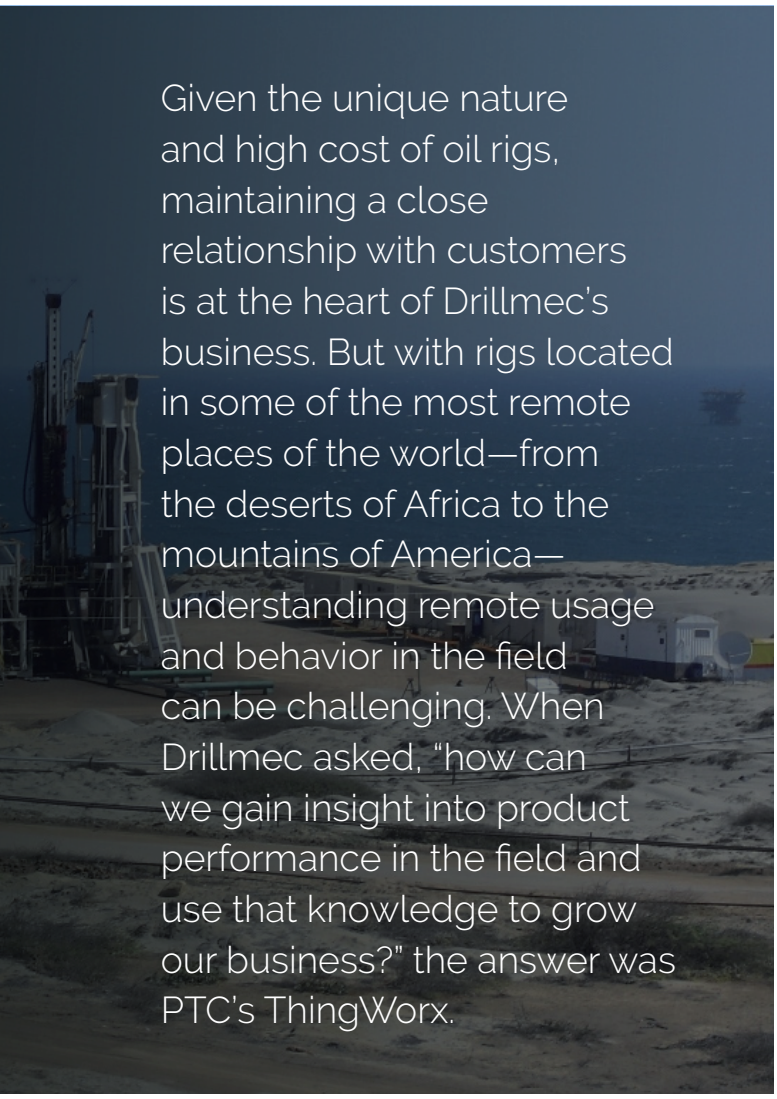
Drillmec Bores into the Future with IoT-enabled Insights

ThingWorx Powers the Next Generation of Service and Engineering Excellence in Oil and Gas Exploration



Given the unique nature and high cost of oil rigs, maintaining a close relationship with customers is at the heart of Drillmec's business. But with rigs located in some of the most remote places of the world—from the deserts of Africa to the mountains of America—understanding remote usage and behavior in the field can be challenging. When Drillmec asked, "how can we gain insight into product performance in the field and use that knowledge to grow our business?" the answer was PTC's ThingWorx.

An innovative leader in the oil rig and equipment industry

Drillmec is an international leader in the design, manufacturing, and supply of oil rigs. They specialize in rigs for onshore, offshore, and geothermal applications and offer a complete portfolio of drilling equipment. Headquartered in Piacenza, Italy, Drillmec is a global business, with operational centers and offices around the world. They were recently acquired by Megha Engineering & Infrastructures Limited (MEIL), a major company headquartered in India. Today, Drillmec's equipment and solutions are used on jobsites in more than 40 countries, with about 700 rigs in use around the world.

With more than 100 years of engineering excellence and industry expertise, Drillmec is committed to continuous improvement through innovation and the pursuit of efficiency. Drillmec has always been a pioneer in the oil and gas industry. For example, they were the first to introduce the hydraulic hoist rig—rigs designed to increase productivity, improve safety, and reduce environmental impact. Today, they are pioneering the integration of robotics and automation throughout their rigs to improve efficiency and

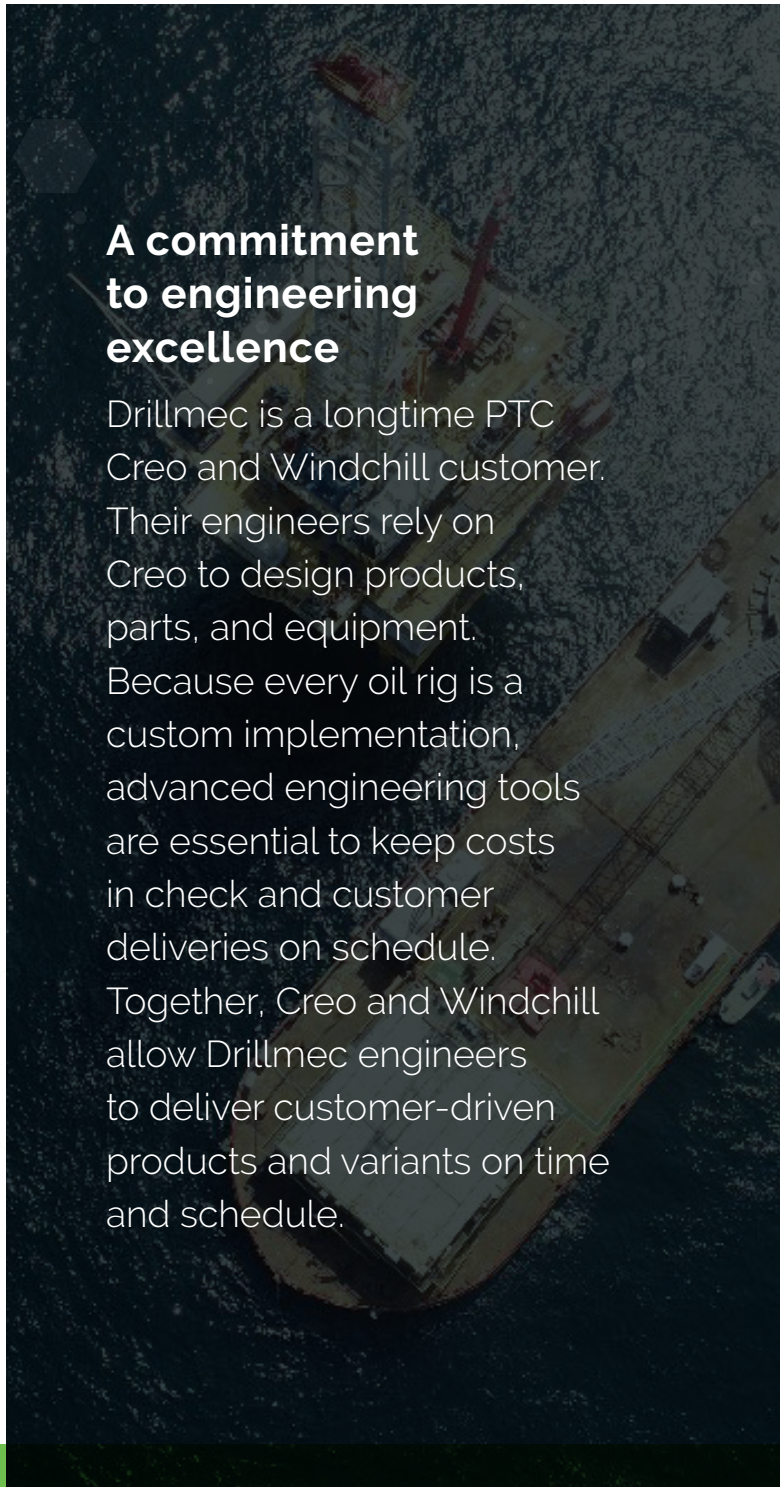
environmental sustainability with faster and safer operations. Additionally, they are helping digitize the oil field, building Real Time Operations Centers (RTOC) that enable continuous monitoring and remote support with smart glasses and drones in the field.

Drillmec's success is based on customer relationships

Every one of Drillmec's rigs is custom built in collaboration with customers—making their partnership with the client key to success. "Each rig is custom because each customer has their own requirements. Working closely and building rigs with clients helps us develop strong relationships and win new deals," says Francesco Curina, the Service Product Manager and Head of Training at Drillmec.

Equipment uptime depends on effective service and maintenance tailored to a customer's specific rig. Offshore rigs can cost about half a million dollars per day to run, and onshore rigs cost anywhere from 20 to 60 thousand dollars per day. As a result, a few days of downtime could significantly impact a project's overall economics—potentially tipping the scales from "money winner" to "money loser." Because oil rigs have at least a 25-year minimum lifespan, ensuring uptime throughout their lifecycle is critical to capturing total value.

To further ensure customer success, Drillmec must also consider the incredibly remote regions that their customers work in—such as jungles, mountains, or deserts. The environments typically impact every stage of the product life cycle, from initial rig design through aftermarket service and support. Furthermore, ensuring the right resources are supporting the right teams at the right time is a complex logistics exercise. Without operational insights, balancing resources is difficult to manage while maintaining a positive bottom line.



A commitment to engineering excellence

Drillmec is a longtime PTC Creo and Windchill customer. Their engineers rely on Creo to design products, parts, and equipment. Because every oil rig is a custom implementation, advanced engineering tools are essential to keep costs in check and customer deliveries on schedule. Together, Creo and Windchill allow Drillmec engineers to deliver customer-driven products and variants on time and schedule.

Drillmec leveraged ThingWorx IIoT to unlock powerful insights

Recognizing that opportunity begins with insight, Drillmec partnered with PTC to implement their ThingWorx IoT platform. ThingWorx is an end-to-end industrial IoT platform that provides visibility into production and asset health with a rich array of real-time data analytics and reporting. Using ThingWorx, Drillmec can connect to and unlock insights from a variety of PLCs and machines in a single, consolidated view.

"We've been collecting data for years. But with ThingWorx, we hope to collect data and use analytical models to predict failures. That's the main reason we chose ThingWorx: understanding all the data coming in," says Curina.

Drillmec is currently rolling out its first IoT-enabled rig in Peru, connecting upwards of 120 different data points with ThingWorx. They collect daily and hourly averages of parameters on equipment, while several are monitored continuously. Parameters center around key data points such as vibration and operation cycles. Because many of the rigs are in places without internet connections, Drillmec often collects data for analysis in batches. However, they've also created real-time alerts for three main types of data: temperature, oil level, and pressure.

Based on the insights uncovered in the field, Drillmec is exploring several key use cases: machine connectivity, remote monitoring and service, and training support. They also expect to see product development improvements from the solution.

Machine Connectivity

Machine connectivity provides the visibility into machine operating performance on which everything else is based. "It's so important for customers to understand how their machines are working. That starts with machine connectivity," says Curina.

For example, a ThingWorx dashboard could identify the location and operating status of every drill rig in the field, allowing customers and service teams to manage and iteratively improve OEE (overall equipment effectiveness), compare locations and vendors, and provide operational insights to their customers.

Remote monitoring and service

On the ThingWorx dashboard, technicians see what's happening in real time and get a better

understanding of the data being collected. With this information, they can help customers resolve issues and maintenance request.

Leveraging predictive maintenance capabilities, technicians would be able to anticipate events before they occur on the rig. This will enable them to repair and replace parts based on actual usage and nearness to failure, rather than a timed schedule. For example, analytics reveal the health of assets based on its temperature data over time. When failure is imminent, service technicians could then suggest a replacement part and help customers avoid downtime. These capabilities can also improve the customer's operational resilience by improving the performance of remote operations and lowering safety risk.

Training support

With ThingWorx, training staff could gain visibility into how equipment is working, so they can quickly understand whether trainees are using it incorrectly. This would enable Drillmec to provide more effective and tailored training, as well as shorten the training period.

Product development improvements

Drillmec engineers will be able to see how equipment works over a long period of time, gaining insight into key parameters, performance, system inputs and outputs, and more. If there is a failure, they would be able to look in the data logs and find out exactly what happened.

"One reason we want to improve our data management is to see how the client uses the equipment. We want to understand how our equipment works over a long period of time," says Curina.

Drillmec recognizes the impact of their IoT solution and expects to see significant results

While they are still in the early phases of their digital transformation initiative, Drillmec

already sees the value of the new IoT solution and expects to realize significant results going forward. Furthermore, Drillmec anticipates they will be one of the first companies to offer true real-time monitoring and predictive maintenance capabilities on their rig. "IoT is a really big part of our plans for next year. We will be one of two oil rig manufacturers that provide this type of service, which is a huge differentiator for our business," says Ferrandes. "For our customers, these capabilities are really important. It's like buying a car and knowing it will always be serviced at the optimal time, so it never breaks down."

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With their IoT solution, Drillmec is on track to realize the following benefits:

1. Improve service offerings and provide better support
2. Reduce customers' unplanned downtime
3. Prevent major failures, thus improving safety
4. Access all capabilities and insights through a "single pane of glass," rather than adding more siloed systems
5. Leverage insights throughout the rest of the business

Moving forward, Drillmec will connect new rigs and continue expanding use cases. They hope to roll out the new service offerings to all customers in 2021 and are currently in discussions with most of their customers. "The main objective is to connect the new rigs we roll out over the next few years," says Curina. "While we're only implementing the IoT-solution on new rigs now, we're planning to retrofit rigs with ThingWorx in the future."

Ultimately, Drillmec may be able to connect all their PTC solutions—including Windchill and Creo—to managing product lifecycle data within one system. For example, they could receive data from ThingWorx that a customer needs a new part, go into the spare part platform, order the specific part, and update the information across all systems.