

# Brembo Races Towards Digital Transformation by Accelerating Innovative IoT Use Cases

Improving OEE and Scaling Use Cases Quickly Across the Enterprise with ThingWorx and Kepware

When a vehicle is built for speed, control is critical. No automotive company delivers a braking system with as much precision and panache as Brembo. As an automotive industry leader with 75 production lines in North America and additional facilities across 14 countries, Brembo wanted to start their digital transformation quickly and scale the initiative across their enterprise. Learn how Brembo is staying ahead of the competition by leveraging Kepware and ThingWorx to implement innovative use cases and optimize manufacturing operations

## An automotive industry leader, Brembo is dedicated to creating high performance products

Brembo is a global leader in the design, development, and production of braking systems and components for cars, motorbikes, industrial vehicles, and machinery. Brembo's heart is in the racing world, helping to win more than 500 motorsport championships since 1975 with their easy-to-spot red braking systems. They are headquartered in Italy and have industrial sites in 14 countries spanning North America, Europe, Asia, and South America. With a focus on innovation and improvement, Brembo has structured their business so that 10% of employees are in research and development. This drive to improve served Brembo well when they set out to digitally transform.



## Brembo partnered with PTC and Brock Solutions to connect data sources and collect data

To begin their transformation journey and unlock real-time insights, Brembo knew they needed to connect equipment and collect data. With more than 40 facilities across 14 countries, all with unique processes and equipment, Brembo had plenty of data but little insight. Furthermore, before undergoing their digital transformation, Brembo manually accessed data through USB keys and then conducted analysis in siloes.

Without being able to collect and analyze information easily across production lines, Brembo faced several challenges. First, they lacked visibility into line operations; second, their troubleshooting capabilities were curtailed by slow, manual data collection; and third, Brembo faced barriers to ensuring consistent operations and minimizing variance—specifically, they struggled to catch variances early and therefore had a constrained ability to limit quality impacts and reduce scrap. Due to these challenges,

Brembo could not maximize efficiency across production. They needed a way to integrate disparate sources of process data and gain insights into plant floor operations.

Brembo wanted a tool that would facilitate industrial connectivity and allow them to link a variety of legacy machines and PLCs. They found that ThingWorx Kepware Server enabled them to integrate disparate sources of data, and then display the data as a complete story of what is happening on the production line. Brembo also wanted a flexible solution that could build on their existing infrastructure to provide real-time insights. They stressed the importance of speed to deployment; a solution that could scale across the enterprise quickly and effectively was essential. Leveraging PTC's end-to-end industrial IoT platform, ThingWorx, Brembo was able to quickly deploy and scale across their existing infrastructure. ThingWorx delivered visibility into production and asset health with real-time data analytics and a rich array of insights and reporting, while enabling the flexibility and speed of deployment that Brembo needed.



## Brock Solutions

Brock Solutions is a trusted ThingWorx and Kepware integrator, bringing automation and IoT expertise as well as a proven methodology for designing solutions with scalability in mind. Jason Wolfe, Manufacturing Director at Brembo North America, explains why Brock is an essential partner: "Brock understands the manufacturing domain. We wanted someone who not only understood the technology, but could also provide insights, ideas, and manufacturing expertise to ensure the solution was robust and solved real business problems." Brock outlined a digitization roadmap, starting with a three-line pilot and followed by a phased approach to a full facility rollout. This approach allowed continuous improvements to occur at the same time as the expansion of the solution.

With the help of Brock Solutions, Brembo leveraged the connectivity of Kepware and rapid development capabilities of ThingWorx to implement a real-time production performance monitoring (RTPPM) use case within 10 weeks. Kepware and ThingWorx are used to connect their production lines and a centralized data hub—enabled by ThingWorx—aggregates data across servers for the display of plant-level, regional, and corporate-level views. Production data is collected and then displayed on three custom dashboards. Each dashboard provides a unique user group with real-time, actionable data as well as drill-ins, alerts, and process flow "pop-ups" that help operators troubleshoot in real time. With this connectivity in place, Brembo could start to ensure that their lines were operating

consistently and efficiently, therefore minimizing variance. Moreover, with new insights unlocked, Brembo developed new KPIs to increase value, save time, and build a better foundation for future improvements.

### **To ensure success and continually improve, Brembo knew it was critical to converge IT and OT**

To successfully scale their solution, harness future growth, and drive continuous improvement, Brembo set out to build new systems and processes around the data they collected with Kepware. Brembo recognized that successful IT/OT convergence would be key to accomplishing their goals.



Brembo focused on two guiding principles when it came to IT and OT convergence: one, create clear boundaries between IT and OT responsibilities, and two, ensure IT is deeply familiar with OT needs and industry trends so IT can help OT drive productivity. Further ensuring their success, Brembo segmented IT and OT responsibilities with a simple framework: OT is responsible for what happens within the line, and IT is responsible for what happens outside of the line.

Even though responsibilities are clearly delineated, success requires constant communication and collaboration between IT and OT. IT needs to guarantee a continuous flow of information to/from the line, while OT needs to guarantee a continuous flow of products out of the line. IT and OT are two sides of the same coin, so they must work together to produce value. To give an example of how Brembo supported their IT/OT convergence, they brought on data scientists to provide decision-making support to OT. By successfully sharing data across IT and OT, Brembo was able to improve visibility into line operations, increase operational

efficiency, prioritize initiatives that drive valuable change, and improve OT trouble shooting capabilities using Kepware. This thoughtful approach to IT/OT convergence allowed Brembo to successfully expand their use cases.

### **Brembo expanded their IIoT use cases to improve OEE and unlock powerful insights**

After a successful pilot program, Brembo quickly realized they could accomplish more with Kepware and ThingWorx to accelerate their digital transformation journey. Brembo started expanding their use cases by integrating Kepware and ThingWorx into all their processes. They began by improving overall equipment effectiveness (OEE) through RTPPM and asset monitoring. OEE is a combination of three main factors: cycle time, downtime, and first pass yield; ThingWorx and Kepware's combined functionality allowed Brembo to analyze all three to optimize efficiency across all their lines.



For example, ThingWorx enables Brembo to test the cycle time of two parallel production lines against one another and against budgeted cycle time to gain insights into line performance. Brembo can now identify where waste is occurring because they can see if a line is operating outside of its budgeted cycle time. More than that, they can compare cycle times across lines to identify where cycle time could be improved—further optimizing line performance. This awareness allows Brembo to address problems that were previously invisible to them. Furthermore, asset monitoring and utilization capabilities enable Brembo to identify when and why machines have unplanned downtime. Asset monitoring is the basis for predictive maintenance capabilities, which will allow Brembo to save additional time and resources. By improving OEE, Brembo is reducing waste, quickly identifying and resolving issues, and improving efficiency across their production lines.

In addition to improving OEE, Brembo is using Kepware and ThingWorx to streamline processes on the production line and beyond. For example, Brembo uses Kepware to monitor their gas and power meters and save energy. Based on data collected through Kepware, Brembo automated the power systems so that they shut down power to the equipment if the line is not running and restore power when the line resumes production. This saves Brembo from continuously running equipment in idle mode and therefore consuming excess energy.

Brembo also uses Kepware to more easily monitor pollution requirements to ensure compliance. By supporting data collection and analysis on chemicals that have stringent pollution requirements, Brembo is using their IoT solution to run analytics and capture data logs to track production closely and ensure compliance.

Kepware is also used to integrate information from Brembo's production line straight to enterprise resource planning (ERP) financials. Because Kepware is now integrated into line equipment, Kepware can automatically send the production line information to the ERP system to do the accounting, inventory, and financials. By automating data collection and analysis, Brembo minimizes the risk of human error, saves valuable time, and streamlines regulatory compliance processes.

From OEE to ERP, Brembo's use of Kepware and ThingWorx is expansive: "There are a lot of things that we are now starting to finalize that were part of our original vision—things that before our digital transformation the plant could only have dreamt of, but today they are becoming a reality," says Stephen Ceccarini, IT Manager at Brembo North America. With powerful insights now at their fingertips, Brembo is improving production line efficiency, saving time, identifying problems earlier, and streamlining processes across the business.



## Building systems to scale quickly

With help from PTC and Brock Solutions, Brembo scaled ThingWorx and Kepware use cases rapidly across their production lines and equipment, beginning with just three lines and working their way up to 75. Dan Sandberg, CEO of Brembo North America, highlights how the partnership with Brock and powerful PTC tools enabled them to see the results of digital transformation faster than imagined: "PTC's partnership with Brock Solutions, along with the ThingWorx platform, have helped us accelerate our digital transformation. The solutions delivered have shown value in weeks, rather than months, and will help us drive innovation and improve business results."

Because of ThingWorx and Kepware's ability to quickly connect legacy machines and provide visibility into real-time information through a centralized data hub, Brembo was able to scale their initiative quickly. Each plant has a dedicated OT engineer to integrate any changes that are related to ThingWorx. Rather than create one-off solutions, the team at Brembo designed models that could be applied across scenarios with minimal changes. Brembo has implemented a change management control throughout all the Kepware servers to automatically backup the full configuration of the server. This allows Brembo to tell the application to make a snapshot before and after a change is made so that they can be compared. Brembo can then replicate the configuration elsewhere so solutions can be scaled across the enterprise. Brembo has also established standard naming conventions and processes so that they can manage, compare, and link information across the different solutions using ThingWorx and Kepware.

"PTC's partnership with Brock Solutions, along with the ThingWorx platform, have helped us accelerate our digital transformation. The solutions delivered have shown value in weeks, rather than months, and will help us drive innovation and improve business results."

**Dan Sandberg,**  
*CEO of Brembo North America*

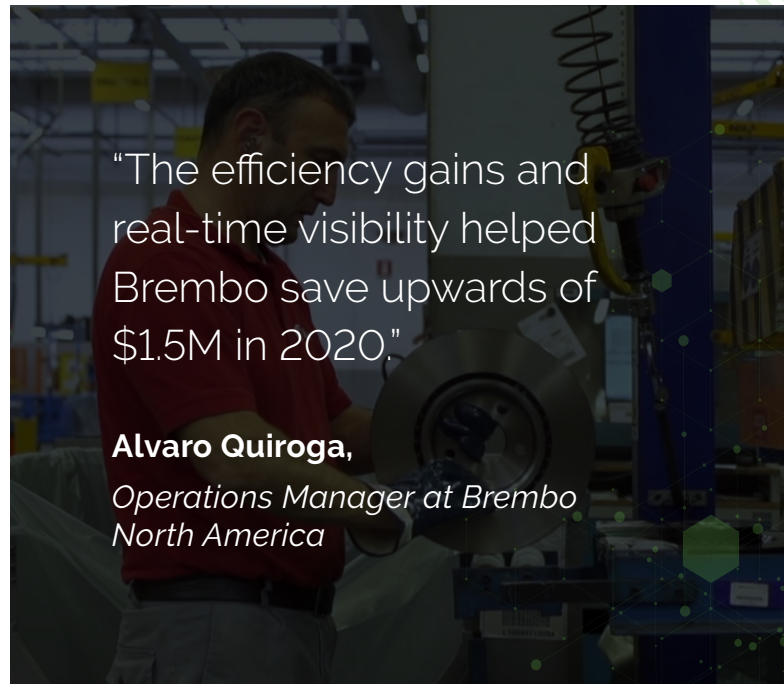
By building solutions to scale and creating the internal structure to encourage the adoption of new solutions across the business, Brembo made fast work of their digital transformation. In the words of Alvaro Quiroga, Operations Manager at Brembo North America, "Everything now is Industry 4.0 through Kepware and ThingWorx, end to end." Through their work to create solutions that can scale across their enterprise, Brembo successfully laid the groundwork for continuous improvement.



## Brembo harnessed the power of ThingWorx and Kepware to realize incredible results

Brembo is saving time with real-time visibility and empowered employees. With data collection done through Kepware instead of by the individual operators, operators are more efficient and can produce more parts, reducing time to market. For example, a troubleshooting scenario that would take almost three days of data analysis now takes 3-4 hours. With real-time data, Brembo can dive directly into the relevant information to determine any issues. This has enabled them to avoid overtime work as well.

Brembo is improving OEE by decreasing scrap and re-work, enhancing quality, and improving uptime and throughput. Before embracing Industry 4.0, OEE was calculated roughly at the end of each shift. Through ThingWorx, the back office at Brembo can understand what is happening in real time and therefore make proactive decisions to improve throughput.



"The efficiency gains and real-time visibility helped Brembo save upwards of \$1.5M in 2020."

**Alvaro Quiroga,**  
*Operations Manager at Brembo  
North America*

ThingWorx enables Brembo to identify bottlenecks that were previously invisible by analyzing cycle time. These innovations have led to huge savings for Brembo: "The efficiency gains and real-time visibility helped Brembo save upwards of \$1.5M in 2020," says Alvaro Quiroga, Operations Manager at Brembo North America.

Not only is Brembo seeing real value in money saved, but they are also able to be increasingly customer centric. With visibility into production line operations and access to real-time data, Brembo has the confidence to address requests coming from customers and compliance officials in a timely manner.


"When we started this project, it was a proof of concept; now the plant cannot live without this technology as we're operating at such higher levels of connectivity, efficiency, and productivity," says Ceccarini.



## Already well on their way to digital transformation, Brembo is not done yet

While Kepware and ThingWorx are incorporated into almost every part of their production line operations, Brembo is not done with their digital transformation. Next steps for Brembo include improving the changeover process and minimizing downtime during that process, utilizing AI and machine learning for predictive maintenance and other use cases, further optimizing OEE by minimizing cycle time and improving first pass yield, and implementing augmented reality for work instructions to empower frontline workers with the right information at the right time.

Ultimately, the adoption of Kepware and ThingWorx has allowed Brembo to maintain leadership and competitive advantage in the highly competitive automotive industry. "We think the sky is the limit. We will keep developing new tools and adding value to the organization. We feel that going forward, we'll be even more successful than we've been in the last three and a half years," says Quiroga.



"We think the sky is the limit. We will keep developing new tools and adding value to the organization. We feel that going forward, we'll be even more successful than we've been in the last three and a half years."

**Alvaro Quiroga,**  
*Operations Manager at Brembo North America*

[www.ptc.com/en/case-studies](http://www.ptc.com/en/case-studies)

© 2021, PTC Inc. (PTC). All rights reserved. Information described herein is furnished for informational use only, is subject to change without notice, and should not be taken as a guarantee, commitment, or offer by PTC. PTC, the PTC logo, and all PTC product names and logos are trademarks or registered trademarks of PTC and/or its subsidiaries in the United States and other countries. All other product or company names are property of their respective owners. The timing of any product release, including any features or functionality, is subject to change at PTC's discretion.