

FAQ

Why you need predictive maintenance.

Factories have been measuring and tracking equipment performance parameters for many years, evaluating everything from production output to equipment effectiveness, and overall productivity. Over the years, modest amounts of automation were added to make the process less time-consuming, error-prone, and inefficient.

Predictive maintenance is what every manufacturer always wanted to do, but never had the tools for the job. But that's all changing and what's taking place today is just the beginning. From the sensors generating the data to artificial intelligence (AI), machine learning, and computerized maintenance management system (CMMS) capabilities, Industry 4.0 will become more than just a pie-in-the-sky concept, but a way to make every manufacturing facility, large or small, a technology showcase.

What's the difference between predictive maintenance and preventative maintenance?

Predictive maintenance is often used interchangeably with preventative maintenance (also referred to as scheduled maintenance), but the two are dramatically different. Predictive maintenance relies on data about the actual condition of equipment in real time (or near so), while preventative maintenance uses a calculated average or expected lifetime and doesn't reflect what is really occurring. That is, preventative maintenance doesn't require the need to gather data from sensors dedicated to specific machines and measuring key parameters: It relies on the experience of people familiar with the equipment and information provided by its manufacturer.

In contrast, predictive maintenance extensively uses data gathered from the equipment itself, continuously over time, and provides a far more precise trend profile based on actual performance. Equally important, it performs this while the equipment is running without the need to take it offline for "a look." In short, instead of guesswork, predictive maintenance provides answers based on measurements, reducing and typically eliminating errors. Not surprisingly, it's predictive maintenance that is playing a key role in the Industrial Internet of Things (IIoT), and its benefits are immense.

Are the benefits of predictive maintenance quantifiable?

The U.S. Department of Energy statistics show that predictive maintenance can deliver a 25 to 30% increase to return on investment through lower maintenance costs, a 70 to 75% decrease in failures, and a 35 to 45% reduction in equipment downtime. “Reactive” maintenance costs four to five times as much, simply because failed equipment reduces overall plant productivity, causes inventory backup, and reduces overall efficiency.

What special capabilities equipment, or systems are required to implement predictive maintenance?

There’s a cost for all the insights that predictive maintenance provides, of course, as it requires several capabilities, including wireless-enabled sensors on equipment to produce data, network capabilities to share it, and increasingly the ability to analyze this data close to where it is generated. This capability is accompanied by AI and a CMMS, which maintains a computer database of information about an organization’s maintenance operations.

To cite an example, a machine senses a drill bit wearing out, orders a new one, alerts the service department to send someone to install it, and forwards the purchase request for the new part to the CMMS. All this information is stored in the CMMS, which then performs a variety of functions including maintaining and organizing regulatory compliance data, tracking completed tasks, compiling labor cost, managing vendors, performing purchasing activity, tracking assets, and producing data needed for budgeting.

AI along with the CMMS promises to take predictive maintenance to the next level, as the system now “knows” not only when maintenance must be undertaken, but who should perform the work. It will also order the required parts, schedule the service, account for the time and cost, keep tracks of parts on hand, and ensure that the job is performed.

What’s all this analysis at the “edge” stuff?

Edge analytics is the collection, processing, and analysis of data at a sensor, network switch or other local device. Performing analysis at the “edge,” has the advantages of reducing latency, as the data doesn’t have to be sent far away for analysis. This means that decisions can be made in near real time—which may be critical in the case of issues that threaten equipment downtime—and security issues are minimized as communication paths are dramatically reduced in size.

How difficult is it to justify the cost of a predictive maintenance program?

Predictive maintenance is what every manufacturer always wanted to do but never had the tools for the job, and what’s taking place today is just the beginning. From the sensors generating the data to AI, machine learning, and CMMS capabilities, the industrial IoT is realizing its full potential to make every manufacturing facility, large or small, a technology showcase. But beyond this, predictive maintenance, possibly more than nearly any other part of the “factory of the future,” delivers big benefits to the bottom line.

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