



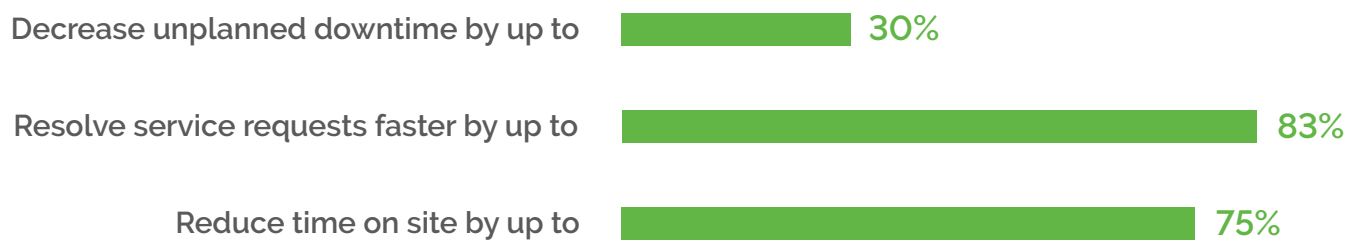
# Success Guide for Predictive Maintenance

WHITE PAPER



Unplanned downtime is the enemy of efficient service. When technicians are forced to react (rather than predict), the resulting service is expensive, inefficient, unsustainable over time, and harmful to customer relationships. [Predictive maintenance](#) provides actionable insights to predict and resolve equipment issues before they result in costly downtime—but the perceived mystery behind data science and AI can be daunting enough to deter service organizations from pursuing a predictive maintenance solution. How can you move past AI's difficult reputation and harness it to gain real, tangible results?

## WITH PREDICTIVE MAINTENANCE, SERVICE ORGANIZATIONS CAN



By following the right steps with an experienced Internet of Things (IoT) partner, you can implement predictive maintenance to decrease unplanned downtime by up to 30%, realize up to 83% faster service resolutions, and spend up to 75% less time on site<sup>1</sup>.

## Prepare for Implementation

Before you and your team begin implementing an IoT-driven predictive maintenance strategy, you'll likely need to build consensus, alignment, and even virtual teams to ensure success. To secure enterprise-wide buy-in, your colleagues will likely need a clear picture to understand how predictive maintenance directly improves equipment uptime, service efficiencies, and customer relationships.

<sup>1</sup> [ptc.com/en/solutions/reducing-operational-costs/field-service-cost/predictive-maintenance](https://www.ptc.com/en/solutions/reducing-operational-costs/field-service-cost/predictive-maintenance)

## Understand Predictive Maintenance

What if your team knew, in advance, that a vital piece of equipment would soon fail? That insight would be valuable information to act on—and would prevent costly downtime for your customers. But without prediction, reactive, inefficient service—and unhappy customers—are more likely.

When it comes to understanding predictive maintenance across your executive team, it's important to understand that data science and prediction aren't the mysteries they seem to be. That's because you and your team are already predicting based on what you know. The only difference is that IoT enables service organizations to predict based on what they learn and what they simulate. Those are the critical insights that drive key business benefits like cost-savings and long-term customer trust.

## Identify the Machine Condition for Prediction

What is the machine condition (or conditions) that, if disrupted, poses the greatest cost to your customers? R&D, engineering, and service teams must work together to identify the data, determine what's important, and develop a plan to access that data.

*The success of your predictive maintenance implementation relies on the people who will be using the technology and making predictions on a day-to-day basis.*

## Get Enterprise-Wide Buy-In

At this point, you've built a business-oriented use case that aligns with day-to-day challenges being faced across the enterprise. Getting support for the corporate use case is critical, but not enough on its own. The success of your predictive maintenance implementation relies on the people who will be using the technology and making predictions on a day-to-day basis. That's why it's crucial to get buy-in from the end users—and modify the workflows to be impacted by this new model—to ensure they develop the understanding and the confidence to act on IoT insights for valuable predictions.

## Choose a Partner

Finally, a critical step in preparing for predictive maintenance implementation is choosing the right IoT partner to have by your side throughout the process. Once you've cultivated executive support for predictive maintenance across the organization, identified the machine condition for prediction, and secured enterprise-wide buy-in, partner with experts that have a background in implementing IoT for predictive maintenance.

Service organizations should look for IoT partners that can provide the support structure needed for predictive maintenance implementation, offering experience with:

- Data selection
- Model building
- Analytics
- Data collection and management strategy
- Data architecture, design, and governance
- Simulation expertise
- Ecosystem availability

## Build a Predictive Model

Your partners in predictive maintenance can help you find the right technology to build a predictive model and get valuable insights to speed service and reduce downtime.

## Establish Industrial Connectivity

As a critical first step in building a predictive model, industrial connectivity enables enterprise-wide visibility and data comparison. One way to establish industrial connectivity is through PTC's [ThingWorx Kepware Server](#), which provides secure, standardized data connectivity across disparate equipment (both new and legacy), establishing a foundation on which to scale with IoT<sup>2</sup>.

## Get Actionable Insights from IoT Analytics

PTC's [ThingWorx IoT platform](#) automates analytics and AI so organizations can access actionable IoT insights quickly and easily. These insights are delivered through ThingWorx capabilities including machine learning, which enables your team to predict based on what they learn from IoT data—without involving complex math or data scientists<sup>3</sup>.

<sup>2</sup> <https://www.ptc.com/en/products/thingworx/thingworx-kepware-server>

<sup>3</sup> [ptc.com/en/products/thingworx/iot-analytics](https://www.ptc.com/en/products/thingworx/iot-analytics)

## Predictive Maintenance in Action at Howden

For Howden, a global engineering leader, predictive maintenance helps reduce costly unplanned downtime, optimize performance and energy efficiency, and deliver valuable domain knowledge about machines to its customers.

Howden partnered with PTC and selected the ThingWorx platform for predictive analytics. The partnership powers Howden's Data Driven Advantage (DDA) program, which offers its customers actionable data insights to "avoid costly outages by detecting early warning signs," improving uptime<sup>4</sup>.

[Watch Howden's Full Predictive Maintenance Story >](#)

## Predictive Maintenance in Action at Parata

For Parata Systems, a leading pharmacy automation company, ThingWorx replaced an IoT platform that lacked capabilities in visibility, reporting, and analytics. With goals to improve its customer experience in a scalable way, Parata started with remote condition monitoring and later built a service optimization solution. Now, ThingWorx enables proactive alerts and machine learning for improvements across service efficiency, resource utilization, parts consumption, and service profitability<sup>5</sup>.

[Watch Parata's Full Predictive Maintenance Story >](#)

## Scale Your Predictive Maintenance Strategy

With a dedicated IoT partnership and a predictive model in place, you can focus on expanding your predictive maintenance strategy at scale by:

1. Monitoring the efficacy of your predictive model over time
2. Gathering data and updating your predictive model

<sup>4</sup> [Predictive Analytics Delivering Real Value—a Practitioner's Perspective](#) webcast replay

<sup>5</sup> [Proving the Value of Industrial IoT](#) webcast replay

## Real-World Results of Predictive Maintenance at Scale

The principles of scaling predictive maintenance can be applied in factory and service settings across different industries. A producer of engineered wire and cable for critical aerospace and defense applications identified a production line fault that caused approximately \$400K in scrap, impacting line speed and delivery schedules. Below, learn how their team used predictive maintenance to improve across multiple lines in a factory setting.

### GOAL

To enable prediction of the production issue, empowering operators to adjust line speeds and avoid the issue in the future

### TOOL

A "Gradient Boost" machine learning model from the ThingWorx Analytics suite, which combines multiple models for improved accuracy

### METHOD

- Phase 1: Short-term data collection from a single machine for model setup
- Phase 2: Retrain model with data from five machines
- Phase 3: Expanded data set/time

### TIMEFRAME

Four weeks to initial model setup

### RESULTS

Operators are notified of the risk in the next length of cable, allowing them to slow the line and reduce scrap by 60%

Source: PTC customer results

## Take Control of Your Service Strategy with Predictive Maintenance

Predicting based on your data is not as mysterious as it may seem. With help from a dedicated IoT partner, service organizations like yours can implement a predictive maintenance strategy that addresses enterprise-wide challenges, improves service efficiencies, and reduces downtime. [Explore more resources](#) to start getting actionable insights for valuable predictions.



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