Factory Insights as a Service

Introduction

Now more than ever manufactures are accelerating their digital transformation initiatives. According to Forrester, 91% of manufacturers feel that digital transformation is a top initiative for manufacturing operations and nearly 3 quarters of executive respondents expect significant business impacts from these efforts in the next 2 years.[i]

While the potential to create value and competitive differentiation is undeniable, few initiatives deliver these transformational benefits to the organization. Even though 87% of decision-makers know it's important to scale applications across all factories, only 16% of all proof of concept (PoC) initiatives have been rolled out enterprise-wide over the past two years."

Many of these get stuck in pilot purgatory, never breaking through this initial PoC stage to provide production level impact. For those initiatives that reach production, they often get stuck in a form of scale purgatory: where the success realized at one site cannot be duplicated across additional ones. Custom, bespoke implementation approaches mean that each implementation is lengthy and tailored to the infrastructure environment at that site. Wildly variable data and infrastructure environments across sites mean that each implementation starts over make scaling across multiple sites lengthy and complicated. The net result is that companies are unable to deliver transformative impact in an agile manner, fail to show value from the overall transformation initiative, and lose momentum on digital transformation.

[i] Drive Transformational Outcomes at Scale: Breakthrough pilot purgatory and capitalize on impact, with speed and at enterprise scale," a commissioned study conducted by Forrester Consulting on behalf of PTC, Microsoft, and Rockwell Automation, December 2020

Factory Insights as a Service

Factory Insights as a Service helps companies break through pilot and scale purgatory so that they can deliver digital transformation with accelerated time to value and time to scale. This SaaS based solution enables manufacturers to rapidly build a foundation for digital transformation that provides insights to performance, assets, and the workforce. It utilizes high impact use cases that replace custom, bespoke approaches with repeatable, configured, not coded, applications that leverage the domain expertise from hundreds of successful implementations. These vastly reduce the effort associated with designing, coding and testing new applications. As a result, companies can:

- Rapidly deploy to improve time to value
- Scale digital transformation across the enterprise in a fraction of the time

Factory Insights as a Service includes many of the key product components of FactoryTalk® InnovationSuite (from PTC and Rockwell Automation) and leverages domain expertise gathered from hundreds of implementations. It leverages Microsoft technology including Microsoft Azure IoT Hub & Azure IoT Edge, enabling manufacturers to rapidly connect individual sites, enhance multisite rollout, improve edge compute capabilities, and advance edge security.

Key Capabilities

- **Rapidly deployed & configured SaaS offering** – Takes advantage of industry leading technologies from PTC, Rockwell, and Microsoft: ThingWorx, ThingWorx Kepware Server, Vuforia Expert Capture, FactoryTalk InnovationSuite powered by PTC, Microsoft Azure IoT Hub and Azure IoT Edge.
- **Ready to configure applications** – Significantly reduce time needed to design code & test applications.
- **Rapid implementation** – Configure-not-code approach configuration services get you started in as little as 90 days.
- **Wrap & Extend** – Factory Insights as a Service solution works with your existing systems and infrastructure. No need to rip and replace.
- **Future-proofed roadmap for continuous innovation** – The high impact use cases align to the most common requirements. This enables companies to rapidly create a foundation for digital transformation. Using our scalable, extensible platform, they can iteratively extend into additional digital transformation use cases.
- **Secure & scalable Microsoft Azure IoT clou**d – Utilizing native Azure security, customers can help reduce security risk in edge manufacturing environments. Azure backbone bypasses OT variability between sites and accelerates ability to scale.
- **Robust ecosystem of global system integrators** – Leverage a robust system integration community to further accelerate time to scale.

Up to **90%** reduction in application development time & cost

As much as **75%** faster time to value

As much as **67%** reduction in time to scale

Service Application Breakout

Real-time Production Performance Monitoring (RTPPM)

As companies take measures to continuously improve operational performance, understanding and comparing true, current performance across lines and assets is key. Unfortunately, the timeliness of information and different interpretations of performance make it difficult to understand current performance, determine where to take action to improve OEE or compare performance across products, lines or assets.

Real Time Production Performance Monitoring provides manufacturing executives and plant managers with top-down, real-time visibility into consistent KPIs such as overall equipment effectiveness, mean time between failure, and mean time to repair. The KPIs can be calculated from data pulled from automation systems, IT systems, as well as manual data entry from operators for additional reason codes.

This allows companies to move beyond asset oriented OEE to understand and compare performance across assets, lines, or products based on date, time, shift or crew. They can easily spot trends and drill down into causal events to identify key losses to remediate.

Call out data points for RTPPM

- 5-20% increase in OEE
- 2-10% increase in yield.

Asset Monitoring and Utilization (AMU)

For manufacturers with asset intensive operations, uptime and availability are mission critical; but it is often challenging to connect to existing assets, continuously monitor the parameters that impact asset health and performance, and alert on critical issues before they impact performance. The inability to monitor these assets results in more frequent events with longer unplanned downtime, higher scrap & rework, higher maintenance costs, lower overall asset utilization and unnecessary capital expenditures.

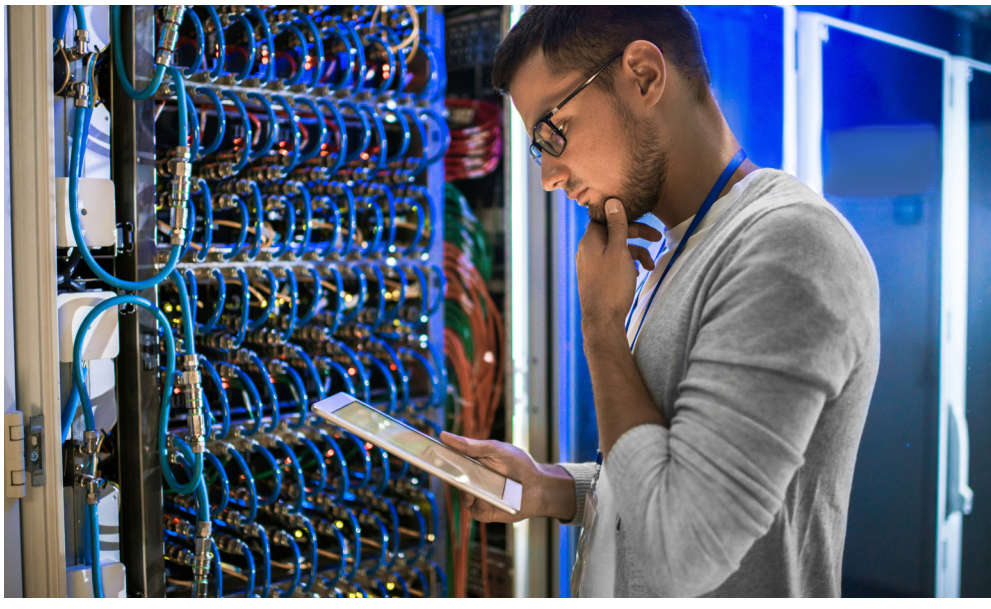
Asset Monitoring and Utilization helps manufacturers connect to existing assets, remotely monitor them in real-time, generate alerts based on abnormal conditions, and deliver critical insights with data trending and analysis tools. The performance dashboard provides real-time access to each monitored asset including detailed drill downs into asset health, open alarms and performance readings for selected properties and sensors.

They can also establish complex alarms, with condition types, boundary limits, actions associated with those alarms, email and SMS distribution rules for messaging, acknowledgment options, and reporting to drill down into root causes for high priority alarms.

With integration to maintenance systems, maintenance and reliability engineers can rapidly connect to and catalog assets, establish critical parameters needed to track asset-related performance, identify anomalous data trends, troubleshoot for root cause analysis, and access performance information from any device.

Call out data points for AMU

- 5-20% increase in throughput
- 20-30% reduction in unplanned downtime
- 2-13% reduction in energy consumption



Connected Work Cell

Frontline workers are at the heart of manufacturing but, with increased pressures for productivity, more products to support, more assembly options per product, and fewer operators in total, the job itself is highly complex and often almost impossible. They are asked to bring information together from a wide variety of sources like tools, machines, and ERP systems. They then assemble products with paper-based instructions and manually validate assembly in paper travelers. This results in inefficiency and inconsistency across production.

Frontline workers may rely on their personal preference over the printed work instructions, the assembly workflow may be inconsistent across this community, less experienced workers take a long time to upskill, assembly instructions themselves may be out of date, and throughput and quality are impacted. The net result is lower overall production effectiveness (OPE), lower overall labor effectiveness (OLE) and higher scrap & rework.

Connected Work Cell streamlines how information is delivered to frontline workers by aggregating critical data from multiple data siloes into a simplified visual application. It presents step-by-step work instructions with accurate, up to date information to drive efficiency, links instructions to work orders, assigns resources, and validates proper execution to ensure quality. Since the work cell now pushes the process and steps to operators, it makes frontline workers more flexible with lower need for upfront training and upskilling before being assigned to a new work cell. Integration with connected tools provides bi-directional communication to both download tool settings and collect actual tool data for traceability.

Call out data points for Connected Work Cell

- 10-40% increase in worker productivity
- 30-65% reduction in training time
- 3-25% reduction in scrap

Digital Work Instruction

As manufacturers deal with an ageing workforce and high turnover, it is critical to get new hires up to speed and to upskill their existing workforce. Unfortunately, many manufacturing facilities rely on manually authored work instructions to drive consistency & productivity in product assembly. New factory workers assemble products with manual, paper-based instructions that may be out of date, are not intuitive and time-consuming to create.

This results in slower production and less effective upskilling. New workers have difficulty getting up to speed on processes, instructions may be limited to one language, inhibiting non-native speakers, and manually created instructions can quickly become outdated and are prone to human error. The net result is lower productivity and higher incidents of scrap and rework.

Digital Work Instruction addresses these problems. This solution provides operators with an online, augmented reality based visual approach to instructions, which replaces the need for paper-based documentation. It empowers companies to continually author and change these instructions as needed. Where companies leverage PLM to maintain the component inventory, Factory Insights as a Service can integrate to create dynamic instructions. Augmented reality unlocks a new standard in training, that helps new employees and non-native speakers with a visual approach to learning.

Call out data points for Digital Work Instruction

- Up to 30% reduction in downtime
- Up to 25% reduction in scrap & rework costs
- Up to 50% reduction in training costs

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To learn more visit:
www.ptc.com/factory-insights-as-a-service

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