How manufacturers can use untapped insights to improve efficiency

Fierce competition, thin product margins, aging fleets of factory assets and fast-changing customer choices are putting manufacturers under tremendous pressure to re-think their operations strategy. Running cost-effective operations through Lean Six Sigma within the four walls of your plants, or selecting low-cost plant locations, are no longer enough to impact company growth in this hypercompetitive global market. Senior operations executives must think differently and consider innovative approaches to predictive maintenance.

The main challenges that affect profitability in the manufacturing industry are unplanned downtime and asset failure. These challenges stem from the lack of transparency into machine performance required to predict and prevent failures in the factory or across plants. Companies can minimize the risk of unplanned downtime by predictive maintenance through digitalization. Predictive maintenance techniques are designed to help determine the condition of in-service equipment to determine when maintenance should be performed. This analytical approach promises cost savings over routine or time-based preventive maintenance because tasks are performed at the right time – not too early or too late.

Currently, most manufacturers take a reactive maintenance approach using legacy, in-house applications. These aging, homegrown applications with limited functionality and usability tend to strain companies by requiring designated IT professionals to build, maintain and keep the applications relevant to the evolving industrial factory. Moreover, this run-to-failure and break-fix maintenance approach only provides partial operational transparency, leading to higher operations costs and unplanned downtime across multiple assets. Improved understanding of the root cause of quality and production issues leading to higher asset uptime, higher utilization, lowered material costs, greater yield and lowered maintenance costs has become a strategic imperative.

Along with unplanned downtime, premature service at a higher frequency than required negatively impacts maintenance costs. By listening to their products, plants, systems and machines, manufacturers have unprecedented transparency to manage maintenance with real-time Internet of Things (IoT) data. The goals of predictive maintenance are first to predict when a specific asset failure might occur, and secondly, to prevent that failure by performing maintenance on the asset with proactive planning. Ideally, predictive maintenance allows the maintenance frequency to be as low as possible to prevent unplanned, reactive maintenance.
Perform maintenance at the right time
Leading manufacturers are using predictive maintenance to proactively manage their asset health, thus reducing downtime and expensive dedicated equipment-health management. With the continuous collection and intelligent analysis of operating data from IoT-ready sensors, digitalization has opened up entirely new possibilities with advanced analytics and data collection from connected assets. Data-driven insights make it possible to predict the best time for maintaining machine and plant components at the right frequency and before unplanned downtime. To enable machine and plant operators achieve significantly higher productivity, manufacturers are taking advantage of vendor-provided IoT platforms to offset the costs of IT infrastructure, programming tools, analytics services and more as operational expenses with minimal or no capital expenditure. These companies are focusing on value-added activities around their core competency rather than IoT platform development and maintenance. It is now imperative to select an end-to-end IoT solution to immediately begin collecting and monitoring machine data to achieve full operational transparency.

Expanding performance, scalability, visibility and insights with MindSphere
MindSphere, the cloud-based, open IoT operating system from Siemens, offers an end-to-end solution from connectivity to analytics, including various industry-specific applications and solutions to address predictive maintenance. MindSphere solutions are designed to remove much of the effort, time and expense of building into machines the sophisticated features and capabilities that can be easily extended to meet your company needs, such as turnkey analytics and Fleet Manager that come as standard capabilities with MindSphere. With MindSphere, your IT teams and developers don't need to program IoT solutions from scratch. Using machine learning and deep learning techniques, MindSphere enables you to perform maintenance at a scheduled point in time when the maintenance activity is most cost-effective and before the equipment loses performance within a threshold. This results in the reduction of unplanned downtime where costs can be in the hundreds of thousands per day, depending on the industry.

The cloud computing that MindSphere provides is already embraced by IT groups and developers in companies worldwide with:

- **On-demand IT infrastructure** that is always up-to-date and highly secure with virtually limitless scale and no difficulty with maintenance, patches, updates, security and other ownership responsibilities
- **Capital expense savings**, plus savings in time, effort and skills to acquire, deploy, commission and maintain needed hardware

“Currently, 85 percent of potential assets remain unconnected…”

World Economic Forum 2017
- **Flexible pay-as-you-go cost models**, via consumption-based pricing, help to avoid up-front capital costs of hardware, while aligning costs with usage – a model that can pass through to customers as both a benefit and a competitive differentiator.

- **Cost-effective access** to Platform-as-a-Service (PaaS) functions, such as high-performance computing, and Software-as-a-Service (SaaS) applications, such as advanced data analytics built on MindSphere. Open standards and interfaces give customers the flexibility to gather data and match their solutions with their customers’ infrastructure regardless of whether the equipment was manufactured by Siemens or third parties.

- **Access to a world-class partner ecosystem** to address the broad scope and high complexity of business requirements across all industries. MindSphere has established an extensive network of world-class partnerships with broad domain expertise and IT capabilities to provide a robust offering of IoT solutions and services with the flexibility to match their solutions with customers’ requirements.

**Now is the time to start your IoT journey**

The trend toward digitalization of the world’s industrial plant facilities is already in motion and companies must get started quickly to remain profitable and competitive. Operators can connect, collect and analyze data from aging as well as leading infrastructures to immediately monitor machines in one centralized location. Not only are the current operational costs of outdated machinery mounting in terms of more frequent maintenance, repairs, onsite replacements and hard-to-find spare parts, but the engineering and maintenance know-how is also quickly retiring.

With MindSphere and IoT data, customers can begin their own digital transformations in these ways:

- Deliver operational transparency with predictive maintenance across products, plants, systems and machines
- Optimize asset utilization to ensure maximum uptime and availability
- Increase maintenance efficiencies with service at the right time
- Drive cost-effective, flexible and scalable solutions as your business needs grow with no operational interruption
- Leverage data availability and centralized key performance indicators (KPIs) for greater operational insights and accountability

With Siemens and MindSphere, manufacturers of all sizes can now capitalize on IoT data. It can help open doors to new markets, including international ones, thanks to the global reach of the cloud. And MindSphere is supported by Siemens’ domain expertise, sales and professional services as well as a world-class global partner ecosystem. To benefit from increased operational transparency and machine uptime, contact your local Siemens representative or global partner, or visit the Siemens website to learn more.