

# Carlsberg Leverages IoT to Improve OEE and Launch Their Digital Transformation Journey

PTC's ThingWorx Unlocks Real-time Performance Monitoring and Predictive Maintenance Across Brewing Facilities



In modern manufacturing, collecting production data is imperative to improving overall equipment effectiveness (OEE). From reducing line delays to proactively scheduling maintenance, the right technology can help leverage machine data to unlock value across the enterprise. Learn how one manufacturer used PTC's ThingWorx to revitalize beverage production and improve OEE all while maintaining their commitment to innovation and sustainability.

## The Carlsberg Group is a global leader in the beer brewing industry

Whether it's porters, pilsners, ales, or stouts, the process of brewing the beloved fermented beverage is both an art and a science. No one knows this better than the Carlsberg Group, a global brewer whose products are steeped in a rich history dating back to 1847.

Today, Carlsberg operates 78 facilities around the world and maintains more than 140 brands in their beer portfolio, spanning core beer brands, craft and specialty varieties, and non-alcoholic options. The Danish company employs more than 40,000 people around the world and strives to uphold its promise for a better today and tomorrow—including an ambitious plan to reduce their carbon footprint and operate zero-emission breweries by 2030.

## Disparate systems and processes compromise OEE across the industry

Unlike other highly digitized industries, the brewing industry has only recently begun

implementing digital solutions to optimize manufacturing processes. Carlsberg, however, has been exploring digital solutions for over a decade, looking at ways in which they can enhance their manufacturing processes and performance measurement.

One of the industry-wide challenges faced by Carlsberg and many others is that when manufacturing lines lack connectivity, it's more difficult to collect timely, useful data. At Carlsberg, production data had been collected in some instances, but it was done manually using paper, which led to longer lead times and prohibited visibility into real-time data on status and stoppage.

Having explored digital solutions for some time, Carlsberg recognized an opportunity to improve the limited visibility into machine status for those working on the line. Doing so would alleviate the fact that workers sometimes had to leave a post to check on progress or investigate the cause of unplanned downtime. This, in turn, presented challenges for workers who didn't have

comprehensive information regarding previous fixes, sometimes creating additional delays.

Aiming to begin implementing improvements, some Carlsberg facilities acquired large screens for more advanced monitoring of line performance, though others continued to use manual systems. In the facilities using digitized screens, some live equipment data was displayed, but not enough to fully assess how a shift was progressing against its target. Carlsberg knew that with more consistency in data collection across the company's facilities, they could lower costs while increasing throughput. To improve performance of their manufacturing lines, they began looking for a consistent, streamlined solution for tracking production data across the enterprise.

### **Carlsberg leverages PTC's IoT solutions to improve OEE across facilities**

Knowing that a centralized approach to equipment performance monitoring would help them offer a more consistent product and improve OEE across







facilities, Carlsberg implemented PTC's Internet of Things (IoT) solutions for improved data collection and analysis.

They began by connecting equipment on multiple production lines via PTC's Kepware and ThingWorx. Kepware is software that pulls data from diverse automation devices and software applications and aggregates it into a single digital data set. It's especially helpful for connecting and securing access to data from legacy machines, like the ones in many Carlsberg facilities. ThingWorx is PTC's end-to-end industrial IoT platform that provides visibility into production and asset health with real-time data analytics and a rich array of insights and production reporting. ThingWorx enables visualization of the data from Kepware so that it can be contextualized and leveraged for real-time condition monitoring and diagnosis.

The PTC technology has helped Carlsberg begin to implement a critical use case: real-time performance monitoring. Leveraging ThingWorx data, Carlsberg is in the process of using large digital screens to show a dashboard view of the current setup, performance, asset status, and key performance indicators of each specific line. By viewing the screen, operators will have a clear understanding of how the line is performing and can assess factors such as estimated time of completion and speed of water consumption—and compare those rates against projected targets. Similarly, some floor operators will be able to use tablets equipped with an app that leverages ThingWorx data to track the downtime of a specific machine and proposes the reason in real time. The operator can then confirm next actions to take, even from a remote location in the facility.

Another advantage of using ThingWorx is that it minimizes disruptions for existing brownfields by unlocking data without having to replace entire systems in order to recognize value. By utilizing ThingWorx with Kepware, Carlsberg can improve the performance of all packaging lines without changing the assets and controls already in place.

### **Microsoft Azure integrates with PTC solutions for advanced analytics capabilities**

Knowing that a cloud-based solution would minimize the need for on-premise storage, Carlsberg turned to the Microsoft Azure Cloud platform, which offered not only secure storage, but the flexibility to pair and scale with ThingWorx for a more centralized operation. Within their new solution, data goes to Microsoft Power BI to create dashboard views across the enterprise—and ThingWorx contextualizes the data for on-screen viewing. With the solution hosted on Azure, a single application can now be deployed across multiple plants, even those with infrastructure variability. This enables quick scaling of the solutions across facilities and allows Carlsberg to set up the foundation of their digital transformation journey.

Furthermore, the powerful pairing means that Carlsberg can leverage deep domain experience in industrial manufacturing and cloud technology—and get the most out of PTC's advanced technology solutions with rapid time to value. "It's been very easy to use ThingWorx with Azure to collect new data, process it, and create something new," says Marco Farina, Global OT Manager at Carlsberg. "That's the benefit of the PTC and Microsoft solution—that you can create something and go from the concept to the rollout to the go-live very, very easily."

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*Global OT Manager, Carlsberg*

### **Digital transformation for a better tomorrow**

To date, Carlsberg has implemented the cloud and IoT-based solution in 28 brewing facilities. Eventually, the agenda will include the installation of ThingWorx in the remaining breweries. While Carlsberg's digital transformation journey is still unfolding, they've already seen clear benefits of real-time performance monitoring throughout their business. They've noticed a clear improvement in operational procedures and higher rates of production. This improved efficiency contributes to how they have been able to significantly reduce waste and better align with company goals around carbon emissions and sustainability.

Carlsberg's improved processes also provide them with greater visibility and opportunities for predictive maintenance. Using ThingWorx data collected from the lines, they have a method for root cause analysis, which gives them a clearer understanding of line problems and will help them reduce delays and stoppages. "By looking at the historical data, we can determine when a failure might happen and will soon be proactive in scheduling maintenance around that expectation," says Farina. "Moving toward these capabilities has helped us see improvements every day, especially since we started to do the reporting and aggregating of all the data worldwide."

Notably, the reaction and level of support for the change has been positive from executive leaders to management to floor operators, according to Farina. "Our management has been very supportive of the digital transformation because they've seen firsthand that it's key to improving efficiency—it's a fundamental tool for doing that."

As they move forward, Carlsberg is eager to continue connecting their brewing enterprise on a global scale by developing a "single-pane-of-glass" view across all facilities. Doing so will help them solve the root cause of every inefficiency, assess performance from one facility to the next, and determine where they can bring in new technologies to further improve operational and personnel performance.

For many at Carlsberg, advancing their digital journey has been a reminder of the company's consistent place in the brewing industry as not just an innovator, but as a company looking to create a better, more sustainable future.



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