VCST fuels continuous product and process improvements through smart factory initiatives

Automotive manufacturing is a competitive industry with the highest quality standards. There is immense pressure to keep costs low and drive innovation, especially amidst the disruption caused by COVID-19. Continuous process and product improvements are the key to reducing costs and delivering value for customers—and staying a step ahead of the competition in any environment.

VCST is committed to digital transformation

Staying competitive means constantly searching for product and process improvements. VCST, a world-class automotive supplier of powertrain and brake components, knew this even before COVID-19 disrupted the industry.

Part of the BMT Group, VCST manufactures gears and other mission critical automotive components that have a significant impact on overall vehicle performance. Headquartered in Sint-Truiden, Belgium, and backed by almost 50 years of experience, they are the preferred partner for automotive original equipment manufacturers (OEMs) and Tier 1 suppliers. Known for their quality and reliability, VCST services global brands including, but not limited to, Continental Automotive, Volkswagen Group, American Axle, Ford, Caterpillar Perkins, DAF PACCAR, BorgWarner, and Cummins.

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VCST has been committed to digital transformation and building the factory of the future over the past several years. Their factories are already highly automated, but the automotive industry is a challenging environment for many manufacturers. Regulatory and extreme cost pressures mean manufacturers need to search for ways to constantly make efficiency and quality improvements. When COVID-19 intensified these trends, VCST responded by innovating.

VCST focused on the business impacts of cost, quality, innovation, and time to market

In the face of these pressures, VCST identified several opportunities to implement smart factory initiatives for their facility in Belgium. Their objectives were to reduce costs, increase the quality of their products, fuel innovation, and improve time to market.

They started by looking at efficiency. While much of their factory was already highly automated, the quality and maintenance departments were not. These supporting departments relied on paper processes, as well as disconnected systems that worked in siloes. As such, automating workflows and digitizing processes were clear ways to increase efficiency and reduce costs on the shop floor.

Quality was another key consideration. In the automotive industry, low-quality parts simply aren't an option. If there is a customer complaint, a complete inspection of the facility is required, resulting in extensive downtime that significantly impacts margin. A lack of digitized change governance also affects quality—paper processes are time consuming and there are opportunities for human error. Beyond just cost considerations, VCST focused on maintaining their high-quality standards in order to meet and exceed the expectations of their automotive customers.

At the same time, VCST saw an opportunity to embrace innovative processes and technologies in order to adhere to new international noise, vibration, and harshness (NVH) regulations. Cars are becoming quieter as they shift towards electric. Any noise and vibration coming from the engine—often produced by gear-on-gear friction—is a problem. As a result, customers ask for process data to search for correlations that might indicate the source of noise. Automotive manufacturers are expected to provide detailed data and keep identified parameters below specific noise thresholds. The companies that can't innovate and offer these new services will lose business.

And finally, siloed systems and disparate workflows meant that any level of change dealing with product manufacturing took too long. Traceability data needed to assess the impact of a change resided in four to five different systems. Paper processes slowed down any recommended adjustments to production. As they evolved products, VCST recognized that the ability to quickly implement changes was essential to driving revenue and staying competitive.

VCST and Ad Ultima Group developed an end-to-end vision for their smart factory initiatives

To accomplish this, VCST turned to their key advisory partner, Ad Ultima Group. Ad Ultima Group specializes in process improvement and the automation of product development, production, and distribution. This made them the perfect fit to help VCST deliver value and drive innovation.

Together, Ad Ultima Group and VCST established an end-to-end vision for their transformation efforts. Leveraging the Internet of Things (IoT) and holistic product lifecycle management (PLM) technology, they developed the framework for a collaboration platform that would bridge the gap between the IT and OT landscapes—setting the stage for continuous improvement and smart factory initiatives across their entire business.

Their strategy was to combine the capabilities of IoT and PLM. They recognized that by infusing real-time IoT data and digital solutions across their operations, VCST would speed time to market—delivering more flexibility and faster response times. And by connecting suppliers, people, devices, machines, and customers in unified systems and smart applications, there was an opportunity to drive more reliable and transparent processes.

By unifying IoT and PLM systems of record, VCST and Ad Ultima Group created a "closed-loop" lifecycle system, capturing all changes and configuration information. They planned to collect data, monitor processes and machines, and send information back to engineering for root cause analysis and corrective and preventative actions. Across all the complex relationships

Ad Ultima Group is a key advisory partner in VCST's digital transformation. They helped establish a holistic, end-to-end vision for VCST's Industry 4.0 initiatives. Together, VCST and Ad Ultima Group developed a collaboration platform for a closed-loop product lifecycle management (PLM) system that continuously monitors and shares the condition of products into the engineering and production cycles. This "single source of truth" enables VCST to enhance product quality and increase competitiveness through innovation.

within their facility, from engineers to machines to maintenance processes, they designed a system that could unlock insights and find patterns to continuously improve products and processes.

"With our previous initiatives, we were thinking in siloes. Then we quickly realized we have to think out of the box. We had to think in an end-to-end scenario," says Eddy Van Steyvoort, the VP of Business Line Automotive. "The holistic view provided by Ad Ultima Group around linking the PLM and IoT solutions helped establish a strong digital foundation and created a continuous change management loop."

VCST and Ad Ultima Group envisioned a modular approach to this implementation. This meant flexibly integrating the platform into VCST's IT and OT systems piece by piece, rather than all at once. They took this approach in order to begin the project quickly, achieve wins along the way, and reduce the risk of a rip and replace solution. All they needed was the right technology to deliver on their vision.

VCST and Ad Ultima Group partnered with PTC to implement an IT/OT collaboration platform

PTC quickly emerged as the ideal technology partner for the initiative. Because PTC had an existing relationship with the larger BMT group, VCST felt comfortable building on that strong partnership.

"It's exciting to work together with VCST at the strategic level. And with PTC technology, we're able to build the IT architecture of the future for VCST. Digital transformation requires end-to-end thinking. You can't do it for just a part of your business," says Fillip Bossuyt, the CEO Ad Ultima Group.

PTC's ThingWorx IIoT platform, ThingWorx Kepware Server, and Windchill were the solutions that VCST used to fuel their smart factory initiatives and reach their long-term objectives. Together, PTC's IoT and PLM solutions enabled VCST to build an IT/OT collaboration platform through a flexible, modular approach—enabling them to integrate it into their existing systems, including their ERP (SAP), step by step.

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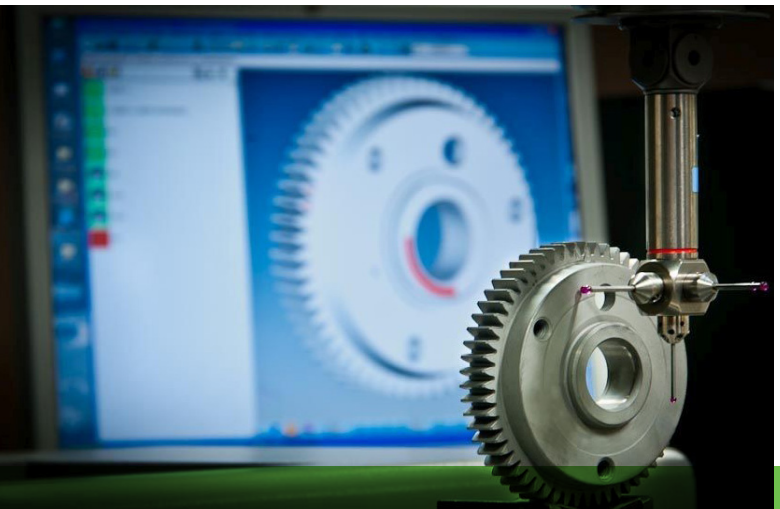
Eddy Van Steyvoort, VP of Business Line Automotive

ThingWorx and ThingWorx Kepware Server are powerful IoT solutions that fuel asset monitoring and automation scenarios. Kepware Server provides the flexibility that VCST needs to connect a wide variety of legacy machines and PLCs. ThingWorx connects, collects, and analyzes data across VCST's operations—giving them valuable visibility into every aspect of production.

VCST implemented Windchill as comprehensive PLM software for data governance and traceability providing a single source of truth across engineering, operations, suppliers, and customers. Now, everything in the factory is changed managed and linked to process plans, as well as engineering bill of materials (EBOM) and manufacturing bill of materials (MBOM). ThingWorx Navigate also provides role and task-based apps for non-expert users to view and interact with product data in the context of their system. And pulling IoT information into PLM software enables VCST to find patterns and continuously improve their products and processes.

Due to the flexibility of PTC's solutions and out-of-the-box applications, VCST was able to realize their modular approach to implementation. Windchill's open architecture enabled integrations with other enterprise systems—including IoT—and provided a foundation for a product-driven digital thread. Leveraging the standardized APIs in Windchill and ThingWorx, VCST and Ad Ultima Group completed the project in small slices.



VCST structured their digital transformation around several strategic initiatives

While the collaboration platform opened the door to countless opportunities for VCST, their initial smart factory initiatives with PTC and Ad Ultima Group revolved around increasing overall efficiencies and mastering the production ramp-up by breaking down silos with an end-to-end approach. By reducing costs, increasing the quality of their products, fueling innovation, and improving time to market, these use cases enable VCST to deliver more value to their customers and cement themselves as leaders in the automotive industry.

VCST collected operational data to identify patterns and improve products and processes

VCST infused intelligence throughout their operations. Leveraging their unified IoT and PLM systems, they unlocked full transparency around quality. In conjunction with better processes for data capture, quality control, and corrective and preventative actions, VCST successfully raised the quality of their products. And by logging and executing changes faster across all their processes, VCST produces these higher-quality products at a faster rate, significantly improving their time to market. VCST anticipates improving time to implement a change by 25% and making significant reductions in mean time to repair.

The operational intelligence VCST gained was a huge benefit to customers seeking to reduce gear-on-gear noise. By tracking every aspect of production, VCST monitors and analyzes process data to identify potential sources of noise.

With these extensive records, VCST provides customers with the process data from their machines to help them search for causes to the noise. As a result, they've been able to implement concurrent engineering within the factory, fueling the innovation necessary to stay ahead of the competition.

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VCST improved OEE and reduced costs

VCST implemented powerful asset monitoring and utilization use cases to improve OEE. Real-time monitoring and diagnostics of their machines enables them to gain valuable visibility, avoid unplanned downtime, and maximize asset utilization. In addition to increasing the efficiency of their teams and improving OEE, VCST expanded the automation available throughout their plant. Their maintenance and quality checks are done through faster, more accurate workflows, resulting in improved output while still maintaining quality.

"Our teams will be able to work faster and more accurately than ever before. Since partnering with PTC and implementing ThingWorx, Windchill, and SAP, we can use our resources, time, and money in an optimal way," says Tim Polleunis, Smart Factory Manager at VCST.

VCST enabled continuous improvements and is already looking towards the future

While they're just finalizing implementation of their initial use cases for their Belgium factory, VCST is confident that they will see significant results around cost, quality, innovation, and time to market—results that they'll continue to build on in the future. They're well on their way towards their goal of delivering the best powertrain and brake components on the market.

Building on their success, VCST is already planning several more strategic initiatives in

partnership with PTC and Ad Ultima Group. They're in the process of implementing PLM software on their engineering side to further improve quality processes and change management. And using Creo, they've begun an initiative to complete all their designs in 3D by 2025. With the model as the leading element, stakeholders across the value chain will be able to visualize the evolutionary growth of data.

Another upcoming project revolves around Vuforia augmented reality tools. Leveraging Vuforia Exert Capture, they'll be able to create powerful step-by-step augmented reality (AR) instructions to help maintenance technicians get their jobs done quickly and accurately. And using Vuforia Chalk, they'll have quick and easy tools for remote assistance at their fingertips, especially in cases where partners are not allowed to travel. While these augmented reality use cases are still in early pilots, their value has already become clear.

"With the AR tools we've created, we can support people locally, from a global perspective, to show them how to do things and solve things. We learned that we have to invest even more in augmented tools," says Mr. Van Steyvoort.

Together, VCST, PTC, and Ad Ultima Group are continuing to forge a lasting and fruitful partnership. "All our customers are very excited about what we're doing. They're excited that VCST, PTC, and Ad Ultima Group are partners," says Mr. Van Steyvoort.

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