

Quant Transforms the Business of Factory Service with ThingWorx



quantPredict improves factory uptime and efficiency through data-driven insight.

For decades, Quant has been the partner of choice for over 400 industrial customers worldwide, including ABB Group, Dow, and Shell. Its full-service offering – assuming total responsibility for maintenance of industrial plants – helps its customers realize the full potential of their plants. Quant assists in everything from optimizing maintenance costs and improving plant performance to embedding superior safety practices and building a true maintenance culture.

Quant manages the maintenance spend through 70 Total Maintenance Outsourcing engagements in over 20 countries. Its 2,600 employees helped drive approximately €200 million in 2019 revenue.

Quant's core is transforming the business of maintenance for factory equipment, and by embracing the Industrial Internet of Things (IIoT), it is taking this mission to the next level.

Balancing Costs and Profitability

Quant does not own any machines, generators, pumps, or motors, nor does it sell any OEM equipment. Rather, its employees are its asset. Its typical engagement is a long-term contract which includes a Quant team embedded at a factory location or other site the company is maintaining. For instance, when Quant handles maintenance on the machines in a paper manufacturing factory, the multi-year, fixed-price contract includes outsourcing services, all on-site personnel, and spare parts.

In essence, Quant is proposing to own the maintenance department. In many cases, Quant takes on the people already working in these facilities. "Nobody knows the equipment like the people who work and deal with it on a daily basis so we want to preserve that institutional knowledge," explains Olof Hedin, Quant's Chief Digital Officer.

Quant layers in processes, management and in-depth knowledge of industry-wide performance to reach the mutually determined goals – or KPIs – in the agreement. Quant clients frequently propose a bonus model – usually based on safety and technical availability – to incentivize efficiency. When working with companies that are newer to outsourcing, Quant guides them on the contract structure and bonus model.

Ensuring Safety, Improving Productivity

Maintaining complex environments of remote and aging factory equipment is no easy task; among the many challenges Quant faces are ensuring safety and reducing maintenance costs.

"Safety first" is more than a platitude at Quant. Quant's safety-minded culture informs every action at the company, which conducts a personal security check at the start of each meeting. In many contracts, a strong safety-first mindset is already in place; in others, Quant's onboarding strengthens and professionalizes these practices.

Quant's ability to meet service objectives at lower cost directly impacts contract profitability. It's critical that Quant estimates with high accuracy the age, weaknesses and costs of factory equipment before it takes on a multi-year contract. If Quant can reduce plant maintenance expenses, it can optimize its customers' output and reduce its own costs – driving up profitability for both parties.

Going Digital to Transform Industrial Machine Maintenance

In most cases, Quant enters a factory using the same workforce and the same factory equipment. Its value is the ability to better manage these resources through data-driven insight. Quant embarked upon a digital transformation strategy in 2015 to help give it the operating levers it needed in diverse factory environments.

"A strong digital toolbox makes it possible to reach new productivity levels and build a knowledge base that is hard to replicate through solid maintenance processes alone," says Hedin.

Quant Smart Maintenance combines leading processes and methodologies, world-class safety stewardship, and a tailored digital platform. The solution manages a broad range of operational activities, including safety and sustainability, online Overall Equipment Effectiveness (OEE), value reporting, and big data analytics. A core component of the solution is Quant's condition-based and predictive maintenance application, quantPredict, powered by ThingWorx.

"We take full responsibility for delivering both uptime and value to our customers. We are in a unique position of delivering that because we have insight and experience across geographies and industries. Digital tools are increasingly a part of that," continues Hedin.

Capitalizing on IIoT with ThingWorx

quantPredict, powered by ThingWorx, integrates IoT data, alarming and alerting to transform accounts from reactive to predictive maintenance schedules.

Since Quant's customer base is so disparate – comprising companies of all types around the world – it was impossible to deliver a single predictive maintenance application to serve all customer needs. Instead, it needed to base the application on a flexible platform that enabled agility.

As Quant started looking at IoT platforms, it considered developing its own IoT capabilities on top of Microsoft Azure and Amazon Web Services, along with in-house solutions. Then it discovered ThingWorx from PTC, a best-in-class IoT platform featuring deep integration with the Microsoft Azure cloud.

According to Hedin, ThingWorx came out on top because it is a reliable, flexible and off-the-shelf IoT platform that includes analytics. Because ThingWorx is a common platform that integrates disparate systems and things, it's ideal for heterogeneous environments and situations where Quant isn't sure what equipment will be in place. "ThingWorx offers the ultimate in flexibility, which is precisely what we needed," continues Hedin.

Needing to deliver on an aggressive timeline, Quant engaged Novotek, a PTC partner based in Malmö, Sweden with extensive experience in industrial IT and automation. Quant was impressed with Novotek's solid references and willingness to share knowledge so Quant's developers could take over after the initial build. Within three months, Novotek helped Quant launch its first version of quantPredict predictive maintenance tool – based on ThingWorx on the Azure cloud – at the annual Quant conference.

Improving Outcomes with Conditions-Based Maintenance

With the quantPredict predictive maintenance tool, Quant has been able to upgrade many factories from time-based maintenance to condition-based maintenance. The majority of industrial equipment is legacy, so sensors must be added in the field. These sensors allow Quant to monitor factors such as vibrations and temperature, detect anomalies in production processes, and output alerts and performance insights to other Quant solutions. These include quantEffect, its OEE system, and quantWorx, its Computerized Maintenance Management System (CMMS).

For instance, sensors can monitor vibration and energy through an accelerometer. When a problem is detected with equipment such as a pump, fan or motor, quantPredict connects to the Quant CMMS tool, which generates a work order for service. The value for Quant clients is that they're able to use fewer maintenance resources while avoiding unplanned downtime.



Benefits in Action

quantPredict has been installed since January 2018 in a warehouse owned by a large manufacturer of appliances. The company's production process involves lifting and moving appliances on rollers and elevators that are sensitive to environmental conditions and prone to malfunction. Elevator outages slowed and even shut down entire production lines, dragging overall factory efficiency.

By installing sensors for vibrations and temperature, Quant was able to pinpoint the specific conditions that were advance markers for equipment failure. Armed with this insight, the company established alerts that enabled intervention prior to elevator failure. Moving from reactive to preventive maintenance decreased factory downtime due to elevator outages.

In another situation, Quant was engaged to maintain machines and systems for a mining company that experienced frequent malfunctions in its mine ventilation system and other critical machines. By using quantPredict, Quant's maintenance engineers were able to evaluate machine conditions remotely. Remote inspection gave the company the information they needed to develop condition-based inspection plans, with the potential to achieve 20% savings in preventive maintenance time and drive 10% gains in system availability.



We have changed the role of maintenance from a cost burden to a value generator, improving business for our customers. With solutions like ThingWorx, we are able to combine a tailored digital platform with our employee knowledge, leading processes and methodologies, and world-class safety stewardship to deliver better plant productivity and safety

Olof Hedin
Chief Digital Officer, Quant

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