Realistic IoT vs. visionary IoT

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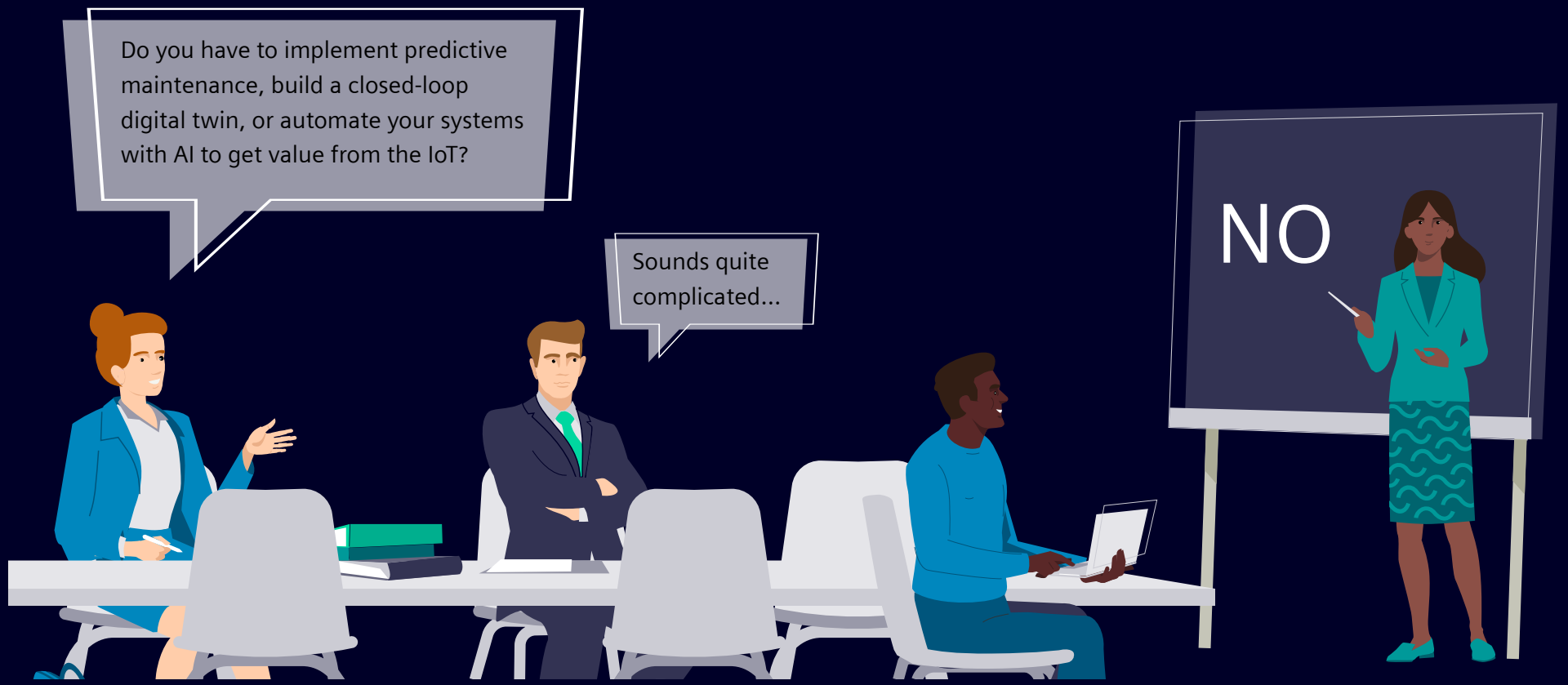
Realistic IoT vs. visionary IoT for machine builders

When you hear about the industrial Internet of Things (IoT) and the ways it can improve your operations and services, it can feel overwhelming. Especially if you're just starting.

IoT is often portrayed to be the answer to all of life's problems, with endless AI, machine learning and closed-loop digital twin capabilities. With all these possibilities, it's hard to separate what's realistic to achieve in the short-term, and what's more visionary for the future.

But how accessible is it to implement predictive maintenance, build a closed-loop digital twin, or automate your systems with AI? Do you even have to do any of those things to get value from the IoT?

The answer is a resounding no.



How do marketers talk about the industrial IoT?

They go visionary

They will say things like: *We are in the age of rapid, efficient, and data-driven digitalization: modernizing technology through connectivity, revolutionizing industry through feedback immediacy, and impacting countless through cloud-based communication and adaptability. It all starts now, with the industrial IoT.*

In fact, the industrial IoT (IIoT) is the inevitable future of manufacturing operations. By providing the capability to capture, store, process and analyze unthinkable amounts of data, it is the industrial IoT that opens the door for complete asset transparency, remote condition monitoring, predictive maintenance, new service models, the closed-loop digital twin, system of systems, and much more. It is through IIoT that small- and large-scale processes can be augmented, enhanced, and implemented to optimize the efficiency of every manufacturing plant.

"The IoT Platforms [solutions] market between 2015 and 2020 grew to be $800 million larger than we forecasted back in early 2016, resulting in a staggering 48% CAGR." [1]

Why do they go visionary?

Why do people speak in visionary language? Because the IoT is capable of game-changing efficiency and productivity, and the more complicated and powerful the use case, the more mind-bending the value can seem.

But what marketers and solution providers fail to communicate, is that **you do not have to climb Mt. Everest to get substantial value from the IoT.**

Start with the most basic of capabilities to get the foundation, ROI and confidence that you need in order to grow into the more complicated, "visionary" use cases.

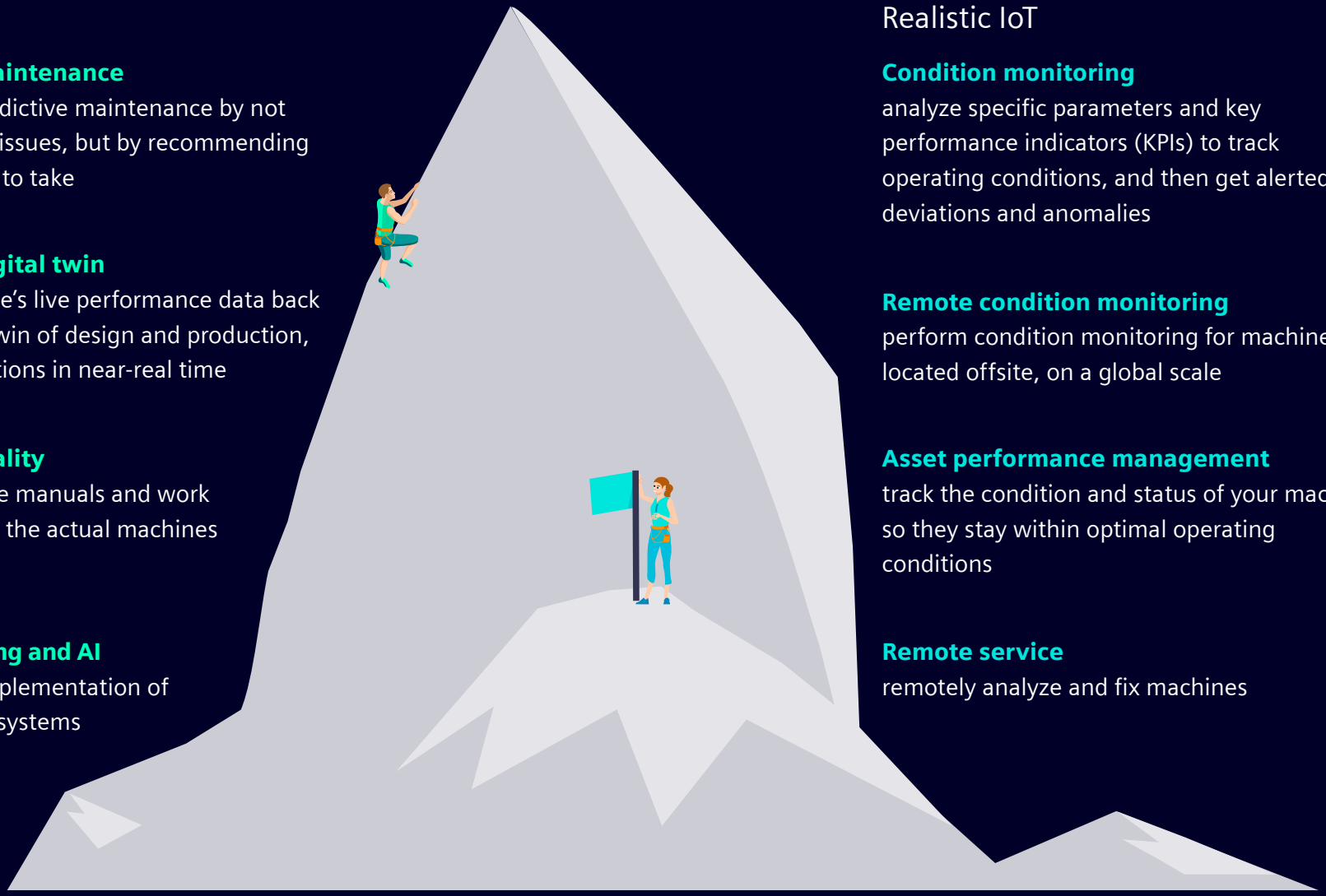
Visionary IoT

Prescriptive maintenance
goes beyond predictive maintenance by not only forecasting issues, but by recommending the right actions to take

Closed-loop digital twin
pushes a machine's live performance data back into the digital twin of design and production, updating simulations in near-real time

Augmented reality
provides machine manuals and work instructions over the actual machines needing service

Machine learning and AI
facilitates the implementation of fully automated systems



Realistic IoT

Condition monitoring
analyze specific parameters and key performance indicators (KPIs) to track operating conditions, and then get alerted of deviations and anomalies

Remote condition monitoring
perform condition monitoring for machines located offsite, on a global scale

Asset performance management
track the condition and status of your machines so they stay within optimal operating conditions

Remote service
remotely analyze and fix machines

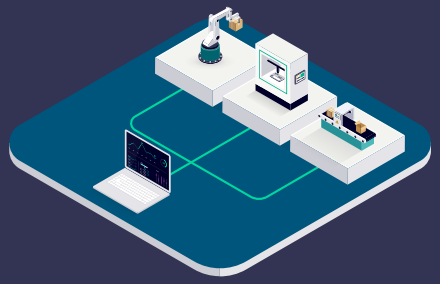
Start simple: life is complex enough

Because of all the powerful capabilities an IoT solution possesses, it is easy to believe that getting started with any form of the industrial IoT is complex, expensive and resource heavy.

But with the right solution and strategy – **it shouldn't be any of those things.**

Not **Complex**

The right solution allows you to start with a small proof of concept, and then securely and easily scale when you're ready. Your implementation should be as gradual or fast as you need.



Not **Expensive**

When you start small and prove value before jumping "all in," your upfront expenses dramatically reduce. It's even better to have a solution that allows you to slowly scale up and down at your pace.

Not **Resource heavy**

The right solution eases the burden on your employees. Out-of-the-box connectivity, ready-made applications, and resources for low-code application development remove the need for large teams to manage implementation. Further, starting small allows you to plan and align your strategy before things get uncontrollable.

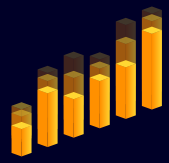
Realistic IoT you can achieve in weeks: Remote condition monitoring

Once your machines are connected and you have transparency into the data they are producing, the best place to quickly realize realistic IoT is with remote condition monitoring and remote service.

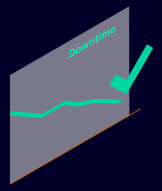
Remote condition monitoring involves connecting to the sensors on sold products through IoT, and then remotely tracking how and when the product is being used and how it's performing.

Not only is this use case able to be implemented quickly, but it directly offers solutions to the challenges manufacturers face:

- With globalization and low barriers to entry, products are commoditized. Trying to differentiate on just function/feature or price is not a successful long-term strategy. IoT-enabled service offerings can set you apart.



- More and more, customers do not want to buy products; they want to purchase outcomes. Being able to lease products and charge by use is quite attractive.



- The cost of downtime for machines or systems can be brutally expensive. The IoT can nearly eliminate scheduled maintenance and unexpected failures of machines/products in the field, giving you an edge on competition.

With insight into the machine data, sellers can start creating KPIs and benchmarks and offer unique services to their customers, such as maintenance as a service, optimization as a service, pay-per-use leasing and dynamic warranties.

The heart of your digitalization journey lies in achieving this use case and showing real value.

A simple, but powerful solution
Integrated remote condition monitoring + remote service

MindSphere®, the industrial IoT as a service solution from Siemens, not only provides off-the-shelf solutions for remote condition monitoring, but it uniquely includes remote service.

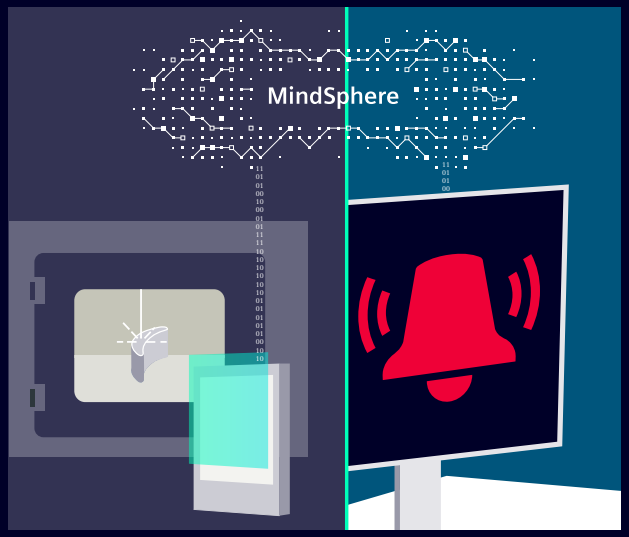
The additional remote service capabilities allow machine builders or system providers to remotely service machines. This reduces downtime and cuts travel expenses: if a software fix can be implemented, the technician can do it off-site.

MindSphere offers integrated remote service with condition monitoring through the Asset Health and Service Hub solution. Here's a quick overview of how it works:

1. Data sent to MindSphere is constantly monitored and analyzed, looking at defined KPIs. When an anomaly is detected, the service engineer is alerted to investigate.

2. Using the stored process data, the service engineer performs a root-cause analysis to determine what the issue is, as well as remotely accesses the machine for further diagnostics.

3. Once the issue is understood, the service engineer can remotely repair software issues and identify if any hardware service is needed onsite.
   - If service is needed at the factory, parts can be ordered as-needed and maintenance can be performed at the best time for the customer. This proactive problem detection decreases unexpected failures.



A machine is showing an alarm for the "endpoint of circle" – which indicates a CNC machine is not able to construct a circle correctly given its current program parameters.

Through further analysis, the service engineer uncovers that the parameters given for the circle construction do not work.

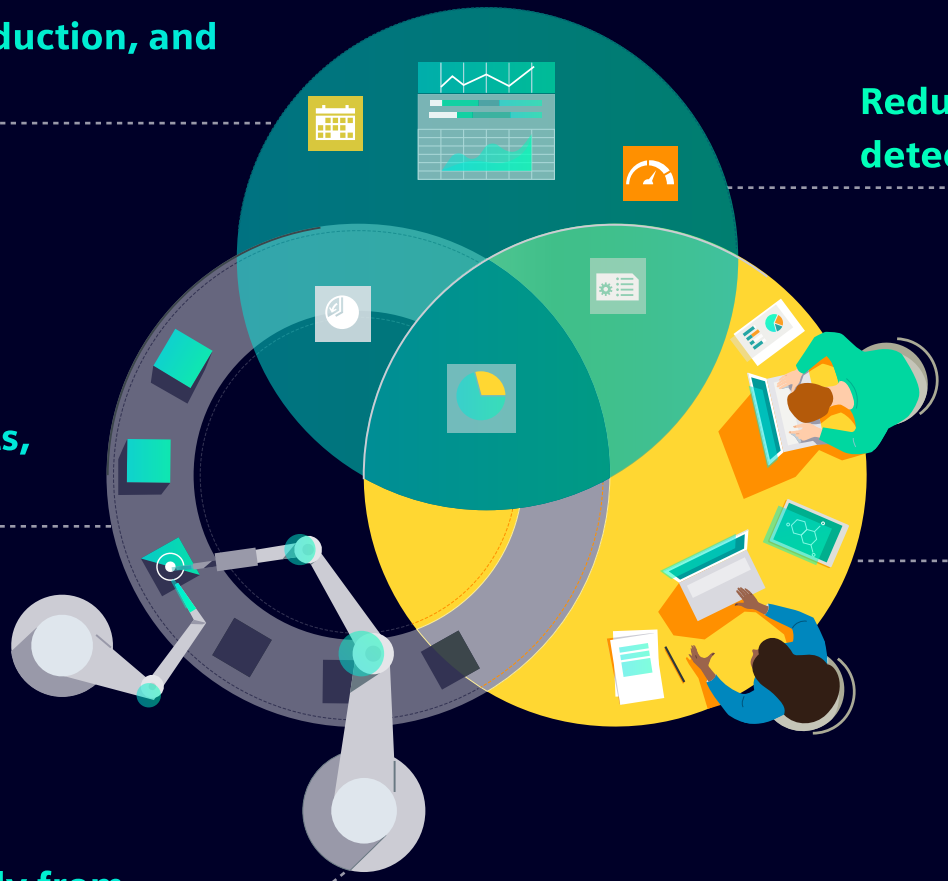
Because he has remote service capabilities, he changes the NC program parameter and sends it to the machine. After testing the new parameters with an onsite operator to confirm it works, the service engineer can then proactively check the status of other sold machines and make the necessary adjustments for other customers.

Benefits of the MindSphere solution

Overall, remote condition monitoring provides unparalleled benefits when coupled with remote service, allowing for...

Scheduled maintenance without interruption of production, and only when needed

Reduction in time between detection and solution



Ordering of spare parts, as needed

Remote services

- The ability to remotely repair, update, or interfere with machine parameters immediately
- Prevent unscheduled downtime
- Reduce travel cost with remote diagnosis and repair
- Focus employees on high-value activities

Feedback directly from field to engineering

More information

To get started with realistic IoT, try a free MindSphere account:
mindsphere.io/start/industry

To learn more about the industrial IoT, visit:
siemens.com/mindsphere

References:
[1] IoT Analytics: "5 Things to Know About the IoT Platforms Market"

About Siemens Digital Industries Software

Siemens Digital Industries Software is driving transformation to enable a digital enterprise where engineering, manufacturing and electronics design meet tomorrow. Xcelerator, the comprehensive and integrated portfolio of software and services from Siemens Digital Industries Software, helps companies of all sizes create and leverage a comprehensive digital twin that provides organizations with new insights, opportunities and levels of automation to drive innovation. For more information on Siemens Digital Industries Software products and services, visit siemens.com/software or follow us on LinkedIn, Twitter, Facebook and Instagram. Siemens Digital Industries Software – Where today meets tomorrow.

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