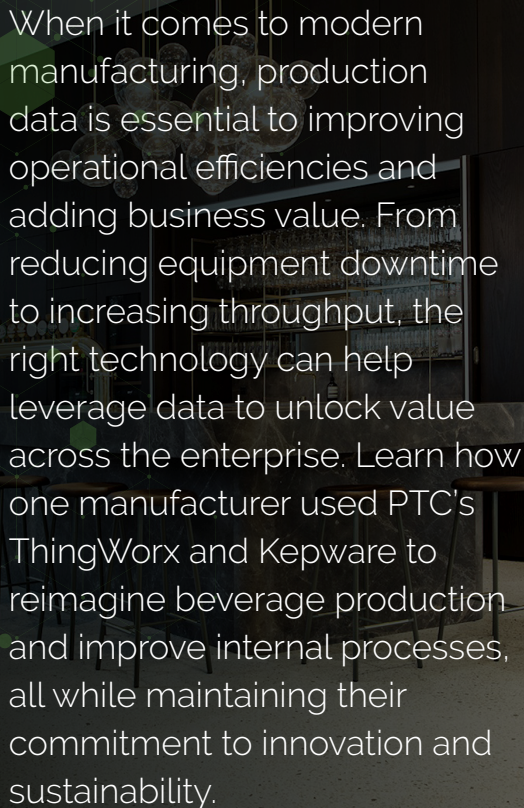


# Carlsberg Leverages IoT to Scale Digital Transformation Across Global Sites

The Partnership with Autoware Enables the Brewing Company to Advance Their Design, Deployment, and Scaling of Real-time Performance Monitoring



When it comes to modern manufacturing, production data is essential to improving operational efficiencies and adding business value. From reducing equipment downtime to increasing throughput, the right technology can help leverage data to unlock value across the enterprise. Learn how one manufacturer used PTC's ThingWorx and Kepware to reimagine beverage production and improve internal processes, all while maintaining their commitment to innovation and sustainability.

## Carlsberg is a Danish brewing company with a global reach and a rich heritage

Founded 172 years ago, Carlsberg is a Danish Brewing company with a global presence that is one of the world's leaders in the brewing industry. They operate 78 brewing facilities around the world, and with over 140 brewed beverages—including core beers, specialty and craft beers, alcohol-free brews, and local brands from numerous countries—Carlsberg has a diverse and globalized beer portfolio.

Unlike other industries, the brewing industry has only recently begun implementing digital solutions to optimize manufacturing processes. Like many manufacturers that operate sites in different regions of the world, Carlsberg faced some challenges in standardizing how various sites tracked production data.

Carlsberg had been exploring digital solutions for over a decade, looking at ways in which they could enhance their manufacturing processes



and performance measurement while improving overall equipment effectiveness (OEE). Despite having a full manufacturing execution system (MES) in 10 factories, Carlsberg wanted a lighter solution that would scale quickly and easily, and ultimately help them standardize data collection across their global facilities to improve production performance. They recognized that with more consistent data collection methods, they could optimize machine performance, decrease unplanned downtime and costs, and increase throughput.

### **Carlsberg partners with Autoware to leverage IoT solutions and improve OEE**

Carlsberg worked with Autoware, an Italian software company focused on implementing digital transformation in the manufacturing sector, as the technology partner to help them begin the process of improving their data collection and operations. To do so, Autoware leveraged PTC technology to design an IoT-based application for real-time performance monitoring. The application could be used by machine operators to easily

assess production performance across different facilities via real-time data and alerts.

To develop the application, Autoware utilized Kepware, a software that automatically pulls data from a variety of automation devices and software applications and aggregates it into a uniform data model. In addition, Autoware used ThingWorx, an end-to-end industrial IoT platform which provides visibility into production and asset health with real-time data analytics and a rich array of insights and production reporting. Together, the technologies allowed Carlsberg to monitor machine data and project it onto dashboards, laying the foundation of their digital transformation journey.

The data will give operators a clear understanding of how the line is performing against targets, while real-time alerts help them quickly identify and resolve any production issues. 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.



Autoware promotes innovation in the manufacturing sector by integrating systems with creative Industry 4.0 solutions. As a long-time PTC partner with deep expertise in manufacturing technology, Autoware was the ideal choice for assisting Carlsberg through their revitalized digital journey. Ready to pursue success, Autoware's team quickly integrated into the project to help design, deploy, and scale a new IoT solution across the enterprise.

## Autoware's solution helps Carlsberg standardize and scale with efficiency

Carlsberg had already laid much of the groundwork toward standardization across facilities, but their new solution would better address the gaps created by legacy equipment and variations in data collection, architecture, and software. Importantly, the standardization of data and metrics will allow Carlsberg to evaluate machine performance and productivity relative to other factories. After launching in just three months, it will also help satisfy the need to scale quickly across multiple facilities.

"Our goal was to develop an application that provides a common standardized view of production data to the client," says Luigi De Bernardini, CEO of Autoware. "Having that common view enables them to make decisions on how to organize production and measure the efficiency of the various production sites in a very objective way—that's the real business value."

Notably, Kepware was key to achieving value and to working within a centrally configured data environment. It allows them to import and export configuration information and easily adapt any particular facility's variances to meet the

application's data standards. Kepware collects data from the PLCs throughout the regional sites, and ThingWorx utilizes the data from Kepware and visualizes it for real-time monitoring and diagnosis at each site.

The team chose a cloud-based architecture for the new solution, which offers some significant benefits over the previous on-premise solution in their other facilities. A cloud-based solution makes it easier to evolve the system and add new features. Any updates to the application only need to be deployed once, and the cloud-based architecture makes those same changes immediately available to any site. At the same time, they can make some site-specific features available only to certain locations and deploy them at others later.

This flexibility to configure the solution as needed—thus being more efficient and saving time—greatly improves the total cost of ownership. "The footprint of the new solution is much smaller than the footprint of an on-premise solution—it takes fewer resources to manage," says Marco Faltracco, Technical Lead at Autoware. "The architecture enables them to scale to so many more plants, and now they're considering further expansion because it's easy to do that," he continues. "In terms of total cost of ownership, it's much lower than having an on-premise solution."

## Carlsberg achieves improved performance and productivity while planning for a more sustainable future

To date, the application has been rolled out at 28 Carlsberg facilities. Eventually, the agenda will include implementation in the remaining breweries. While Carlsberg's digital transformation journey is still unfolding, they've already seen clear benefits of real-time performance monitoring





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**Luigi De Bernardini,**  
CEO, Autoware

throughout their business. First, they've seen improved operational procedures, as well as fewer line interruptions with greater visibility. Additionally, Carlsberg has experienced reduced equipment downtime with better preventive maintenance. Another positive outcome is the reduction of waste, which positively contributes to company goals around carbon emissions and sustainability.

Notably, the power of partnership has made all the difference in Carlsberg's ability to roll out their solution with confidence and efficiency, which only stands to benefit all parties in the long run. "As a team of partners, we worked closely and were able to deploy at the last site in just a few days," says

De Bernardini. "Together, we reached the point in which the whole team was skilled at their duties and responsibilities. In fact, our entire business model is based on partnerships," he explains. "We believe that with this kind of project, the only way to have it succeed is to build a strong team with everyone involved and tie it all together with the right technology."

For Carlsberg, advancing their digital journey has been a confirmation 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—and they look forward to partnering with Autoware for continued success.

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