AVEVA

New Belgium Brewing Improves Performance and Meets Customer Demands

New Belgium Brewing Co. - www.newbelgium.com
Industry - Food and Beverage

Goals

- To increase the company's ability to fully take advantage of manufacturing capabilities
- Achieve Overall Equipment Effectiveness (OEE) to produce a quality product; manage production efficiency; and ensure production line availability through scheduled downtimes, package changes, and scheduled maintenance activities
- To operate the brewery at full production capacity and double case production

Challenges

- The brewery lacked real-time information on unscheduled downtimes at various equipment areas which caused production slowdowns
- Production staff were continually reacting to unscheduled downtime at equipment areas
- Management needed to address gaps in methods and processes to drive improvements

- The bottling operation lacked the ability to predict capabilities to effectively commit brewery staff to specific production goals

Solution

- MES Performance

Results

- OEE increased from 45% to 65% in just over 2 years
- Decreased downtime by more than 50%
- Efficiency of scheduled run time increased by 25% - 30%
- Achieved record production weeks producing 190,000 to 200,000 cases consistently, successfully meeting customer demands
- Extended packaging area capacity to about 1.3 million barrels each year
- The brewery was able to delay capital investments, enabling it to maintain lower operating costs

Fort Collins, Colorado, USA – What started out as a beer brewing hobby fueled by a passion for great tasting craft brews, has turned into one of America's best multi-million dollar success stories. Producing some of the world's most popular craft brews, including Fat Tire and a multitude of other popular IPA, Pilsner, wheat beers and ales, has the folks at New Belgium Brewing Co. tapping into the world's demand for great tasting American craft brews.

So how does a company maintain its position as the nation's third largest craft brewery and eighth largest overall brewery in the U.S. since 2012? Give the people what they want — more great tasting beer. To ensure its discerning beer loving fans receive only the highest quality beverage, New Belgium implemented a series of manufacturing automation initiatives over the last five years to streamline and improve its brewing and bottling facility in northern Colorado.

"New Belgium's brewing operations were rapidly reaching capacity, and we needed to identify both efficiencies and inefficiencies in our bottling lines so the brewery could maintain its operating schedule," said Joe Herrick, packaging systems manager at New Belgium Brewing. "With such a rapid growth of our business year after year, and sometimes at a pretty fast clip, this was a good problem to have, but still a problem we needed to address."
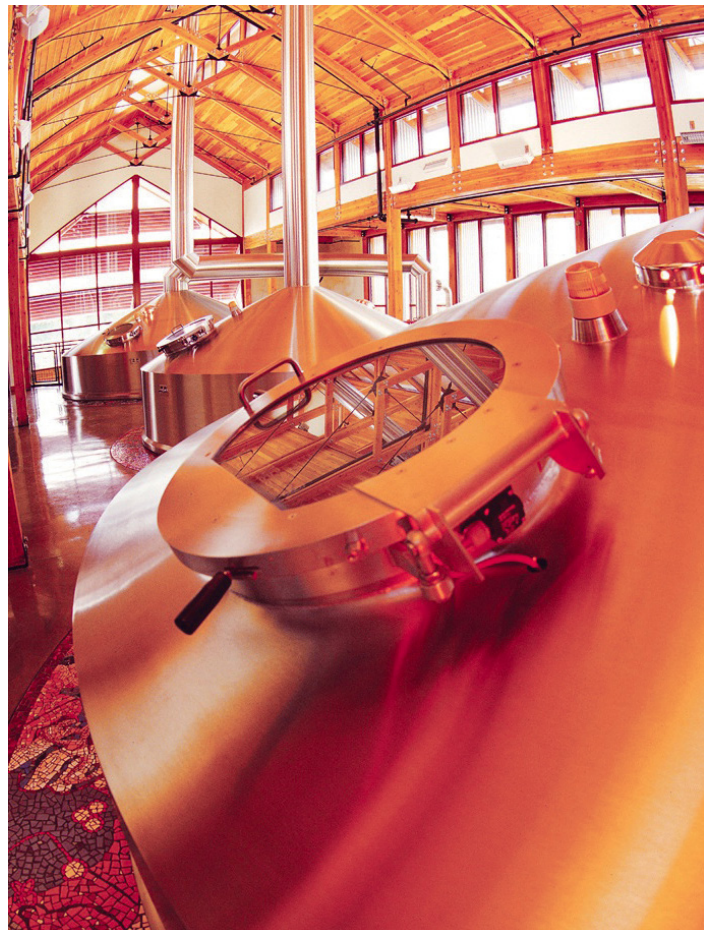
"The operations management team realised it was time to expand our current Wonderware by AVEVA automation software capabilities to take advantage of its full Manufacturing Execution System capabilities in order to find more time in the day to bottle, as well as to free up time to focus on fun employee activities, a mainstay of our corporate culture," Herrick said.

Based on the suite of Wonderware by AVEVA automation software, and with the technical assistance of Apex Manufacturing Solutions, New Belgium has achieved record levels of efficiencies in scheduled and non-scheduled downtime throughout its operations with the implementation of AVEVA's Manufacturing Execution System software.

"The Apex solution is unique in the sense that it incorporates the same 'ingredients' that New Belgium utilizes for making great craft beer — Creativity, Knowledge, and Experience."
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Sam Vail
Chief Strategy Officer, Apex

As Customer Demand Grows – How to Find More Time to Bottle

When New Belgium's operations management team began taking a close look at its bottling line and measurement of cases produced based on the equipment's capability, they realised that its existing lines were capable of producing 294,000 cases a week, but in reality were only producing 150,000 cases each week.

"After ramping up the work week of our bottling line and sacrificing some of our fun employee activities that our corporate culture is known for to meet growing customer demand, we were disappointed to find that brewery was producing only about half of the product the line was truly capable of producing," Herrick said. "That's when we realised it was time to look at how to rectify this situation, so we called on Apex and their team of software engineers to help determine next steps in achieving full production capabilities."

After completing an audit of its production line and the data being gleaned from system operations, New Belgium determined that valuable packaging time was being lost during both scheduled and unscheduled downtimes. Its longtime manual data recording process, which involved managing paper production logs and spreadsheets, was just not enough to keep up with the level of bottling production New Belgium was now required to achieve.

The management team realised it was time to take the next step in its plant automation strategy to implement a software strategy that would increase operational efficiencies, quality, compliance and overall performance.

"We had been using the paper-based system for a long time around here, but with the product volumes our staff was now faced with managing, this system could no longer cut it," Herrick said. "With the various changes in beer mixes and packaging options, the chance of error when maintaining these records manually significantly increased the chance for

human error. It was time to step up to the next level of automation so that we could accurately manage scheduled and unscheduled downtimes."

With the implementation of AVEVA's Manufacturing Execution System solution, Apex enabled New Belgium to use the data collected by the MES software to increase Overall Equipment Effectiveness (OEE).

"MES Performance coupled with New Belgium's continuous improvement strategy, has increased our packaging line efficiency by 30%, saving us more than $400,000 annually in previously planned labour expenditures. It also has extended our packaging area capacity to about 1.3 million barrels each year. At this point, our approach to higher volumes is 'bring it on'."

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Joe Herrick
Packaging Systems Manager, New Belgium Brewing

"The advantages of using AVEVA's MES at New Belgium Brewing in terms of operations is that we already have a mature InTouch HMI and System Platform powered by Wonderware environment, so implementation and integration are simplified. From an end user point of view, we can combine functionality at the InTouch HMI, keeping their experience simplified and enriched with better information to operate their processes."

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Lora Heckman
Business Applications Manager New Belgium Brewing

Improved Visibility Brings Increased Production Capacity

The brewery's existing systems provided huge amounts of data, but with no context. New Belgium's management team needed a way to effectively collect and analyse that data in order to turn it into actionable information.

With greater visibility and a true understanding of actual production capacity for predictable order fulfillment, New Belgium can maintain its production and sales targets. Management also is able to effectively reduce production costs, while at the same time improve overall product quality.

"At one point our filler was experiencing a significant amount of micro stops (30 sec., 20 sec., etc.) due to some bottles coming down the line that were falling down, or getting hung up on rails," Herrick said. "The AVEVA software was able to provide us specific information related to these downtimes, so we had our team complete a Kaizan evaluation to figure out what we needed to do to improve it. We decreased our downtime by more than 50%. This is very significant for our business."

By identifying the sources and the quantity of scheduled downtime as well as unscheduled downtime events, New Belgium could accurately track, record and address bottling performance. In addition, the operators can maintain accurate packaging production schedules, and effectively manage the supply chain of materials needed during the packaging process such as bottle and can sizes, labels coinciding with each type of brew, as well as specific order requirements.

The software also provided for smoother transitions between shift changes by enabling the new shift to easily view what went on during the previous shifts, which help them identify potential issues that need to be addressed by the staff.

Achieving Continuous Process Improvement through Flexibility and Scalability

The flexibility and scalability of the AVEVA's MES software has enabled New Belgium to customise its product packaging systems to meet its unique requirements for the efficient flow of captured production management data from the plant floor systems.

The combination of MES Performance with the brewery's existing installations of InTouch HMI and System Platform powered by Wonderware provides New Belgium the opportunity to ramp up automation process as necessary.

"New Belgium gave us a lot of leeway with development of the graphics to make the system engaging and fun to work with. We wanted to make sure the User Interface Experience (UIX) of this system was aligned with New Belgium's culture, which made it very unique! Operator support is critical in any Continuous Improvement project, so the terminology and workflow needed to match their expectations, and because a real-time version of the display is seen on the public tour, we created unique InTouch graphics that were consistent with all the cool things the visitors had already seen along the way."

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Sam Vail
Chief Strategy Officer, Apex Manufacturing Solutions

"The model-driven approach of System Platform gives us the ultimate platform for expansion when the customer wants to extend their MES system up, down, or sideways," said Sam Vail, chief strategy officer at Apex Manufacturing Solutions. "With this unique scalability, we can start small without having to worry about switching to a different technology when the solution heads into uncharted territory. Application Server allows the Apex team to have a 'can do' attitude, regardless of the situation or industry."

The AVEVA software solution at New Belgium Brewing can now quickly and easily replicate these automation processes at other areas of the company with its reusable engineering application. This provides for the customisation of the same approach and design to align with New Belgium's unique look and feel across multiple locations.

Reusable engineering in regards to objects and graphics allow Apex to provide a scalable solution that's economical in scale for the customer as new areas of the plant are introduced into the reporting and graphics infrastructure concerning Performance.

"The ability to customise graphics provided by the MES enabled Apex to develop a system that could effectively communicate the line status and production capacities in the New Belgium bottling and packaging lines, while at the same time illustrate the company's unique company culture with engaging graphics," Vail said. "Screen data shows what order is being worked on, what is coming next, and how the current rate compares to their standard.

Enabling New Belgium to React More Quickly to Unscheduled Downtime

Unscheduled downtime means loss in production time and a loss in profits. The Manufacturing Execution System from AVEVA was the catalyst that enabled New Belgium to take control of its operations processes. As a result, the brewery realised that it needed to increase its maintenance staff to more quickly address equipment repair issues.

Increasing the maintenance team by 60%, adding a process improvement and analysis team, educating key staff in Kaizen processes, and training others in Six Sigma has allowed the company to more quickly react to gaps in production methods to drive overall process improvements.

The bottom line — New Belgium Brewing needed information and an effective way to process and evaluate that information to benefit its overall business. The MES Performance software has delivered on their expectations by effectively increasing New Belgium Brewing's OEE.

"With the scalability provided by the Manufacturing Execution System solution, we are able to continuously improve operations incrementally by deploying various aspects of the solution one step at a time," Herrick said. "All of our jobs are changing including how we go about our day-to-day business because of the data now being delivered by the MES Performance. We now have mechanics on each shift 24/7 to support the bottling line and we have lead techs that are addressing issues identified in trends noted by the software. Access to this real-time information enables our team to work on things ahead of time by performing preventative maintenance, enabling us to get out in front of potential issues."

Tapping the Future

Evolving and effectively maintaining best practices with AVEVA's Manufacturing Execution System allows for expansion of the system across multiple areas of New Belgium, as well as at its new plant currently under construction in Asheville, N.C.

"By increasing our operations efficiency, we now can free up time to get back to focusing on our corporate culture," Herrick said. "When our operations were running so quickly, we had to eliminate some of our popular employee extracurricular activities, such as our annual volleyball tournament. Today as we gain momentum in production, our people see the benefits and we are now very much in control of production processes."

New Belgium is now meeting capacity, surpassing production of 200,000 cases a week, and having time left at the end of the day for "fun." Taking advantage of the full capabilities of its existing resources at the plant enabled the executive management team to delay funding of additional capital investments, reduce overhead, and make commitments to new things. This includes focusing on building the second New Belgium Brewing in North Carolina.