

Downtime -Technology 3 – Predictive Maintenance

Preventive maintenance (PM) is a proactive approach to maintenance that involves regular, planned inspections, servicing, and upkeep of equipment, machinery, and facilities to prevent potential breakdowns, reduce the risk of failures, and ensure optimal performance. The primary goal of preventive maintenance is to identify and address issues before they can lead to more significant problems or unplanned downtime.

Pros	Cons
<ul style="list-style-type: none"> • Forecasting maintenance costs. • Scheduled maintenance activities. • Reduce unplanned downtime. • Improved plant reliability. 	<ul style="list-style-type: none"> • Network connectivity required for some solutions. • Reliability maintenance approach required to realise value. • Automated solutions difficult to implement.

Technology Cost range: \$50,000 - \$200,000, depending on number of assets in scope, vendor licencing and existing CMMS capabilities.

DMC Technology Cost: \$100,000

DMC Cost Assumptions:

- Limited to 1 Manufacturing process plant mechanical assets to be monitored.
- Existing Process Historian and CMMS.
- Internal costs for end user staff involvement have not been included.
- Single design and build iteration.

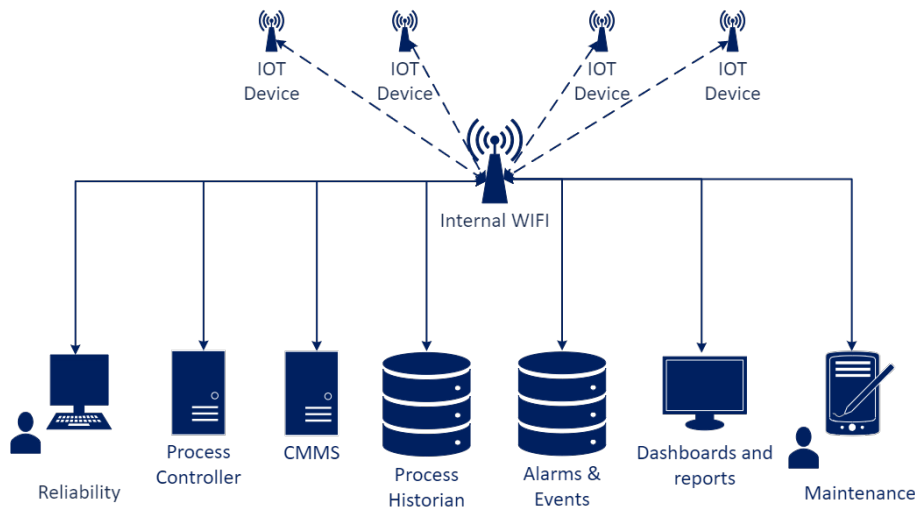
What situation would this technology usually be adopted in? Predictive maintenance technologies are typically adopted in manufacturing environments where maximizing equipment uptime, minimizing unplanned downtime, and reducing maintenance costs are critical priorities. Industries such as heavy machinery manufacturing, automotive, aerospace, and energy production often implement PdM technologies to monitor equipment health, predict potential failures, and schedule maintenance activities proactively.

RoI Considerations: Implementing predictive maintenance technologies can yield significant returns on investment by reducing maintenance costs, avoiding costly equipment failures, extending equipment lifespan, optimizing spare parts inventory, and improving overall operational efficiency. The ability to schedule maintenance activities based on actual equipment condition rather than fixed schedules helps minimize downtime and maximize production output, contributing to increased profitability.

What skills are required to implement & run this tech? Implementing and running predictive maintenance technologies in manufacturing requires expertise in data analytics, machine learning, industrial sensors and IoT devices, maintenance strategies, and domain knowledge of the specific manufacturing processes and equipment. Additionally, proficiency in data collection and analysis, statistical modelling, and software integration is essential for successful implementation and utilization of PdM technologies.

Pre-requisites for successful adoption: Successful adoption of predictive maintenance technologies in manufacturing requires a clear understanding of equipment criticality, identification of key performance indicators (KPIs) for predictive maintenance, selection of appropriate sensors and data collection methods, integration with existing infrastructure, data quality assurance, training for personnel on system operation and interpretation of predictive analytics, and establishment of maintenance workflows based on predictive insights. Additionally, collaboration between maintenance, operations, and data analytics teams is crucial for effective implementation and utilization of predictive maintenance technologies.

Typical Tech Stack



Who can help with this technology? Various entities can assist with the implementation and optimization of predictive maintenance technologies in manufacturing, including predictive maintenance software vendors, industrial automation consultants, system integrators specializing in condition monitoring, and engineering firms with expertise in reliability engineering and data analytics.

What to google when researching this technology? When researching predictive maintenance technologies for manufacturing, key terms to search for include "predictive maintenance software," "condition monitoring systems," "machine learning in predictive maintenance," "asset health monitoring," "fault detection and diagnosis," and "reliability-centered maintenance."