

A Recipe for Success

How Recipe Solutions Can Improve a
Company's Bottom Line



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Introduction

Today's manufacturing companies face many pressures, including rising costs for raw materials, labor, and distribution, not to mention customer demands for higher quality at lower prices. Yet these significant challenges can be used to spark new opportunities to improve the way businesses run.

Most companies' first reactions to these pressures are the same. They start a site or company-wide "improvement program" designed to cut waste and reduce variable costs. They focus on areas like waste reduction or energy efficiency programs such as an efficient lighting system to save money on the electric bill. These programs oftentimes look closely at lowering the costs of raw materials by assessing alternative suppliers. Although these can be effective programs that lead to significant savings, they tend to be outward looking and do not improve the product manufacturing process.

In essence, companies are missing some of their biggest opportunities by not reviewing the recipe area of their site: their cooking, blending, and mixing areas. These recipe areas for many companies, especially in Food & Beverage or Consumer Products, were designed more than 20 years ago—resulting in prevalent process inconsistencies mainly due to the lack of software technology.

With today's software systems, these areas can be significantly enhanced—not only to help improve the consistency from person to person or shift to shift, but also to reduce costs and transform the business as a whole.

Older recipe solutions offer very little help for ingredient changes around quality parameters, which are usually associated with new suppliers and can result in product loss. So, when Purchasing develops alternative raw material sources, the recipe area cannot tolerate the quality parameter changes associated with the new supplier — often resulting in the loss of batches until the recipe can adjust to the new supplier.

In this paper, we'll explore the use of today's recipe software solutions as a part of a control strategy to transform a company's recipe area from a place of contentious schedule adherence and "roll-of-the-dice quality" to one that can reduce waste while increasing quality to provide a consistent schedule adherence in an environment for continuous improvement.

Pressure Relief

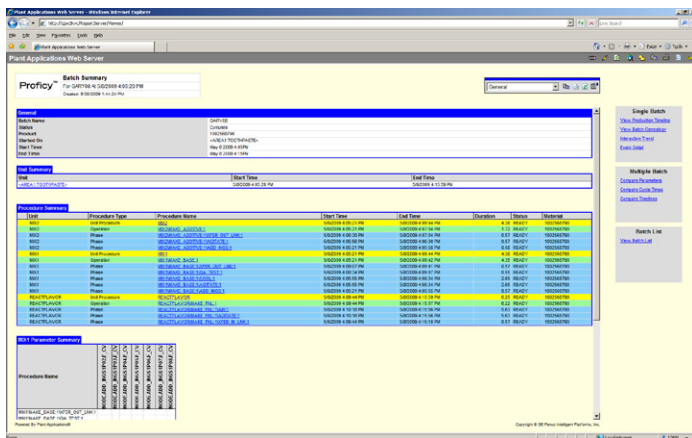
Using modern control strategies available today, companies can abandon their practice of accepting that some batches will never be made at a high enough quality to sell to customers.

For example, one company budgeted \$40,000 a quarter for batch loss. Once it modernized the recipe area of its site, it reduced its budget to \$40,000 dollars per year and never charged against that budget item—returning \$120,000 to the bottom line. The recipe solution returned more to the bottom line in its first two years than the company's next top three cost-savings programs. By also adding in software visualization components to the recipe system, it uncovered additional value that attributed to an even bigger savings when compared to just lost batches.

Moving from a traditionally unstructured approach often found in older recipe solutions to a modern structured solution that is built for data collection enabled the site to use the data collected by the system to develop consistent methods of gaining 14% higher yields from the recipes produced. The software empowered its team of operators, engineers and management to work collaboratively and identify areas of improvement – giving them quick feedback on the changes and driving a data-driven culture. With this higher yield, the company was able to introduce new products three times faster than before, and it set the quality specification of its products to be 17% tighter than past producing methods—giving them a competitive advantage that would not have been possible before.

Another major hurdle companies face is employee attrition. Whether it's through retirement, layoff or career progression, the detailed process knowledge and experience of workers that leave can also disappear. This expertise that goes out the door can significantly impact the operation and if left unchecked, can cripple the operation – affecting business long term.

For example, the department head of one company faced the advanced announcement of six out of ten recipe operators all retiring within a year of each other. He passed a comment at the team's retirement dinner that although he was sad to see the team leave, the new system gave him confidence that the department would be able to continue to work at the same high quality level, because operators were able to leave their recipe knowledge, and thus their legacy, in the new system—giving everyone peace of mind.



As shown, you can quickly review the quality of a recipe with modern recipe solutions.

High Quality / Product Flexibility

In business today, companies are increasingly operating based on two main overarching principles: deliver a quality product that customers value, and uphold the brand image. These two principles are key to success as they enable faster introduction of new products to the market without having to win over customers' trust for every product.

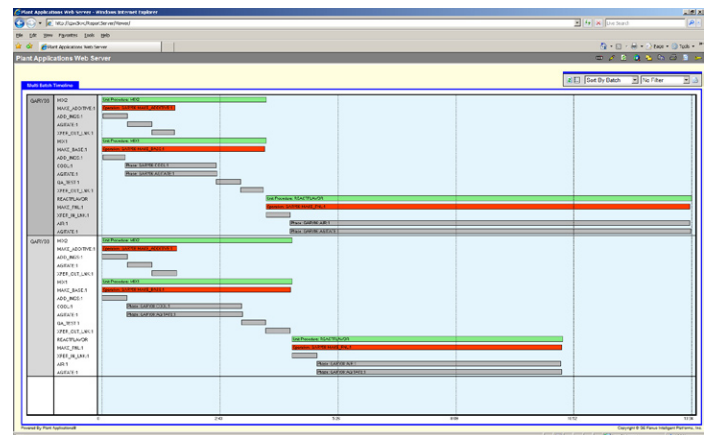
However, obtaining these objectives is becoming more difficult today because of the increasing demands caused by

normal cost pressures such as import/export regulations and the increased buying power of retailers, causing margins to become tighter.

Adding to these cost constraint pressures, the newest element in this landscape is the educated consumer. Because consumers are more technically savvy, they tend to evaluate all options for each purchase, are less brand loyal and don't assume a consistent product quality across a company or brand. This can be demonstrated by asking anyone under age 40 how they picked their last car, as the general answer will be, "I searched the Internet, went into some chat rooms, and did the research."

Today, almost overnight, products are reviewed, categorized and published for the world to consume by target audiences such as concerned moms who want the best for their new baby. This kind of instant public scrutiny leaves even the best manufacturers stressed and brings new product launches under the microscope so fast that a new product can be killed before the launch is complete.

To combat this, companies are increasing their quality and control systems funding to ensure the consistency and quality of their products. Evaluation of all aspects of the process also needs to be performed continually so that the product continues to exceed consumers' expectations. Strong, full-featured automated recipe software solutions such as GE Fanuc Intelligent Platforms' Proficiency Batch Execution are key to success, given these challenges in today's world.



Recipe-to-recipe comparisons of recipe steps point out continuous improvement opportunities.

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Continuous Improvement and Savings

Continuous improvement and cost savings go hand in hand. After all, making something better, safer, higher quality, faster, and with less waste, also reduces the cost of manufacturing.

Solutions today focus on enabling continuous improvement because they can:

- Collect data
- Report data
- Analyze data
- Visualize data

Companies that integrate recipe software solutions into their automation strategy can expect to level the ebb and flow of quality coming out of their manufacturing areas through:

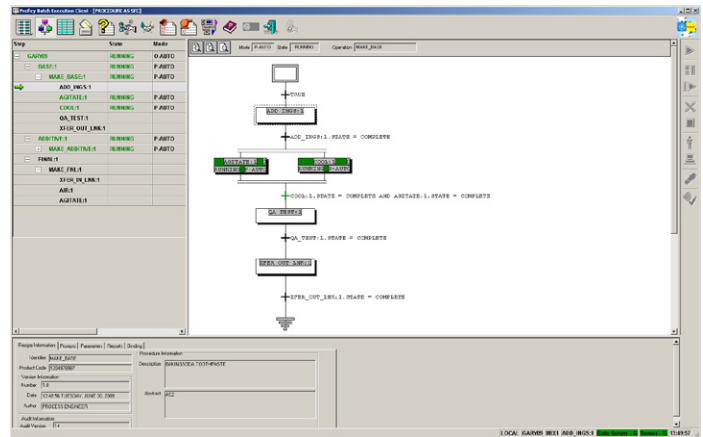
- Better recipe control
- Adjusting to raw material quality profiles
- Equipment scheduling
- Fast reporting of quality
- Full process visibility

When adding a recipe solution to a manufacturing area, oftentimes a company will look at just the immediate return on investment (ROI). ROIs for recipe solutions generally run less than two years when using even the more conservative accounting practices. The bigger payback comes from the after-installation, continuous improvements that occur when the operation team can:

- Compare recipe runs
- Analyze operation times
- Close in on key quality parameters
- Use real-time accurate data for decision making

By gaining the rich data these systems provide, the process improvement personnel in the factory can define new recipe reaction points to enable the operator to perform corrective actions long before there are quality problems. Minor adjustments on a key quality parameter as it is trending out of specification can eliminate a wasted batch or allow a team to tighten product specifications.

When under the pressure of a new product launch, the ease of a recipe solution will enable recipe execution, while collecting data and meeting tolerances. This allows launch teams to keep to their launch schedule and provides vital information to the development team on any opportunities for improvements or issues to resolve prior to launch. The result: a faster launch process that is more predictable.



Real-time visibility into the recipe process enables good recipe quality and quick adjustments.

Ensuring a Recipe Solutions Platform That Aligns With the Business Plan

Recipe solutions have long been the place where strong proponents of recipe standards such as S88 have touted their loyalty to the standards for all recipe solutions. This often resulted in confusion from people who were new to recipe solutions or just not standard gurus.

Due to the development of these standards, today's recipe solutions come in all shapes and sizes. The good ones can handle anything, from the simplest of recipes to the most complex.

Choosing a recipe solution requires not only a sound automation strategy but also a need to understand the business plan. Leaving one of these elements out will cause a company to spend more money than it needs to over the life of its factory.

For example, a decision of going with a large oversized “closed” recipe solution such as a distributed control system (DCS), could result in buying too big of a solution with limited flexibility for expanding into other areas of a facility, like packaging, which would require a programmable logic controller (PLC) automation architecture. Therefore, maintenance staff would have to know both the DCS and the PLC automation architectures; looking a little further down the line, a company would have to pay more for these dual-skilled maintenance employees, which would make recruiting efforts harder and ultimately increase operational costs.

However, if the company aligns its automation control platform to satisfy both manufacturing areas, it would not only gain the ease of finding the right maintenance people to support it, but would also reduce the total cost of ownership by reducing training, spare parts, and time to solution for troubleshooting.

Business plans and automation strategies that are tied together provide the best perspective on where a company’s capital should be focused while allowing the best possible “bang for the automation buck.” Recipe software solutions, as part of the plan, enable the development of a platform based on the need for flexible, high quality manufacturing.

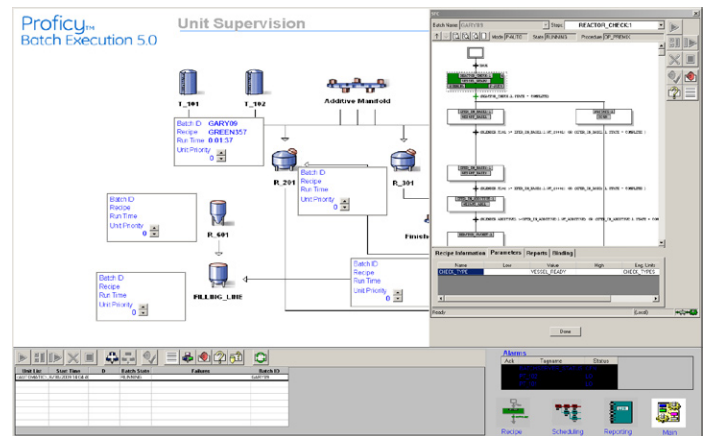
Modeling

To understand recipe modeling, one only needs to pick up the nearest cookbook. In it, there are hundreds of examples of recipe models. The simplest cake recipe has a defined model of raw materials, for example, with healthy optional raw materials to cut down on calories. Additionally, there are implied equipment requirements, like a mixing bowl, or a blender and an oven. Together, these components form a simplified model for recipe execution, complete with step-by-step instructions.

Solutions for manufacturing, thanks again to those strong proponents of recipe standards such as S88, provide us with easy-to-use modeling for:

- Equipment
- Schedule
- Compliance

By creating this model, the recipe system can quickly change the size of the recipe, ensuring the equipment is appropriate for use and resolving schedule conflicts before they show up on the factory floor. This results in better use of equipment, labor and raw materials, and a faster process for compliance.



An operator can easily access a dashboard with recipe information and control at his or her fingertips.

Equipment Utilization Made Easy

Perhaps the biggest advantage associated with modern recipe solutions is the ease with which they can ensure proper equipment utilization, allowing operations to run more of their recipes through the same equipment.

Equipment is identified not only by location, but also with regards to its capabilities to execute key activities in the recipe. For example, a recipe could be made in any one of several blenders, but only two of them best fit the current

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recipe size. Diving deeper into equipment utilization, a good recipe software solution can also look at the time each of these blenders have been operating and move the recipe to the blender that has worked the least amount of hours. Thus, it helps save on maintenance repairs by balancing the workload among the existing equipment.

In one company, a recipe solution was installed to provide the ability to run two recipes simultaneously through the same pieces of equipment by using equipment allocations. After fine tuning these equipment allocations, the company was able to add another recipe into the equipment stream—resulting in three recipes on one shift, and it eliminated the need for a third shift altogether.

The ability to associate recipes to pieces of equipment can optimize the use of parallel pieces of equipment, allowing recipes to move quickly across traditional straight-line production solutions.

Conclusion

Companies today have more pressure than ever before to outperform last week's best efforts and reduce costs. This increased focus on the bottom line for quality, speed to market and cost reductions can be just the kind of opportunity a company needs to start thinking about better ways to produce products—and recipe software solutions are the answer.

By following today's modern recipe structured solutions, a company can gain more consistencies and higher quality within the recipe area, while experiencing higher yields. It will have a faster and more repeatable recipe execution than its current process, and the solution's ease of use will help the operations team with equipment troubleshooting and automated equipment balancing that allows a company to get the most out of its factory.

By developing sound business-driven automation strategies that include a good recipe system, manufacturing of recipe-driven products can accelerate a company's speed to market, increase its quality and help it gain the loyalty of savvy customers.

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Additional Resources

For more information, please visit the
GE Fanuc Intelligent Platforms web site at:

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