ORACLE

Titan International Case Study

Ensuring business continuity with Oracle IoT Cloud

PURPOSE STATEMENT

This document provides an overview of the digital transformation journey of Tital International by harnessing the power of digital twin and predictive analytics of Oracle Cloud applications.

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> *We had multiple systems across our enterprise, and we needed to have perfect visibility to what was going on within our businesses. When we looked into improving our ERP and SCM processes and systems, we chose Oracle because Oracle was making a huge investment into the Cloud technology and it seemed the best solution for us. – Jeff Blattner, Director of IT, Titan International Inc.*

THE EMERGENCE OF SMART FACTORIES AND INDUSTRY 4.0

Industry 4.0 is driven by massive digital transformation in the manufacturing industry powered by the Internet of Things (IoT). Manufacturers are augmenting factories and machines with a network of sensors and intelligent devices collecting data to drive artificial intelligence (AI)-enabled insights, visibility, and predictive analytics.

The global study, Emerging Technologies: The competitive edge for Finance and Operations, surveyed 700 finance and operations leaders across 13 countries and found that emerging technologies (AI, IoT, blockchain, digital assistants and more) have passed the adoption tipping point. These technologies are exceeding expectations and creating significant competitive advantage for adopters.

The survey found that respondents who incorporated IoT data into their supply chain systems and workflows shortened their time to produce and fulfill orders by an average of more than six business days. They also reduced downtime by 26% and increased productivity by 76%.

Oracle's IoT Intelligent Applications Cloud offering includes a suite of applications, Asset Monitoring, Production Monitoring, Fleet Monitoring, and Connected Worker, that help customers maintain business continuity, improve efficiencies, achieve digital transformation, and enable complete IoT solutions across industries including healthcare, utilities, logistics, oil & gas, and manufacturing.

TITAN INTERNATIONAL'S JOURNEY WITH ORACLE CLOUD AND INTERNET OF THINGS

Titan International is on a transformation journey to digitize their manufacturing operations. Titan implemented Oracle IoT Intelligent Applications Cloud to drive real-time production planning and monitoring, helping them improve production scheduling and customer support. This involved implementing a software-as-a-service (SaaS) solution that provides real-time visibility of shop floor data, and automatic computation of key performance indicators (KPI) which helped the operations team to monitor production in real-time and, opens up possibilities for operations and productivity improvements in the future.

Figure 1: Titan International's wheel manufacturing facility in Quincy, Illinois, USA

The Challenges

Before implementing Oracle IoT Intelligent Application Cloud's Production Monitoring application, Titan International faced two major challenges:

Limited Production Visibility and Accuracy

- Low visibility into shop floor operations, causing shipment delays and backlogs
- Inaccurate inventory details due to human error
- Lack of real time data about the movement of wheels through the conveyors. Because of this, the shipping department could not accurately estimate completion time for customer pickups. This led to long wait times for trucks, bottlenecks, extra labor costs, and shipping delays.

Unplanned Maintenance

- Unplanned downtime disrupted regular maintenance and increased production urgency
- Lack of visibility into machine health led to manual maintenance schedules as opposed to automated schedules
- Inability to run predictive analysis to predict machine breakdowns

In addition to these challenges, Titan had disparate software solutions for scheduling, production completion, label printing, and time and attendance management - all of which hindered their ability to optimize production.

The business needed the maintenance team to focus on shop floor automation, with the ability to monitor machine health, preform analysis, predict failure, and optimize preventive maintenance schedules.

THE PHASED-APPROACH SOLUTION

The team at Titan International opted to implement Production Monitoring to address their visibility, tracking, and integration issues. One of the main reasons they chose Oracle IoT Intelligent Applications Cloud was the seamless integration between Production Monitoring and Oracle Manufacturing Cloud.

At Titan's Quincy plant in Illinois, sensors and programmable logic controllers (PLCs) are installed in the shop floor. With the help of IoT, the devices are brought to life, providing opportunities to automate manufacturing and monitor machine health. The continuous flow of data helps the machine learning algorithms to process and predict the health of the machines.
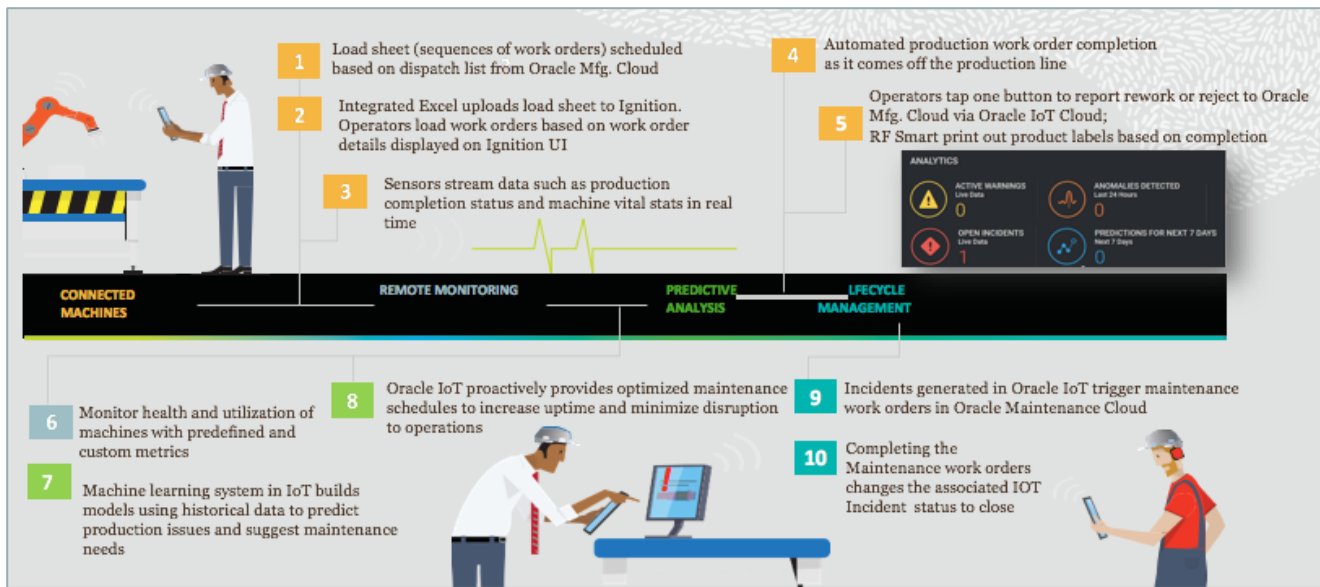
Figure 2: Solution Overview of a Connected Factory

Titan International worked with their system integrator partner, Deloitte, to implement Production Monitoring in three phases:

Phase 1 — Plan Pilot and Go Live

The first phase achieved the following objectives:

- Production Monitoring went live on a single production line: the paint line for shop floor automation
- Titan achieved immediate and automatic completion of work orders
- Seeded digital twin simulations provided solution-building and testing

With the positive outcomes from Phase 1, Titan felt confident to proceed with their vision for the smart factory. They decided to expand the Oracle's IoT solution into additional production lines at the Quincy, IL plant.

Phase 2 — Scale Automation

The second phase achieved the following objectives:

- Fifteen additional production lines went live, including two paint lines and 13 rim lines
- Titan averaged three go-lives and six production lines every two months, along with process and technology standardization
- The integrated solution provided real-time reporting of scrap and rejections, automated and flexible product label printing, on-line communication between production lines, and accurate ETA data for the shipping team to schedule customer deliveries

Standardizing technology and processes helped Titan monitor all production lines with standardized metrics, helping them improve on-time customer deliveries.

Phase 3 — Optimize Factory Uptime with Connected Machines

The third phase of the implementation will focus on the following objectives:

- Parallel go-lives for machine health monitoring
- Pilot go-lives with selected device monitoring, such as paint line, oven temperatures, and drive motors
- Achieve exception-based management, diagnose the root causes for unplanned downtime, and use predictive analytics for better maintenance management

Titan International sees Industry 4.0 as a continuous journey to maintain their competitive position. They're seeking to continuously identify opportunities to meet critical business needs, explore technology solutions, deploy them in a phased approach, and help

enhance their factory staff's experience and production levels. Oracle's long-term commitment to investing in, and continuously updating cloud technologies was one of the key reasons that Titan International selected Oracle as its technology partner.

THE DELIVERY OF BUSINESS VALUE AND MEASURABLE BUSINESS METRICS

Teams from Oracle IoT product management, Titan International, and Deloitte collaborated closely to successfully implement the first and second phases of Titan's digital journey. The business metrics and associated targets were set based on critical business needs and became the guiding principles for all decisions made during implementation planning. The new processes and systems are helping Titan to:

- Track real-time production planning and monitoring using work orders
- Provide mobile or tablet-based communication and decision-making capability, backed by PLC reports
- Generate data-based KPIs to drive management decisions

Figure 3: Titan International's Business Metrics

CLOUD, IOT, AND ARTIFICIAL INTELLIGENCE MAKING BUSINESSES MORE AGILE

The ongoing journey of Titan International towards completely digitizing their manufacturing processes is a compelling testimony to the competitive edge that manufacturers can gain with the power of Industry 4.0. As more systems and devices get connected to IoT, the manufacturing industry will continue to evolve into fully automated units. Artificial intelligence, machine learning, and data science capabilities embedded into applications and processes will deliver advanced insights, helping to drive production lifecycles, supply chain management, and enterprise performance management.

> Most important factor that we had when selecting an IoT solution was that we wanted a package that was going to grow with us, and we wanted something that was maintainable and upgradeable, not something that was going to be a custom application. We chose Oracle because we had multiple systems across our enterprise so we had perfect visibility into what was going on within our businesses. When we looked at what we wanted to do, Oracle was making a huge investment in cloud technology and it seemed like the best solution for us. – Jeff Blattner, Director of IT, Titan International Inc.

You can check out the video of Titan International using Oracle IoT Intelligent Applications Cloud.

For additional information on Oracle IoT Intelligent Applications Cloud Applications, please visit www.oracle.com/IoT.

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