

Manufacturing Analytics to improve Quality and Utility Costs

Utilizing existing architectures and modern AI/ML tools; improving First Pass Quality by utilizing process (time series), manufacturing (event) data, and continuous analytics to **reduce utility costs** and **optimize process**.

10-15%

in first pass quality gains

5%

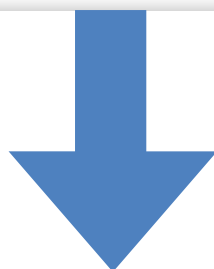
waste reduction

10%

product downgrading

10-15%

utility savings



Significantly
Reduced
Schedule Upsets

HIGHLIGHTS

Challenge

Looking for the optimal way to roast their products. The current method of monitoring resulted with a lot of product in process. Wanted **good quality product at the lowest cost.**

Solution

Current Historian and MES in place with years of data. **Added several sensors like temperature, humidity, and others.** Combined with the quality results, it was sent to a data scientist who was able to model the data and give the models back to the plant so they could **predict product quality.**

Results

System delivered **10-15% in first pass quality gains**, which **reduced waste by 5%**, **product downgrading by 10%**, and **significantly reduced** schedule upsets. Eventually **utility savings of 10-15%** were realized.

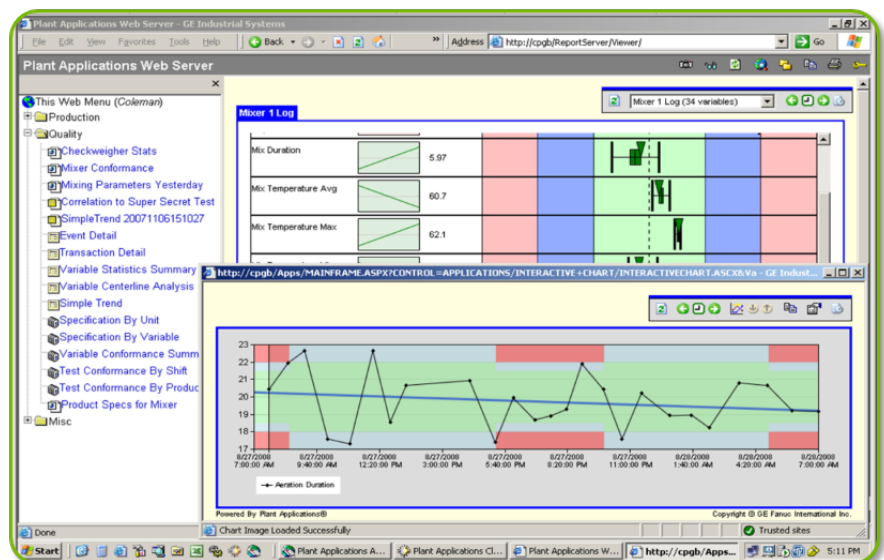
The Company

Algood Food Company knows peanut butter. Their primary product was private label peanut butter back in 1985 (when they started business). They were the first private label peanut butter manufacturer to convert from glass to PET jars, introduce PB&J stripe in a P.E.T. container, and many other innovations. In 2002, the peanut butter plant was moved to a brand new, single story, 100,000 sq ft building located in the Riverport Section of Louisville, Kentucky.

Since Algood has been roasting products for years, their process had become fairly optimized. However, they wanted to enhance the way they roasted their peanuts. The process involved the Operators and the Quality Department working together. The Quality Department took samples, tested them, and provided results for the operators to work towards improving the process.

“ Most good manufacturing solutions, start with a gut feel. They are proven (or not) with data, and then optimized with analytics.

-Plant Manager



The Challenge

Based on quality specs, the peanuts would be stored in various inventory locations and the schedulers would schedule to use the available peanuts. This was a pretty standard operation and it worked well. When products of the right quality were not available for a desired production order it would force them to hurry and make it. Often, peanuts were wasted as they were not usable.

It was about getting access to more data. Algood implemented more Programmable Logic Controllers (PLCs), Human Machine Interfaces (HMIs), time series Historians, and a variety of sensors like temperature and humidity to gather more data. Process setpoints and alarms were places so that operators could better control the process.

Quality tests were logged into a database. Algood implemented integration for the schedule, Bill of Materials (BOM), consumption of materials, track and trace into an overall production database, and their (Enterprise Resource Planning (ERP) system. With an increased amount of data providing more visibility, they were able to find improvements for quality and scheduling. But they knew they could do better.

A main issue was that peanuts spent overtime in the roaster resulting in changes that affected the product. Additionally, due to the length of the quality check, incorrect product could be made up to several shifts before any recognition for course correction to take place. Secondly, roasting peanuts could be affected by uncontrollable variables like humidity, outside temperature changes, and product variability like moisture content. With these changes, the roaster would be impacted but only process variables like burner levels, belt speeds, and air flow could be controlled.

01

**BREAK / FIX - AFTER THE FACT LAB TESTS
WHAT HAPPENED?**

02

**REACTIVE - CHECK QUALITY AT THE LINE IN
NEAR REAL-TIME: WHAT IS HAPPENING NOW?**

03

**PROACTIVE - PROCESS MODELING TO
PREDICT QUALITY: WHAT COULD HAPPEN?**

04

**PRESCRIPTIVE - MODELS TO FIX PROBLEM
BEFORE IT EVER HAPPENS: WHAT SHOULD HAPPEN?**

Our Solution

Algood had access to almost every process parameter (controllable and non-controllable), quality results for each lot, used raw material with lab results, and knowledge of variables affecting the process. By having a data scientist analyze the data, they were provided with models that could be optimized over time allowing them to “predict” the end color of the product. With operators trained on necessary adjustments, prescriptive analytics could be automated.

The key was collecting the process data and other sensors in a time series data structure, collecting quality and manufacturing data in an event database. From there, applying some data analytics (human and computer) with process knowledge to solve problems and work towards significant business results.



For Manufacturing Analytics, it is critical to have years of raw data before you know what issue you are trying solve or optimize.

- Kelly Forbes, VP Operations

Results

With the benefits of gaining access to more data for decision-making, Algood was able to realize impactful changes to their business performance. First-pass quality gains were up 10-15% , product downgrading changed by 10%, and they reduced waste by 5%. Schedule upsets were significantly reduce and they realized utility savings of 10%-15%.



INS3 Tip

Not sure where to start? Start by collecting the time and event series data. Analytics run best with a lot of correlated data and you never know the variable that will be the most important. Or if you've got questions, let us help.

About Us

30+

years in business helping our customers solve efficiency, quality and cost control problems.

450+

completed projects in different industries like Food and Beverage, Consumer Packaged Goods, Manufacturing and Industrial.

300+

years of combined experience in our Senior Staff, and hundreds more with our team of engineers.

