

Intelligent predictive maintenance

Unlocking operational excellence and sustainability



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Introduction:

Not your father's predictive maintenance

Customers using industrial operations' services and buying their products demand high-quality. Unfortunately, aging infrastructure, increasing sustainability demands, and rising maintenance costs are impeding efforts to meet customer needs. Organizations must rethink traditional approaches to succeed.

Central to this transformation is elevating the role of predictive maintenance by taking advantage of developments and innovations in the field. Organizations must leverage abundant data, advanced and predictive analytics, and AI-driven machine learning to dramatically alter the maintenance landscape.

This new era of predictive maintenance brings profound improvements in operational efficiency and cost reduction. To put this into perspective, unplanned downtime costs industrial companies [over \\$50 billion USD annually](#).¹ The consequences of a reactive maintenance strategy—emergency repairs, operational disruptions, and wasted resources—are unsustainable. Organizations that embrace intelligent predictive maintenance solutions can turn these challenges into opportunities for growth and innovation.

Unplanned downtime costs companies more than US\$50 billion annually²

¹ Forbes, *Unplanned Downtime Costs More Than You Think*, 2022

² ibid



Adding intelligence:

The era of next-level predictive maintenance

Traditional predictive maintenance forecasts potential equipment failures based on historical data. While still useful, it lacks the precision and automation needed for today's industrial environments.

By incorporating advanced and predictive analytics, intelligent predictive maintenance takes things to the next level. This approach doesn't just predict when a failure might occur; it prescribes and automates actions to prevent it. The result? Organizations can move from reactive responses to proactive maintenance strategies.

This shift enhances reliability, minimizes downtime, and reduces costs, offering a competitive edge in an increasingly dynamic market.

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Key elements

Intelligent predictive maintenance requires robust technological infrastructure. To derive actionable insights and real-time solutions, an effective predictive maintenance system must meet the following criteria:

- 1 Purpose-built analytics database:** Advanced and predictive analytics require a database designed specifically for high-speed, sophisticated data analysis. This ensures seamless processing of the vast amounts of data generated by industrial systems.
- 2 Data collection and cleaning:** A solution must be able to gather real-time data from various sensors and IoT devices, merging that data with historical maintenance records to provide context for the predictive model. The ability to identify and correct errors or inconsistencies in data is essential.
- 3 Easily accessible insights:** Data visualization and business intelligence (BI) capabilities give organizations the ability to quickly understand what is going on and can help get to the root of many problems. These capabilities provide the level of exploratory data analysis required to understand the data and what is happening.
- 4 High concurrency:** Maintenance operations often involve multiple employees accessing data simultaneously. A high-concurrency database ensures uninterrupted access and analysis, enabling collaborative decision-making.
- 5 Real-time processing:** Industrial environments demand low latency to enable immediate action. Real-time data processing allows organizations to respond promptly to predicted issues, preventing costly delays.
- 6 Advanced query capabilities:** Complex queries need to be executed swiftly and accurately. These capabilities ensure insights are not only timely but also granular enough to inform precise actions.

Together, these elements form the foundation of an intelligent predictive maintenance solution that can meet the demands of modern industrial operations.

Enhanced benefits

The impact of intelligent predictive maintenance extends far beyond operational efficiency. Organizations implementing these solutions realize benefits across multiple dimensions:

- 1 Reduced downtime:** Predictive maintenance can reduce downtime by 30 to 50 percent.² With fewer unexpected disruptions, organizations can operate with greater consistency and reliability.
- 2 Cost savings:** Predictive maintenance can reduce maintenance costs by 18 to 25 percent.³ Companies like Knorr-Bremse and Nimble Storage have reported maintenance cost reductions of 15-25 percent. Automated monitoring and precise failure predictions minimize unnecessary repairs and labor costs.
- 3 Longer equipment lifespan:** Extending asset lifecycles by 20 to 30 percent isn't just a possibility—it's a reality.⁴ By addressing issues proactively, organizations preserve the value of their investments.
- 4 Resource optimization:** Automated systems reduce labor and inspection costs by 15 to 20 percent.⁵ Implementation of predictive analytics exemplifies how intelligent solutions streamline resource allocation.
- 5 Higher reliability:** Uptime and reliability improvements of up to 30 percent significantly boost customer satisfaction and operational efficiency. These gains also align with sustainability goals by reducing waste and energy consumption.

¹ Nucleus Research, [Quantifying the value of predictive maintenance](#), 2023

² U.S. Department of Energy, [Operations and Maintenance Best Practices Guide Release 3.0](#), 2020 ^{2*}

³ The Agility Effect, [How predictive maintenance cuts costs](#)

⁴ Faster Capital, [Useful Life: Extending Useful Life: Getting the Most Out of Your Fixed Assets](#), 2024

⁵ Medium, [AI in Manufacturing: Enhancing Efficiency and Innovation](#), 2024

**Intelligent maintenance can
reduce downtime by 30-50%.²**



Sustainability:

A crucial consideration

Intelligent predictive maintenance doesn't just optimize operations—it supports sustainability goals. By reducing resource wastage, minimizing energy consumption, and extending equipment lifespans, these solutions contribute to a greener future. Companies can achieve regulatory compliance while enhancing their reputations as environmentally responsible organizations.

Moreover, sustainability initiatives often overlap with cost-saving objectives. For example, reducing unnecessary repairs not only cuts expenses but also decreases material waste. By aligning business objectives with environmental priorities, organizations position themselves as leaders in a global movement toward sustainability.

In addition to sustainability, intelligent maintenance delivers a 10X return on investment.¹

¹ Gartner, *Top 10 Strategic Technology Trends*, 2023

A case for investment

As the industrial sector becomes increasingly data-driven, the question isn't whether to adopt intelligent predictive maintenance—it's how quickly it can be implemented. Solutions like OpenText™ Analytics Cloud exemplify the power of advanced tools tailored to meet the demands of modern operations.

Organizations investing in intelligent predictive maintenance today are laying the groundwork for long-term success. By harnessing the power of advanced analytics and AI, they're reducing downtime, cutting costs, optimizing resources, and achieving sustainability goals. The return on investment is clear: improved reliability, customer satisfaction, and competitive advantage.

Future growth

The predictive and intelligent maintenance market is expected to reach \$23.5 billion by 2025.¹

¹ MarketsandMarkets, *Predictive Maintenance Market Growth and Trends*, 2020





Conclusion:

The future of maintenance

Industrial operations are entering a new era. Intelligent predictive maintenance is more than a trend—it's a necessity for organizations looking to thrive in a rapidly evolving landscape. By leveraging advanced technologies and embracing a proactive approach, businesses can unlock unparalleled efficiency, cost savings, and sustainability.

The journey toward intelligent predictive maintenance may require investment in new technologies and processes, but the rewards far outweigh the costs. For decision-makers seeking to future-proof their operations, the path forward is clear. Intelligent predictive maintenance isn't just about maintaining equipment—it's about driving excellence and innovation across the entire organization.

[Learn more about solutions driving intelligent predictive maintenance](#)

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