ECS SOLUTIONS INC.

BARDSTOWN BOURBON COMPANY CASE STUDY

THE CHALLENGE

Bardstown Bourbon Company (BBC) is a Bourbon Distillery located in Bardstown Kentucky. Utilizing two mash cookers, 32 fermenters, two distillation stills and nine cistern holding tanks, BBC produces a wide variety of high-quality whiskeys and bourbons.

ECS Solutions upgraded BBC's existing HMI system from a C-More application to an Ignition application. The previous application had limited flexibility in terms of data collection, process history, and licensing structure. The major challenge was delivering a customized solution that utilized new technologies while also creating an architecture that could adapt to the end user's changing needs.

THE SOLUTION

The end user chose Inductive Automation's Ignition as the new solution platform because Ignition allows for a more complete integration process. Specifically, Ignition provides a way to communicate with the existing ERP system, presents a work order request webpage to the operators without requiring them to load a separate application, implements a custom Batch Tracking system, and leverages mobile ready screens using Ignition's Perspective Module.

The new Ignition screens mimic the behavior and actions of the previous screens while also providing new features and improvements. Several new screens providing ad hoc historical trending and batch tracking were added, as well as ECS' own Ignition compatible DVR playback module. The DVR playback module allows historical information from the process to be played back on the screens to highlight and troubleshoot process issues. This playback is extremely helpful in visualizing historical data that would otherwise be cumbersome to fully utilize.

The batch tracking system allows for the tracking of batches from mash cooker to cistern. Batch data is collected and logged automatically by Ignition as PLC sequences are executed.
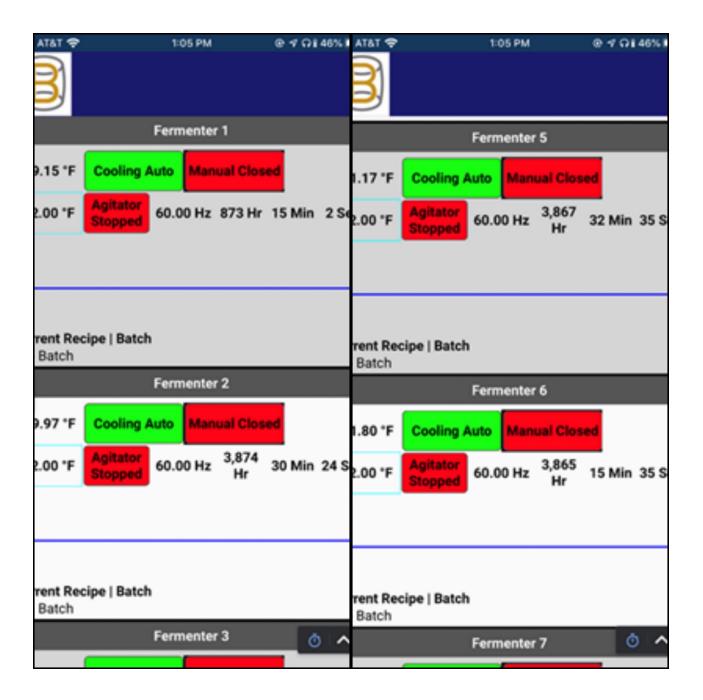
BARDSTWON BOURBON

For example, as grains are added into the Mash Cooker, the final delivery weight is captured and recorded into the Batch Tracking database. When a batch is moved into a cistern, it is electronically linked to a "superbatch" consisting of several batches. Ignition facilitates the collection and processing of all events (both manual and automated) related to a batch, logging them to a custom designed database for future reference and reporting.

A mobile component was implemented as part of the Ignition system to extend visibility to supervisors and management. The mobile screens for this project are developed as a "read only" viewport into the plant. The main screens consolidate information about the distillery's fermenters. Each row provides a summary of current fermenter status, including temperature, agitation status, and batch time. Ignition's Perspective Module allowed ECS to create displays that work on a variety of devices and screen sizes, by leveraging responsive design.

On a large screen device such as a PC, the information is laid out in table structure. This is a more typical layout familiar to operators. They can tell at glance how the fermenters are behaving and how the current batch is running.

Ferm 1	89.15 °F	Cooling Auto	Manual Closed	92.00 °F	Agitator Stopped	60.00 Hz	873 Hr	15 Min	2 Sec		Current Recipe | Batch No Batch
Ferm 2	89.97 °F	Cooling Auto	Manual Closed	92.00 °F	Agitator Stopped	60.00 Hz	3,874 Hr	24 Min	52 Sec		Current Recipe | Batch No Batch
Ferm 3	90.42 °F	Cooling Auto	Manual Closed	92.00 °F	Agitator Stopped	60.00 Hz	3,871 Hr	59 Min	52 Sec		Current Recipe | Batch No Batch
Ferm 4	91.35 °F	Cooling Auto	Manual Closed	92.00 °F	Agitator Stopped	60.00 Hz	3,869 Hr	45 Min	52 Sec		Current Recipe | Batch No Batch
Ferm 5	91.17 °F	Cooling Auto	Manual Closed	92.00 °F	Agitator Stopped	60.00 Hz	3,867 Hr	26 Min	52 Sec		Current Recipe | Batch No Batch
Ferm 6	91.80 °F	Cooling Auto	Manual Closed	92.00 °F	Agitator Stopped	60.00 Hz	3,865 Hr	9 Min	52 Sec		Current Recipe | Batch No Batch
Ferm 7	91.35 °F	Cooling Auto	Manual Closed	92.00 °F	Agitator Stopped	60.00 Hz	3,862 Hr	46 Min	52 Sec		Current Recipe | Batch No Batch
Ferm 8	91.47 °F	Cooling Auto	Manual Closed	92.00 °F	Agitator Stopped	60.00 Hz	3,860 Hr	14 Min	52 Sec		Current Recipe | Batch No Batch
Ferm 9	91.40 °F	Cooling Auto	Manual Closed	92.00 °F	Agitator Stopped	60.00 Hz	3,857 Hr	45 Min	51 Sec		Current Recipe | Batch No Batch
Ferm 10	91.70 °F	Cooling Auto	Manual Closed	92.00 °F	Agitator Stopped	60.00 Hz	3,855 Hr	16 Min	52 Sec		Current Recipe | Batch No Batch
Ferm 11	91.50 °F	Cooling Auto	Manual Closed	92.00 °F	Agitator Stopped	60.00 Hz	3,852 Hr	46 Min	52 Sec		Current Recipe | Batch No Batch
Ferm 12	91.70 °F	Cooling Auto	Manual Closed	92.00 °F	Agitator Stopped	60.00 Hz	3,850 Hr	14 Min	52 Sec		Current Recipe | Batch No Batch
Ferm 13	91.90 °F	Cooling Auto	Manual Closed	92.00 °F	Agitator Stopped	60.00 Hz	3,847 Hr	30 Min	52 Sec		Current Recipe | Batch No Batch
Ferm 14	91.90 °F	Cooling Auto	Manual Closed	92.00 °F	Agitator Stopped	60.00 Hz	3,845 Hr	19 Min	52 Sec		Current Recipe | Batch No Batch
Ferm 15	91.90 °F	Cooling Auto	Manual Closed	92.00 °F	Agitator Stopped	60.00 Hz	3,842 Hr	43 Min	52 Sec		Current Recipe | Batch No Batch
Ferm 16	91.50 °F	Cooling Auto	Manual Closed	92.00 °F	Agitator Stopped	60.00 Hz	3,839 Hr	59 Min	52 Sec		Current Recipe | Batch No Batch
Ferm 17	91.58 °F	Cooling Auto	Manual Closed	92.00 °F	Agitator Stopped	60.00 Hz	3,837 Hr	42 Min	52 Sec		Current Recipe | Batch No Batch

On a mobile device, the information shifts into a card layout structure. This provides a way to view the information that is intuitive to any smartphone user. The data is organized in blocks for each fermenter rather than rows. Because all blocks cannot fit on the mobile screen at once, the data is therefore scrollable. The information between fermenters is separated cleanly by the large containers creating the cards. A few quick gestures can provide the user with the information they need. Bardstown Plant Engineer, Roger Henley shared that, **"The entire project moved smoothly, even though we were blazing new ground".**

THE RESULT

This solution provided a live and historical view into the customer's processes. It leverages a much greater amount of historical data on all control points in the system, which allows plant leadership to make more informed decisions. The project benefits from being both centralized (project modifications are published immediately at all client stations) and easily accessible to a variety of plant personnel. Operators work with traditional HMI displays, while production managers, front office personnel, and supervisors can view the plant status from PC's and mobile devices at their convenience. The system also allows the customer to collect, store, and review their batch and recipe data consistently. At the conclusion of the project, Henley stated ,**"The ability to historize an unlimited number of data points has changed the way we do business and make decisions."**

Possible next steps for this process include the implementation of a batch sequencing engine to automate more of the customer's processes, as the current process is still primarily a manual one. The provided batch tracking system was designed to integrate well with additional process automation, should more be added in the future.

The solution provided maintains the integrity of the original HMI screens while providing additional information and tools to improve the effectiveness of the users. The system is flexible to optimize and to expand to meet BBC's continued growth.