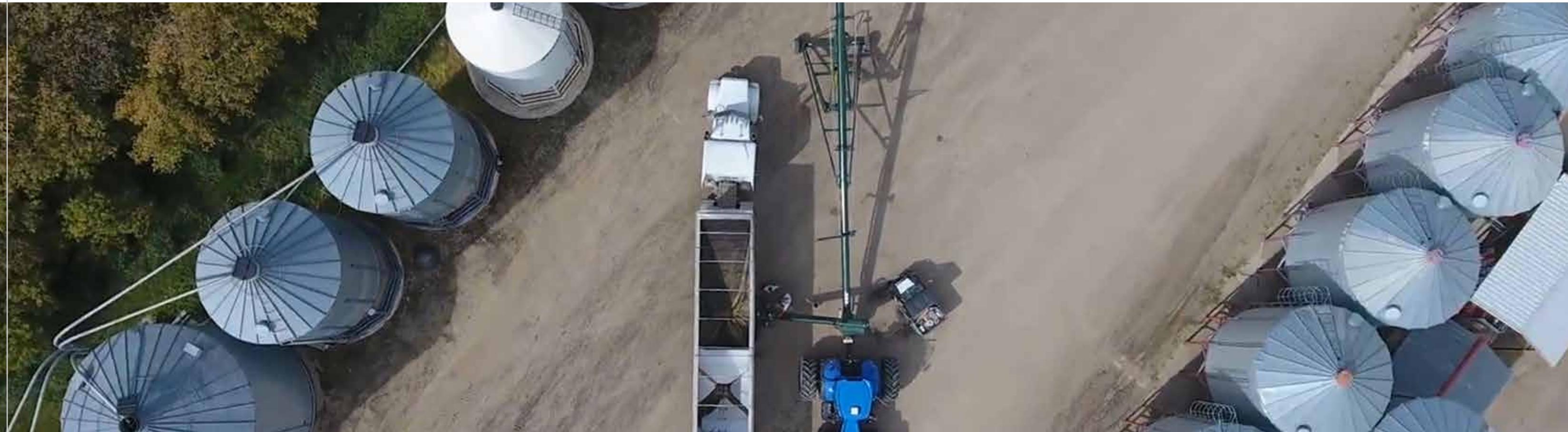
*“This project once again proved that it is possible to employ new software and services on existing technological bases, resulting in extraordinary results such as increased operational safety and greater integration between automation and corporate systems, with continuity of operation and investment greatly reduced.”*

— Diogo Gomes, Aquarius Software





# Australian Sugar Mill Speeds Cane Processing with Faster Production Through CIMPLICITY



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*With its sugar cane crop size growing nearly 4X over the last 10 years and being the sole sugar cane processing factory in the area, it was crucial that this sugar mill looked for a solution to increase processing rates. To achieve this, the Australia-based mill needed to implement a new automation platform in its factory areas.*

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As the mill's requirements for the control tasks ranged from simple to complex, GE's CIMPACT HMI/SCADA solution was chosen for its ability to support various configuration techniques and processors while monitoring I/O hardware. GE was also called upon to provide required technical training and support.

### **Innovation That Leverages Existing Infrastructure**

GE's CIMPACT solution provides the mill with the tools to design, implement and maintain process automation – using advanced strategies and utilities associated with distributed systems. The software provides the user interface to the control platforms and allows communication with third-party controllers, which are used for the mill's steam production, controlling all four boilers and equipment. The availability of common engineering tools and up-to-date documentation assists mill employees in providing solutions to problems.

This Australian mill intends to extend CIMPACT throughout its factory, further providing plant-wide optimization. This will ultimately provide faster and easier access to information from anywhere within their process.

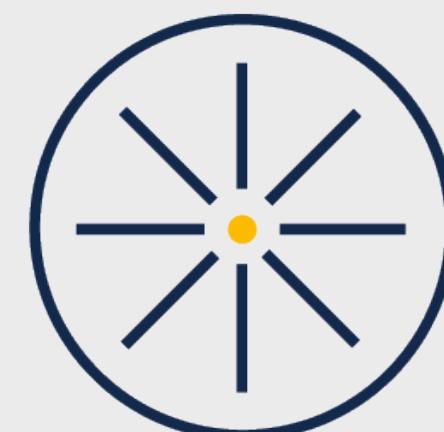
In addition, CIMPACT software's open architecture enables the mill to integrate future control solutions, embracing the new technology yet providing compatibility with existing older technology. The CIMPACT solution, which eliminates potential problems associated with inflexible, custom applications, provides a low-cost, easy-to-use solution for the mill's incremental system growth.

## **Results**

- **Faster production with modern automation**
- **Ability to meet significantly growing operations**
- **Phased approach drives incremental successes**
- **Easy configuration speeds implementation**
- **Flexible open architecture allows scalability as well as connectivity with legacy control systems**
- **Faster and easier access to information from anywhere**

## **Products**

- CIMPACT HMI/SCADA
- Proficy Historian





# International Rice Producer Supports Global Environmental Agreements and Reduces Downtime



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*By-products from this international rice manufacturer's food processing is put to good use in their energy plant in Europe rather than adding further waste into the local environment. Instead the biomass is turned into useful electrical energy which is exported into the national grid system. CIMPACT HMI/SCADA provides the vital role of monitoring and controlling the plant, which effectively contributes to the European Community's commitment to global environmental agreements.*

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This company is a major international producer and supplier of rice products. It produces a wide range of rice for risottos, soups, sauces, puddings, and biscuits. It uses rice which is grown extensively across an area of Europe. The company also imports rice from Asiatic countries such as India, Pakistan and Thailand. The combined heat and power station constructed by the company is an important example of how it is possible to produce energy from alternative sources which often would be lost in other processes.

### Biomass Fuel Reduces CO<sub>2</sub> Emissions

At the rice manufacturer's energy plant, the "fuel" comes from biomass (a term which refers to any kind of material of organic, mainly vegetable, origin) rather than traditional sources such as coal, petroleum, and natural gas. The generation of energy from the combustion of biomass, unlike the generation of energy from the combustion of fossil fuels, releases significantly less carbon dioxide into the atmosphere, and thus contributes to the global environmental agreements to reduce CO<sub>2</sub> emissions. The biomass used by the company is mainly derived from the waste from agricultural and food processes, such as rice husks, but also uses recovered wood, such as dead branches or industrial waste from the local wood and furniture sector.

### Control and Monitoring System

The whole energy producing plant is monitored and controlled from a central control room. Three operators can view all areas of the plant using the visualization capabilities offered by CIMPACT HMI/SCADA. The operators use PCs in the control room, one of which acts as the main server while the other two are viewers. The PCs are connected via the network to PLCs which provide the local plant control. The system controls the grate, exhaust, boiler, water demineralization, condenser/phosphates, turbine, and more.

Thanks to the remote connection capabilities of CIMPACT, the plant processes can also be easily viewed away from the control room.

The plant is capable of producing electrical energy with a maximum output of approximately 6 MW. It comprises the following subsystems, overseen with monitoring and control by CIMPACT HMI/SCADA:

- Fuel dosing and stage system
- Steam generating boiler
- Exhaust gas treatment
- Condensation steam turbine
- Generator, transformer room and connection to the national grid
- Boiler water system demineralization system

The biomass is introduced into the furnace and completely burned. The furnace is fitted with a specially designed grate. This ensures that the slag that is produced is kept to a minimum. Also, the pollutant waste gases produced are minimized. The heat from the combustion process turns the water in the boiler into steam. This in turn is used to generate electrical energy in the turbine-generator system. The generator output voltage is 6kV. This is then converted to 15kV in the transformer room before its carefully controlled introduction to the national grid.





## Plant Downtime Greatly Reduced

The managing director of the plant said, “Thanks to GE technology, our renewable and alternative-fuel power plant is able to meet the energy requirements of several thousand families, while completely respecting the environment.

“Since the GE technology has been introduced the plant downtime has been greatly reduced, and the necessary information supplied to us is available in real time thanks to CIMPPLICITY.”

## Results

- Ability to support global environmental agreements
- Decreased downtime
- Real-time information available for better decision-making
- Remote monitoring and control for faster response
- Proven plant-wide supervisory control and data acquisition



# Americas Sugar and Ethanol Producer Improves Quality and Throughput



## **Customer Challenges:**

- Increase throughput capacity and alcohol yield
- Improve existing asset efficiencies
- Improve batch efficiency and consistency
- Address increasing demand for fuel alternative

## **Results:**

- Greater throughput and productivity
- Increased alcohol yields
- Better quality control
- Tracking of product genealogy



## **Products**

- Proficy Plant Applications
- Proficy Historian



## **Monitoring and Controlling OEE**

To turn sugar into ethanol, the manufacturer implemented Proficy Plant Applications software, enhancing automation with a comprehensive view of operations and managing recipes in the S88 format to protect intellectual property. The solution helped the manufacturer closely monitor and tightly control overall equipment effectiveness (OEE) of its ethanol production.

## **Meeting Growing Customer Demands**

The solution helped improve quality control and batch consistency, linking production parameters with quality measurements. As a result, the manufacturer has been able to improve efficiency and effectiveness to meet growing customer demands for fuel alternatives, and ultimately, increase profitability.



# Australian brewery improves scheduling accuracy and inventory tracking





## Challenges

- Difficulty adhering to scheduled quantities, over-runs and under-runs of orders in packaging
- Inventory and material consumption inaccuracies
- Coordination of changeovers and material waste

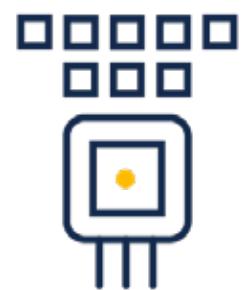
## Results

- ***35% reduction in product waste***
- ***5% increase in packaging productivity***
- ***90% decrease in finished goods holds and packaging waste***
- ***Tighter schedule adherence***

By linking plant and business systems, Proficy enables more precise coordination and control.

## Products

- Proficy Plant Applications
- iFIX HMI/SCADA
- Proficy Historian
- IGS





# Browar Warka Increases Bottling Line Efficiency with GE Digital

## Results

- The total number of mechanical and electrical downtime events decreased by 39%
- Access to accurate information on breakdowns and stoppages
- Potential for elimination of losses and stoppages
- Support of the TPM (Total Productive Management) system
- Increased the availability of machines, equipment, and workers

- Optimized the beer bottling process
- Web access to a variety of reports
- Elimination of time-consuming paper recording
- Ease of use

*"What is of greatest significance is that we now know what is wrong with the line. Thanks to automatic registration of stoppages, we know their causes and how much time they actually consume."*

**Krzysztof Żyrek**  
Production Director, Browar Warka

Companies operating in the food industry face stiff competition and customer satisfaction is of the utmost importance, creating a need for constant improvement in production techniques. To be able to remain ahead of their competitors, companies have to shorten both the launch time of new products onto the market and the time for processing orders. This requires increased production line efficiency.

Grupa Żywiec SA - Browar Warka, the second biggest brewery in the Żywiec Group in Poland, sells more than 2.7 million hectolitres of beer per annum.

"Increased effectiveness of bottling lines is one of the priorities for our brewery," explained Krzysztof Żyrek, Production Director at Browar Warka. "In order to attain this goal, we must be able to accurately describe all events that cause stoppages and slow-downs in line production. Thanks to the automatic online monitoring of our machines, our new manufacturing execution system (MES) is able to collect detailed data about the time and reason for each breakdown as well as to provide up to date information on line productivity to the management plus the line operators. It also enables analyses to be carried out later, which help to eliminate causes of the stoppages and aid engineers in their every day work."

Proficy Plant Applications from GE Digital provides information in real time about the bottling lines, enabling a quick reaction to potential problems. Supplied and developed by the local systems integrator, Bonair, the MES software solution used for the KHS (KHS AG, Dortmund, an international manufacturer of filling and packaging systems for the beverage, food, and non-food industries) bottling lines has improved its effectiveness, helping to eliminate stoppages and losses in the bottling process.

Prior to the implementation of Proficy Plant Applications, data on bottling line stoppages was entered manually into the Microsoft databases by operators. "The system was less accurate than the current one, and it did not register 'micro-breakdowns,' i.e. those under five minutes," continued Żyrek. "It also took a lot of the line operators' time."



Proficy Plant Applications includes modules such as Fault Analysis, Shift Analysis, and Location Analysis



## Measurement and analysis

The Proficy Plant Applications Efficiency module measures and analyzes parameters of efficiency and the degree of use of production resources—tools, machines, and people. Targets are set in production plans on how many thousands of bottles should be filled during an hour and over the entire eight-hour shift. In the event of the targets not being met, the Efficiency module shows the reason for the lower productivity of the line. Using analysis of micro-stoppages and breakdowns on production lines, the module reveals if the problem was caused by planned stoppages, machine breakdowns or defects in containers or caps. It could also be caused by a given personnel's inefficient handling of the line or slow reaction to machine jams or stoppages, or that certain label types cause the machines to jam more frequently.

The Efficiency module's ongoing monitoring of the production line enables up to date verification of whether a shift of employees have met their target, if the realization of the monthly plans are on track, and if any of the parameters are threatened.

## Implementation on time and within budget

At the beginning of the implementation process, technical infrastructure was installed and configured. Connections were made to interfaces at automation controllers on production lines, mainly the necessary devices for data collection. The data comes from sensors on the bottling line machines. It is recorded by Proficy Historian from GE Digital data collectors in real-time. The next stage of the implementation was the configuration and analysis of the data in Historian.

The bottling lines include a range of machines used, for example, for washing bottles, verifying their cleanliness, pasteurisation, filling, verification of the amount of beer poured into each bottle, capping, labeling, and unpacking and packing of crates. A key task was modeling all these machines together with a description of every state they could be in. A corresponding electrical signal in Proficy Historian was linked to each such description (stoppage, shortage, lowering/raising of forklift, etc.).

The software can then determine if a machine has stopped, released a faulty product, performed its operation incorrectly, or transferred to another machine a set number of items.

"The biggest challenge was to link the new MES to the original control system on the bottling line and this aim was fully achieved," added Źyrek. "We wanted an application that would be able to pinpoint the culprit machine from amongst a series of machines stopped at the same time. It was also important for us to enable operators to comment on given breakdowns and add planned stoppages—such as breaks, refittings and overhauls."

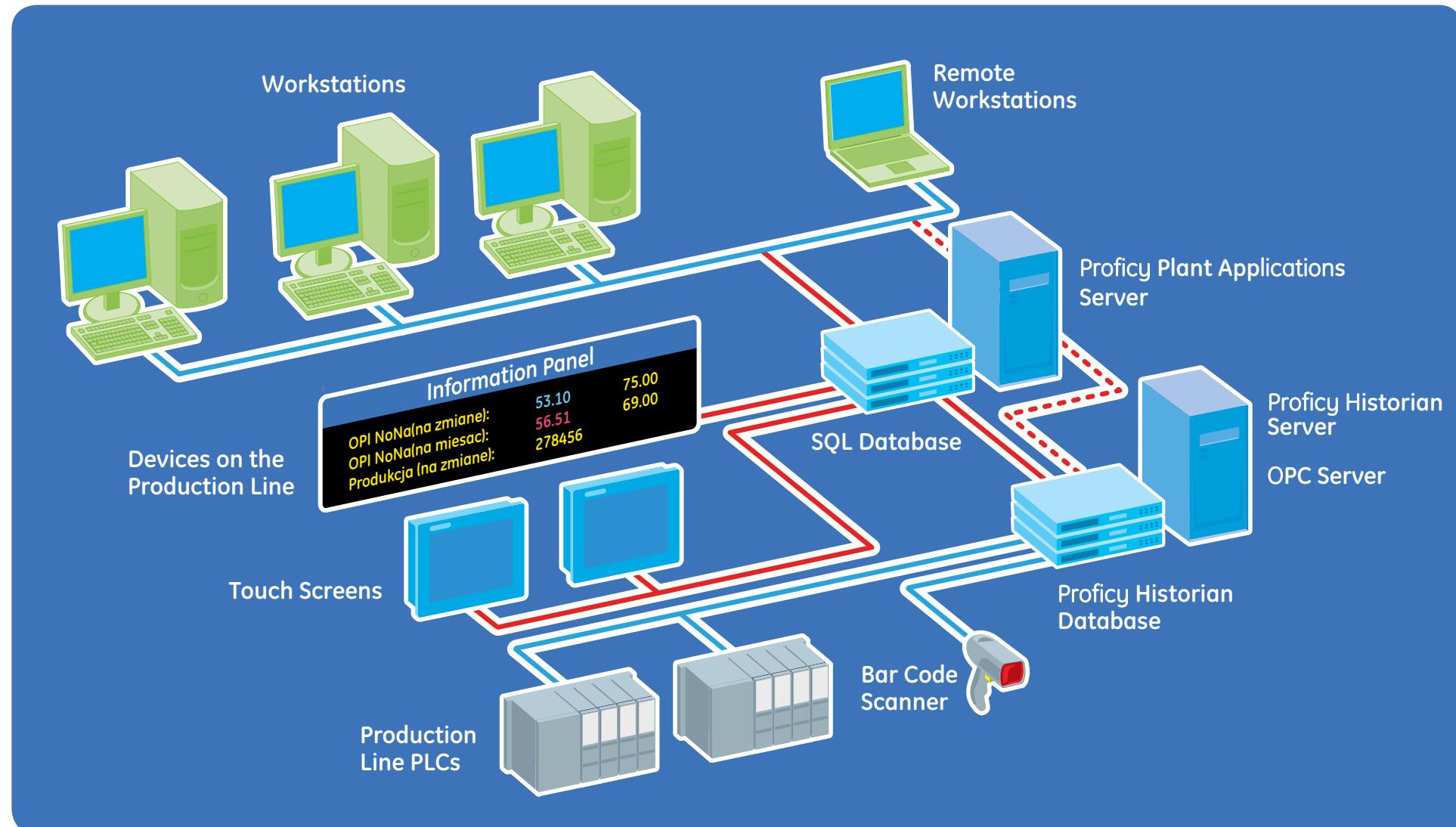
In order to meet the client's expectations, Bonair altered the concept during the implementation phase and created an additional application enabling machine operators to add more data on production line events. When stoppages occur now, operators can choose the appropriate reason from a list shown on the operator's touch-screen panel.

"Despite all these modifications, Bonair was still able to meet all the objectives and carried out the full implementation within the specified time," emphasised Źyrek.

## Automated reporting

It was determined at the modeling stage what type and form of reports the system was to generate. This request was facilitated by a GE Digital web-based solution that provides reports in real time. This capability provides a ready package of over 20 out-of-the box reports, which in effect reduces the cost of implementation and also subsequent maintenance and development of the MES.

Browar Warka management has ongoing access to overall weekly and monthly statistics. On the basis of reports and



analyses, they are able to check each shift's productivity, pinpoint machines where stoppages occur, and verify the duration and causes of the stoppages. Production line employees also benefit from automatically generated reports.

"Previously, employees monitored machine productivity by manually recording data on stoppages," explained Źyrek. "Now they are able to obtain this data automatically. Basic percentage parameters, such as the set plan for each shift and the current state of the plan's realisation,

are all shown on a big screen located in the plant."

## Experience decisive in system choice

At the competitive bid stage, the decisive factors in the ultimate selection of the solution were the wide functionality and open architecture of Proficy Plant Applications, and the experience and customer-friendly implementation approach of the local integrator. "Bonair has adapted the solution to the needs of our brewery," emphasised Źyrek.

Żyrek also pointed out other advantages such as the easy to use touch-screen panels on production lines, which enable operators to enter comments for each breakdown, convenient access to detailed reports that can be viewed on any computer by using an internet browser, plus the system's flexibility, enabling analysis of the collected data not just in the application created for this purpose but also in Microsoft Excel, for example.

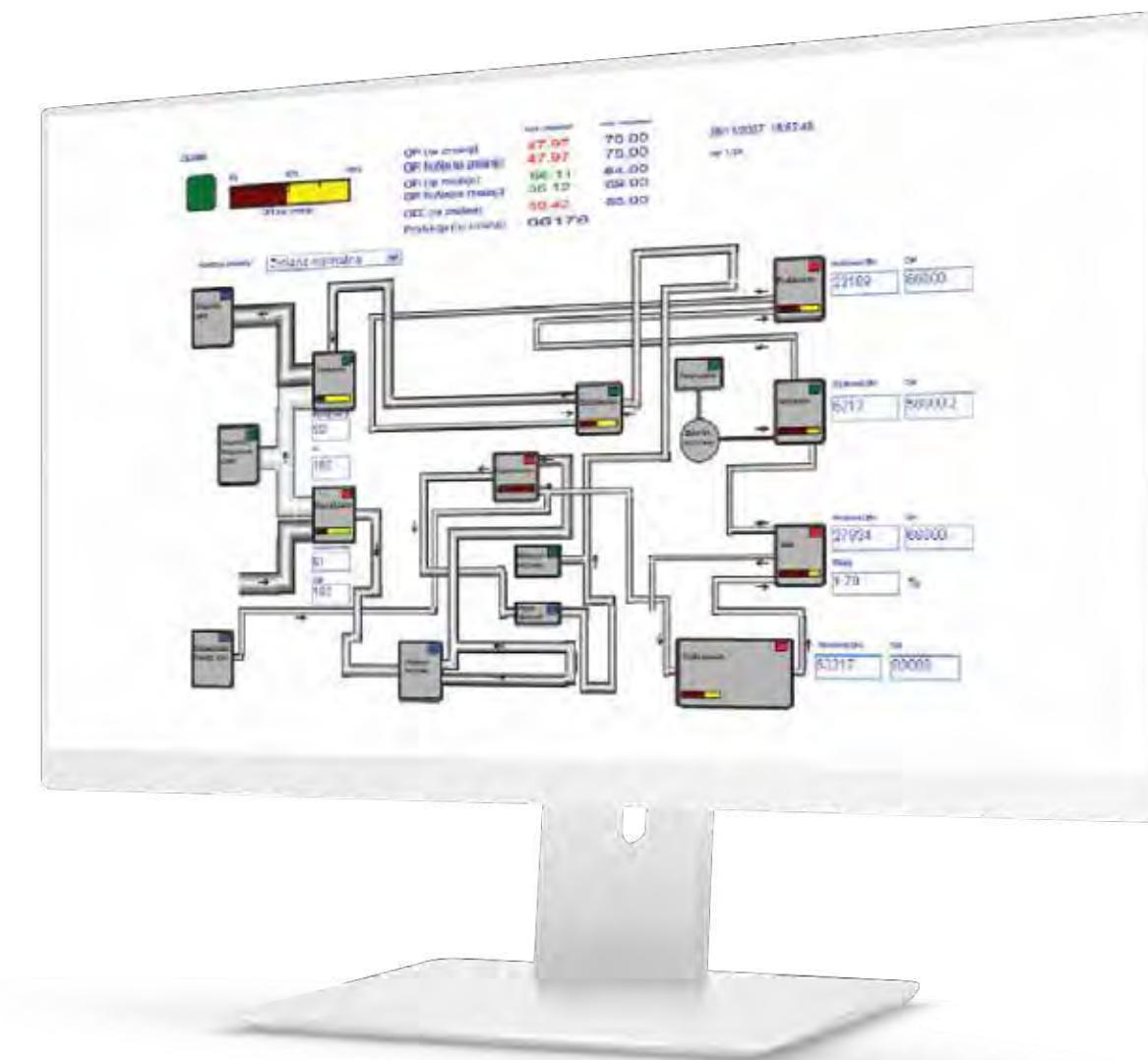
## What's next?

The system can point out bottlenecks but it cannot remove them. Żyrek continued, "What is of greatest significance is that we now know what is wrong with the line. Thanks to automatic registration of stoppages, we know their causes and how much time they actually consume."

Increased productivity is only the beginning. Browar Warka is considering implementing other modules of Proficy Plant Applications, including the Quality and SPC (Statistical Process Control) modules. "We know which direction we are heading in. We know that we have to focus on more automatic and precise control of the production process," added Żyrek.



Production, downtime and waste events timelines provide flexibility through clickable events displaying more information.



The software reports the actual state and efficiency parameters for every machine.



# European Fruit Concentrate Manufacturer increased productivity with CIMPLICITY



*In its plant in Europe, this company produces concentrates and other fruit products for customers all over the world. The hygienic and top-quality processing of up to 1,000 tonnes of fruit per day requires ingenious logistics as well as a largely automated production process.*

This global fruit concentrate manufacturer has grown significantly over recent years. In just a few years, from 5,000 tons of processed fruit, the yearly volume has increased steadily to reach 30,000 tons. The production capacity is expected to keep growing to more than 40,000 tons. This is as a result of a modernization project to renew the entire production plant. Rebuilding and new extensions have been completed.

## **World Class IT Infrastructure**

As part of the new IT infrastructure, a totally new network was installed. Four DP departments, Production/ Concentrates, Production/ Fruit Processing, Laboratory and Administration, are now integrated. The system comprises 70+ workstations and monitoring stations and six servers. Process control is carried out by PLCs, and the company chose GE's CIMPPLICITY HMI/SCADA software for control and monitoring.

The DP manager explained, "We have put into place a fail-safe solution. All information is gathered by the PLCs and then forwarded. CIMPPLICITY HMI/SCADA is run on these servers. The level of safety is 99.5 percent." Production is maintained 24 hours a day in three shifts, so any failure of the control system would create serious problems. This alone justifies the investment in redundancy.

## **Optimized Monitoring and Control**

During production, CIMPPLICITY is used to control and monitor pasteurizing and drying processes. It is also used to monitor the water conditioning, the power generation and the water purification plant. Under the modernization project, a double boiling plant with CIMPPLICITY has increased capacity. The DP manager continued,

*"Above all, using and programming the system has proved much easier than with previous systems. Processes are shown 'live' and can be directly influenced or viewed by way of a touch screen. The excellent visualization allows us to use all the data effectively and eventually also to benefit from savings and improvements."*

**The following advantages distinguished CIMPPLICITY from other control and monitoring solutions for this manufacturer:**

- Comprehensive process backtracking (e.g. for special customer requirements)
- Precise batch documentation for improved cost accounting and quality assurance. Each process step can be precisely assigned to the corresponding cost center
- All data coming from the PLCs can be forwarded with very easy selection and configuration
- Easy configuration option saves (external) costs and increases flexibility

- Forwarding of alarm messages and warnings
- Process visualization is possible on any screen, not just on one. In case of a screen failure, work can be resumed immediately using the next one.

## **Success and Expansion**

Bringing together and efficiently integrating process data, visualization, databases, redundant servers and the upgraded network was a big challenge for everyone involved, given the complexity of the project. The plant is now working to everybody's satisfaction. During production, the automatic process control and visualization is currently used for food processing only. CIMPPLICITY will again be used in the next step - to automate fruit concentration.

## **Results**

- Higher productivity with modern automation
- Redundancy supports 24/7 production for greater productivity
- Historical data for process backtracking
- Easy configuration saves time
- Faster response with alarms and warnings
- Information available where and when needed

## **Products**

- CIMPPLICITY HMI/SCADA
- Proficy Historian



# European brewery improves production and packaging processes



## Challenges

- Production efficiency and downtime
- Manual measurement system, compromised data
- Variable packaging demands

## Results

- 9% increased production efficiency
- 11% decreased downtime
- Improved data integrity, operational insight, and scheduling accuracy

Better insight helps increase productivity without capital expenditures on new lines.

## Products

- Proficy Plant Applications
- iFIX HMI/SCADA
- Proficy Historian
- IGS





# Sugar Producer in Europe Maximizes Efficiency with CIMPPLICITY HMI/SCADA

Next time you add sugar to your cereal or coffee, spare a thought for this large sugar producer. The company produces more than 700,000 tons of sugar. However, the sugar season is only four months long, and the company's entire output must be produced in this very short but hectic period.



This major sugar producer in Europe has more than 10 plants. During the production season, the plants work flat-out 24 hours a day, non-stop for about four months. The company's main need during this busy production period is for maximum production efficiency which means detecting and solving any production problems as quickly and efficiently as possible. The solution was a centralized control and monitoring system with distributed control that allows a small team of only four people to maintain maximum production efficiency for 10+ remote plants without traveling.

## Enterprise-Wide Connectivity

The manager responsible for automation chose an existing plant as the headquarters for all maintenance services. Because in most of the plants all the automation systems

are already connected to supervisory systems via a LAN, the natural evolution has been to extend the existing LAN on a geographic level. So they installed a WAN (wide area network) with this plant as the main node. As a result, all data acquired by supervisory systems as well as functional or diagnostic data from the control system is available to the maintenance personnel at the centralized location, so they can verify and know in advance the status of each plant, without the need to physically travel to each site.

## Enabling Centralized Motoring and Control

All the plants are connected via the network to the main plant's control center. In each plant, the existing systems are connected to this network. The PLCs at each plant are equipped with Ethernet, and the supervisory system, based

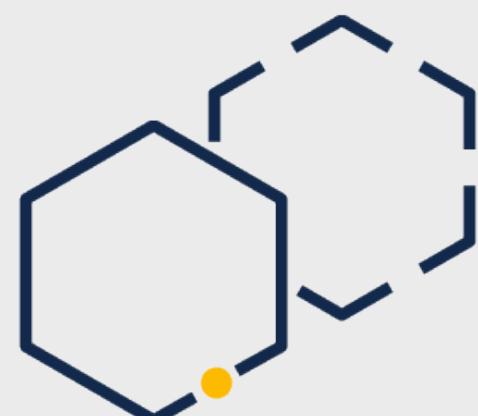
on CIMPACT HMI/SCADA, exchanges data with the PLCs using standard protocols. All this data is available at the control center. The use of standard technologies together with CIMPACT HMI/SCADA's client/server structure resulted in a distributed and fully integrated architecture without the need for any customized software development. Equally important was that this important goal was achieved directly by the company technicians without any external support.

## Time Savings and Higher Efficiency

In the two years since the beginning of this project, the benefits resulting from this centralized approach are well proven, and the same philosophy is being applied to all new or revamped plants within the company. Maintenance technicians can view all screens originating from different

plants using CIMPACT HMI/SCADA, and development tools allow them to modify both screens and configurations on every CIMPACT server from the main center.

Most importantly, this high level of control and monitoring has been achieved without the need to travel to plants and in real time. The overall result is a substantial time saving and an even better use of human resources. The company's 10+ plants can be maintained by only four people - thanks to the CIMPACT HMI/SCADA and the distributed solution.





# Global brewer increases capacity while reducing costs



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## Challenges:

- Downtime and waste
- Losses and cycle inefficiencies
- Inability to monitor and analyze variations between brew streams

## Results

- *10%-15% improved OEE*
- *3%-5% increased yield at seven breweries due to reduced process variations*
- *Automated identification and analysis of top reasons for downtime*



Proficy improves process consistency and uptime across lines and plants.

## Products

- Proficy Plant Applications
- iFIX HMI/SCADA
- Proficy Historian
- Proficy Workflow
- IGS





# Global Pet Food Processor Improves Quality and Yield



## Challenges

- Multi-plant manufacturer with lack of tools to understand what was happening on the plant floor
- Quality data entered on spreadsheets and operator logs leading to information gaps and errors
- Opportunity to improve system quality and efficiency

## Results

- Operators able to make decisions based on real-time data and input information at the point of production
- Increased uptime, reliability and productivity
- Visibility to quality data by SKU enabled formula adjustments that resulted in cost savings of \$0.01 per case on one SKU
- The ability to make data driven process adjustments resulted in a cost reduction of more than **\$200,000 per year on one SKU in one plant**

## Products

- iFIX HMI/SCADA
- Proficy Historian
- Proficy Plant Applications
- Proficy Webspace
- IGS
- GE Digital's Professional Services





# The J.M. Smucker Company

Harvests value from data to drive process & people changes



# Summary

## J.M. Smucker Company

### Solutions

- Production Management: efficiency, quality, traceability, and more
- Enterprise- and plant-wide monitoring, visibility, and control
- Industrial data management with enterprise-/plant-wide historian

### Products from GE Digital

- Proficy Plant Applications
- iFIX HMI/SCADA
- Proficy Historian
- Proficy Workflow



### Big Wins

- Saved \$500,000 a year by reducing product overfill at pet food facilities
- Expanded Uncrustables production capacity through error recognition & reduction
- Data flowing to senior-level leaders is highly relevant; no longer outdated

The J.M. Smucker Company was founded in 1897 when Jerome Monroe (J.M.) Smucker created his first product, apple butter, in Orrville, Ohio.

Guided by a vision to engage, delight, and inspire consumers through trusted food and beverage brands that bring joy throughout their lives, Smucker has grown to be a well-respected North American marketer and manufacturer.

The Fortune 500 company's brands spans pet food and pet snacks, coffee, and consumer food and natural beverage.

### **Two years ago, Smucker's didn't have a data analytics group.**

Now it has a team of four focused on how to harvest value from all the data consolidated from its production facilities. What changed? Smucker's leadership recognized the huge potential of harnessing big data to dig into production challenges such as product overfill, hidden plant capacity and equipment downtime. Plus, IS Operations colleagues John Baier and Kevin Briggs were willing to "pick a fight" by suggesting data analytics and visuals could produce real savings for Smucker's.

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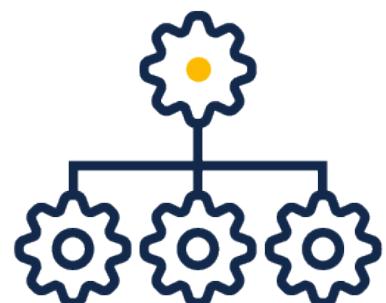
*"We have the largest data set in the entire company, our operations data. How do you leverage that information so you can take action?" said Baier, the Senior Manager of IS Operations at Smucker's.*

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### **The Challenges**

Smucker's wanted to enable a near real-time flow of information to facility operators to optimize production and spread the opportunity to make strategic adjustments from senior leaders to plant floor professionals.

Some adjustments require hours to flow through a production system. Other processes occur in batches, meaning the sooner a negative data trend is spotted, the fewer batches get rejected. Fine-tuning Smucker's ability to target hot spots and act quickly has been a focus for Baier's team. Baier said Smucker's has made huge strides in making that data available, but it still contends with messy data—data that doesn't accurately reflect production realities or is incomplete.



*"We dabbled in a small portion of the business and saved \$500,000. If we keep getting organized around that, we can save even more."*

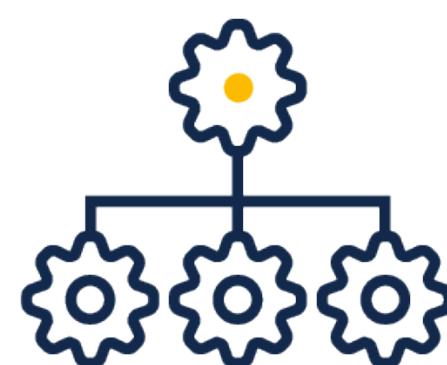
**— Baier, the Senior Manager of IS Operations at Smucker's.**



## The Solutions

“GrayMatter was one of our key partners,” Baier said. “Our leadership trusted the IS organization enough to say, ‘You guys have a right to be at the table and speak,’” Baier said. “And we’re now into a phase where the business is saying, I want to do reliability acceleration for fiscal 2020.” Baier said Smucker’s has been able to build out its capabilities to spot issues and address them. Company leaders have also asked for those capabilities to be ready on Day 1 of a new facility that’s opening soon.

GrayMatter, a GE Digital partner, collaborated with Smucker’s to enhance its MES capabilities and equip it with powerful operations management tools that analyze data and manage fast-moving processes. Baier said Smucker’s is working to further enhance traceability of raw material that enters a facility, is transformed into a product and then leaves a facility. *“It’s been an interesting two-year journey,”* Baier said. This year, Smucker’s IS Operations team—the one that didn’t exist two years ago—earned an Innovation Award for its business operation analytics.





# Leading juice manufacturer increases production efficiency



# Background

- Leading juice manufacturer with 100+ year history
- Private label, shelf-stable beverages
- Processing and bottling in plants across the US
- 100+ blends of juices
- Private-label products in major grocery, warehouse, drug stores and more

*Proficy improves running efficiency, quality and production flexibility.*

## Challenges

- Packaging materials direct losses of 1%
- Raw material direct losses of 1% and process variance-driven raw losses of 4%
- Labor losses and downtime
- Lack of insight into line stoppages, defects and waste

## Products

- Proficy Plant Applications
- iFIX HMI/SCADA
- Proficy Webspace

## Results

- 3.1 % higher average plant line efficiency in first five months
- 157% internal rate of return (IRR) for pilot
- Increased line efficiency and optimization
- Reduced downtime and waste
- Improved production flexibility

## Why this Juice Manufacturer Chose Proficy Plant Applications

- Compatible with our Networking, PLCs, ERP, Security, Support
- Easily Expanded - SPC, Lot Traceability, Maintenance
- Easily Scaled Up to Plant and Enterprise Levels
- Vendor Program fit our Change Philosophy
- Attractive Licensing Model
- Low Risk, Incremental Implementation
- Performance Pilot Implemented Quickly, Delivered Immediate Results, Did Not Limit System Growth





# Major food manufacturer harvests low-hanging fruit with digital tools

The charge into modern food processing



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**The Process Engineering Manager at a major food manufacturer** began his presentation at the GE Digital users conference with an apology for his “ridiculous” accent. But within a few minutes of his detailing the digitalization efforts he spearheads, any preconceived notions about this fruit processing guy and his funny way of speaking were squashed.

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## He's doing smart things.



An agricultural cooperative with nearly a dozen manufacturing plants that produces beverages and fruit snacks, this major fruit processing company has enjoyed massive growth over the past decade, now processing 200 million pounds annually, producing 75 million pounds of dried, sweetened fruit (up from 10 million pounds just a few years ago).

The Process Engineering Manager works out of a plant in the United States. “It’s the largest fruit-processing plant in the universe. At least I think that’s true,” he said with a chuckle.

Like many companies, the team is on the road to digital transformation. The plant uses iFIX from GE Digital for its HMI/SCADA. The system includes more than 70 iFIX clients and collects data from more than 50 PLCs and 300 variable frequency drives. The company also adopted GE Digital’s Proficy Plant Applications software to monitor performance and capabilities with their dried fruit-packaging machines. “We were focused on improving overall equipment effectiveness (OEE) using the software’s efficiency management module,” he explained.



To implement Proficy Plant Applications and go beyond their existing iFIX HMI/SCADA system, the fruit processor worked with a controls system integrator, who was responsible for putting together a turn-key solution with support from AutomaTech, a GE Digital partner. The manufacturer had a small implementation team responsible for guidance on the solution.

### Results

- Decreased downtime
- Greater insight on machine uptime
- Improved visibility into performance metrics
- Increased cross-team collaboration
- Digital tools to facilitate year-over-year growth

# Overcoming Challenges

Throughout the process, the team learned valuable lessons. Among them, cross-team input is critical.

*“Looking back, we recognized how engineers weren’t fully represented in the initiative,”* the process engineering manager said. *“And three-fourths of the team was IT who didn’t understand the key outputs we wanted to measure.”*

The team also learned that partial successes were, at the end of the day, still successes. *“We got hung up on trying to find a 100% solution. Trying to solve every situation. We realized we needed to start by going after low-hanging fruit.”*

## A Virtuous Cycle

To initiate a series of successes, the company focused on throughput—processing more pounds of fruit every day. He led weekly meetings to focus the team’s efforts and maintain commitment to the strategy. He developed a model in Proficy Plant Applications to map the entire production process. He utilized the iFIX add-in to generate custom SQL reports.

And...sure enough...the data began driving improvements. The team discovered excessive downtime on conveyer lines, which was quickly remedied by changing the loading process. His team developed greater insights on machine uptime. Soon enough, a funny thing happened among coworkers—they began developing what the process engineering manager labels metric curiosity. *“They wanted*

*to see the data. They wanted this enhanced visualization so operators would get more interested in their performance.”*

Wins prompted buy-in, which prompted more wins, which is reflected in year-over-year growth.

Currently, according to the manager, the company is processing 75 millions pounds of fruit per year. It’s impossible to maintain the growth they’ve experienced in recent years, so the collective is looking internally to

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*“Let operations know that this is a project for the whole plant, and they’re going to play a role in that.”* The process engineering manager discussed the company’s use of GE Digital tools to ramp up OEE at its plant in the United States.

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determine how to make processes more efficient courtesy of digital tools. Automated efforts mean that resources are freed up to explore ways to *“do what we do better.”*

One target—modernizing electronic data capture. With the current machine-failure-monitoring system, supervisors write the cause of failure on a whiteboard, photograph the board at the end of the day, then email that image to the group. The process engineering manager knows there’s a better, digital solution.

*“I am excited to make that happen for our company,”* he said. That sounds pretty smart, no matter how you say it.

## Lessons learned

Throughout the adoption and implementation process, the team learned some lessons:

- When possible, stick with an out-of-the-box solution.
- Get alignment and buy-in from stakeholders. Clarify who needs the data and what roles and responsibilities team members have related to it. *“Let operations know that this is a project for the whole plant and they’re going to play a role in that.”*
- Good data is critical to success. *“It sounds simple, but people often need to be trained to develop usable data.”* (Avoid the “garbage in, garbage out” quandary.)
- Share the tools early in the process. Make data easily accessible.
- Don’t overcomplicate the solution. *“There are times when 95% is better than trying to be 100%.”*



# North American Brewer sees millions in energy cost savings with Proficy

Visibility into consumption details drives energy conservation processes and culture





## Challenges

- Rising utility costs and common energy utilization metrics
- Delivery of timely energy information
- 5-year energy target of \$10 million cost reduction

## Results

- Surpassed energy target and achieved 10-15% improvements year over year
- Significantly improved energy conservation
- Multi-level reporting by utility (Electricity, gas/oil, water, steam, ammonia, CO<sub>2</sub>, etc.)

## Products

- Proficy Plant Applications
- iFIX HMI/SCADA
- Proficy Historian
- IGS



# T. Marzetti

Saves Millions with Digital Transformation



# Manufacturing Execution System (MES) Solution

- Proficy Plant Applications
- Proficy Historian
- Industrial Gateway Server (IGS)



Predictive analytics and connected kitchens unlocked millions of dollars in savings at specialty food producer, T. Marzetti Company. T. Marzetti Company, a subsidiary of Lancaster Colony Corp., is based in Westerville, Ohio.

Marzetti began in 1896 when Teresa Marzetti, an immigrant from Florence, Italy, opened a small Italian restaurant in Columbus, Ohio, which grew into a four-star dining establishment with an upstairs factory that produced the restaurant's popular salad dressings.

## At Marzetti, data analysis wasn't part of the routine.

Information wasn't easy to find and standards for relating data to its supply chain didn't exist.

Beginning with a single plant in Kentucky, GrayMatter, a GE Digital partner, recommended digitizing data connectivity

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*The goal is to help Marzetti view its operations in new, compelling ways.*

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among key floor assets and then contextualizing the data gathered so they could be used to accelerate the Marzetti Operational Excellence (MOE) initiative.

Organizationally, most of the decision-making was confined to a few key leaders at the company.

Marzetti sought GrayMatter's help because executives said they wanted to build on the company's success and

reputation around products including health-conscious salad dressings, dips, bread and products for restaurant chains such as Chick-fil-A and Olive Garden.

Empowering more employees to improve the business was among the major, early initiatives to emerge from Marzetti's partnership with GrayMatter.

For the first time, people at all levels of the company had the connected, data-driven tools to spot opportunities to improve efficiency that might have otherwise gone unnoticed.

## Digital Roadmap

Key statistics from GrayMatter's analysis of Marzetti's plant in Horse Cave, Kentucky revealed major opportunities to eliminate waste and save money.

One involved overfill. For every 100 pounds of packaged product, about four pounds were being given away for free because packages were being overfilled.

Those tiny, excess amounts of sauces, dips and dressings were escaping as stowaways.

Over time, it added up to large quantities.

**Based on data insights, the following recommendations came into focus:**

- Reducing variability and identifying reasons for overfill to improve material utilization
- Improving coordination and understanding of upstream delays that impact packaging
- Eliminating manual data entry practices that produced a misleading perception of plant performance

Marzetti provided GrayMatter access to electronic data from its cryovacs, machines that seal food in airtight packaging; checkweighers, which weigh packaged products without needing to pause a conveyor belt carrying products; and kitchens.

GrayMatter created a digital model or twin of the flow of products through the plant including raw materials, batching and packaging.

Once the new system was configured, GrayMatter began having daily meetings with Marzetti employees onsite to track operations as the system monitored raw materials, batching in the kitchens, storage tank levels and packaging.

It also tracked activities including employee crew configurations and shift schedules, process orders, product runs, batches and production intervals, downtime and waste.

The system enables performance comparisons by product code, equipment, order, reason and other contexts. It automatically emails personnel when exceptions are detected.

### **Among other insights, the daily review helped reveal how overfills increase during restarts.**

The system began comparing the accuracy of fills during the “restart” period to when the filling system was at “cruising speed.”

GrayMatter provided GE Digital's MES (manufacturing execution system) solution featuring Proficy Plant Applications and Proficy Historian as well as the expertise to digitize their operational excellence program, and Marzetti made the necessary adjustments to take advantage of what the data revealed.

### **The Savings**

Marzetti has saved millions of dollars a year at just one of its facilities and anticipates that the savings could grow three-to-four-fold when the improvement program is expanded to other facilities, which Marzetti plans to do.

The initial success has come from reducing the amount of product waste by 50 percent or more.

*“Now we’re trying to be more proactive with the planning – making data available across the supply chain is a big deal, and I think we’re at the very beginning.”*

**— Jeff Woodard, T. Marzetti, VP of Operations**



# A Note

From T. Marzetti

**By Jeff Woodard,  
VP of Operational Excellence, T. Marzetti**

Marzetti continues to benefit from lighting up and digitizing their supply chains. Expanding visibility across our supply chain and making waste and losses more visible continues to add value to our bottom line.

Pilot project learnings that began a little over a year ago are being reapplied in numerous areas. The visibility of data is empowering our people to help us become the *Better Food Company*.

**We're able to make better decisions every day.**



## Electronic log sheets with statistical tools are helping to create better problem-solving teams on the factory floor every day.

The integration of better tools with passionate leaders equipped with problem-solving skills, like our lean Six Sigma program black belts, are helping to grow our capability to incorporate continuous improvement as a natural expectation within our culture.

I'm not saying we are there. But I am saying seeds are being planted, and soil is being tilled.

Benefits from better weight control have enabled learnings for broader use of the tool while delivering savings to the bottom line well within the first year of deployment.

The cross-functional teams within Marzetti and strong partnership with GrayMatter have created strong project teams to engage aggressive deployment and reapplication schedules.

Cross-functional teams are highlighting duplicity of work between departments that can be consolidated and thus simplify the role of the associates by sharing electronic log sheets on work stations.

Building self-sufficient teams with great leaders and problem-solving tools is critical to our mission of becoming the Better Food Company.

I continue to be reminded that equipping and coaching our organization as a leader is a big part of my role to ensure the success of our company. Our people are hungry for coaching and development. Everyone wants to play with the belief and intent to win every day. It's our job to provide the environment and foundation for those daily wins.





# UK Brewery Automates Beer Production



# Overview

For 150+ years, this major brewery has been producing some of the UK's best known traditional beers. The brewery upgraded their plant with a new automation solution from GE, featuring CIMPACT HMI/SCADA for its supervisory control system complete with touch screen control.

The system has resulted in many benefits including higher productivity, easier upgrading to meet changing production requirements, higher reliability with improved diagnostics and improved management reporting.

## Modernizing Brewery Operations

This UK brewer decided to replace an older system developed over many years to control post-brewing processes such as Cleaning-in-Place, chilling, pasteurization, storage holding, bottling, filling large metal kegs and deliveries by road tanker to customers. The old system was increasingly difficult to support and upgrade to meet new production requirements.

Also, specialist support was required to maintain the system. Therefore, the company set about looking for a modern solution that would be well supported by a worldwide company both now and well into the future, easy to configure, and capable of upgrading to meet future requirements.

To find a solution, the company approached GE whose integration partner proposed a new integrated solution meeting all requirements. The resulting system allows data

integration with business systems for management reports and production schedules. The system can be switched to full manual control whenever required.

As a supervisory solution, the CIMPACT system monitors and controls all the valves and pumps as well as tank levels and the temperature of the holding tanks, the pasteurising and filtering processes plus final transfer to tanker loading or keg/casking processes. GE's CIMPACT HMI/SCADA, paired with touch screen operator interfaces, was found to be the best way to provide user-friendly control. Operators can use the CIMPACT touch control screen or conventional keyboard to quickly see the status of all parts of the plant and make changes to the procedures. CIMPACT also provided an ideal way to link the company's plant floor system into its management information system.

The status of every part of the process is displayed on a large mimic display in the control room giving a continuous update of progress. Alarms programmed into the system warn of any problems while all actions are recorded.

Following the success of the system, the brewer has already decided to extend to include existing flow and temperature measuring systems for accurate and cost-effective flow rate and temperature monitoring.

*"With the GE system, we now have a very versatile system based on industry standard SCADA software from a global automation leader, so support and upgrading is no longer a problem,"*

*—explained the brewery's Chief Engineer*

## Products

- CIMPACT HMI/SCADA
- Proficy Historian
- IGS





## About GE

GE (NYSE: GE) is the world's Digital Industrial Company, transforming industry with software-defined machines and solutions that are connected, responsive and predictive. GE is organized around a global exchange of knowledge, the "GE Store," through which each business shares and accesses the same technology, markets, structure and intellect. Each invention further fuels innovation and application across our industrial sectors. With people, services, technology and scale, GE delivers better outcomes for customers by speaking the language of industry.

## Contact Information

[www.ge.com/digital](http://www.ge.com/digital)