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POINT OF VIEW

Accelerating predictive maintenance in energy and resources

Transform asset reliability and safety through AI and IoT-powered maintenance strategies

"The losses from downtime for an average large plant are now $253 million a year."[1]

Industry backdrop

With the global demand for energy and many essential resources set to grow to record levels[2] in the coming years; utilities, oil and gas, chemicals, and metals and mining companies face unprecedented pressure to achieve production targets and maximize asset reliability while minimizing operational costs.

Record levels of capital investments[3] into new and existing facilities, combined with the aging of existing infrastructure is causing the ratio of fixed assets (aka, machines) to significantly outpace the number of employees that operate and maintain them (aka, man). Companies across the entire energy and resources sector will have to continually make advancements in their maintenance strategies toward a predictive methodology to maximize the productivity of both man and machine. The financial incentive to do so is substantial. According to Deloitte, predictive maintenance can increase equipment uptime and availability by 10 to 20 percent and reduce overall maintenance costs by five to 10 percent.[4]

Several additional key trends will drive the adoption of predictive maintenance in the energy and resources sector:

- Rising operational costs and pressure to improve efficiency.
- Increasing complexity of industrial equipment and systems requiring more sophisticated maintenance approaches.
- Regulatory pressure to improve safety and environmental performance through better asset management and external forces to continuously evolve safety practices and incorporate technologies to reduce the number of incidents and corresponding loss values.
- Growing skills gap as experienced workforce retires, taking valuable maintenance expertise with them.
- Expanding deployment of industrial IoT sensors, with the industrial IoT market expected to reach $137 billion by 2030.[5]

This paper explores how information management technologies and best practices in the areas of advanced analytics, B2B integration, industrial IoT, and other information management areas will help companies across this sector keep critical assets running safely with predictive maintenance.

1 Siemens, *The True Cost of Downtime 2024*, 2024
2 IEA, *World Energy Outlook 2024*, 2024
3 McKinsey & Co, *Global Energy Perspective 2023*, 2024
4 Deloitte, *Predictive Maintenance and the smart factory*, 2022
5 IndustryARC, *Industrial IoT Market Size, Share | Industry Trend & Forecast 2030*

"I see two levels at which predictive maintenance specialization and scalability will occur into the future; at the equipment level and at the facility or industrial asset level."

Phil Schwarz
OpenText Sr. Industry Strategist – Energy & Resources

The OpenText vision for predictive maintenance in energy and resources

Predictive maintenance is being performed on the world's most critical, costly, and technologically advanced equipment, such as gas turbines, transformers, and compressors. It's also being used at the industrial asset level by asset owners who are technology leaders and are at the forefront of innovation. So, the question that remains is, what's next for predictive maintenance across the energy and resources sector? The likely answer is specialization and scale.

Predictive maintenance will be scaled across utilities, oil and gas, chemical, and metals and mining industries at the equipment level and the facility or industrial asset level. Predictive maintenance at the equipment level will expand beyond the most critical and costly equipment to moderately complex equipment types, such as automation and control equipment, pressure containing equipment, motors, and much more. Predictive maintenance at this level will likely be led by equipment manufacturers and strategic service providers because of their equipment expertise and vast install bases and services across the world. The most robust predictive models will leverage the equipment sensor data from these vast install bases and the knowledge from equipment design engineers around potential failure modes, their causes, and the associated sensor signatures. Moreover, manufacturers and service providers want to move beyond selling transactional product units and field services. They're seeking ways to deliver business outcomes that extend beyond product and service quality to business outcomes that directly contribute to their customers' KPIs at the industrial asset level, such as asset uptime and safety.

It's likely industrial asset operators will lead predictive maintenance specialization at the industrial asset level because every industrial asset, its lifecycle, and operating model is unique. Predictive maintenance at this level will expand beyond the technology leaders to companies that have business models driven by operational excellence. These companies require predictive maintenance tools that can be scaled across unique facilities with unique asset lifecycles, business units, and across the entire enterprise to cost effectively, safely, and reliably reduce unplanned downtime and outages.

There are several information management requirements to support scalable predictive maintenance processes at the equipment and industrial asset levels:

Secure B2B integration that streamlines equipment sensor data exchange

Secure B2B integration of equipment sensor data enables seamless collaboration between industrial asset operators and their strategic vendors for predictive maintenance while protecting sensitive operational data. To achieve this, a unified platform that connects people, systems, and things is required to securely exchange sensor data across organizational boundaries to enable predictive maintenance specialization at the equipment level.

Using IoT, the collection of sensor data from equipment is orchestrated (in real time, near real time, or other predictive time window based on the level of risk), encrypted, and transmitted through secure B2B connections, allowing equipment manufacturers and service providers to monitor their installed base remotely, analyze performance patterns, proactively identify potential failures, and collaborate with industrial asset operators to optimize equipment reliability, reduce downtime, and mitigate safety risks. Likewise, the output of predictive models at the equipment level can be used as inputs at the industrial asset level.

Establishing this secure digital backbone to integrate people, systems, and things is also used to facilitate the procurement of spare parts, replacement equipment, and field services from strategic vendors. This also ensures they can be tracked all the way through to the point of delivery to avoid asset downtime and safety incidents.

Advanced AI/ML to predict the likelihood of failure

An AI/ML platform can analyze the data at the equipment level or industrial asset level to assess the likelihood of a failure. At the equipment level, AI can examine historical operational information about the piece of equipment to see whether any similar equipment has failed in the past. Combining this information with field service data, field service schedules, and failure rates of equipment components, AI can make a prediction of whether a component will fail or whether it can be repaired.

Similarly at the industrial asset level, each piece of equipment is essentially a component of the broader industrial asset. AI can examine historical operational information facility wide to analyze the interconnected system and predict when equipment failures are likely to occur. Combining this information with operational data, maintenance schedules, and failure rates of equipment, AI can make a prediction of whether an asset will fail so that action can be taken accordingly.

Intelligent assistant to quickly access knowledge for safe execution

An intelligent digital assistant can significantly enhance predictive maintenance operations by providing rapid access to critical knowledge and documentation. When facility operations and maintenance teams or field service teams encounter equipment issues or need to follow specific procedures, they can interact naturally with an AI assistant to quickly retrieve relevant engineering drawings, technical manuals, safety protocols, maintenance histories, step-by-step guides, troubleshooting instructions, and other critical information. Time spent searching, accessing, retrieving, and finding information within a document can be replaced by simply asking the intelligent assistant the question at hand. Technicians receive a trusted response with quick links to the documents that contain the answer for validation purposes.

Role-based, secure access to enterprise information

Maintaining equipment or assets in the field may require third-party contractors for conducting repairs or service activities. To help with efficient repair, technicians will need secure access to information. Identity and access management can be used to assign a digital identity to internal and external users to ensure they have access to the necessary information and applications.

Why OpenText?

OpenText powers and protects information to give organizations the information advantage. We sit at the center of connected ecosystems and the internet of clouds, and play a critical role as our customers adopt cloud, security, and AI. We serve thousands of companies across the world in the energy and resources sector, including 24 of the top 25 by market cap in their journey to safely, reliably, and cost effectively deliver critical commodities to the world.

"Predictive maintenance can increase equipment uptime and availability by 10-20% and reduce overall maintenance costs 5-10%.[6]

The world is in a race for energy and essential commodities, and that race is just as much about information management as it is about energy and critical resources. We help organizations with the most complex information challenges to reimagine information and elevate human potential. Our solutions connect knowledge with action to spur innovation and growth across the energy and resources sector along with many others.

Proposed next steps

We welcome the opportunity to be your strategic partner in your predictive maintenance journey. Together, we can outline a vision and identify opportunities to accelerate predictive maintenance for operational excellence. Below are suggested next steps to ensure your predictive maintenance journey is in lockstep with your information management journey.

- **Introductory meeting**
  Bring together the OpenText Global Account Director or Senior Account Representative with your organization's Business Unit President, COO, CTO, or decision maker on IT infrastructure investments.

- **Joint roadmap exchange**
  Hold a day-long information exchange with operations leaders (Directors and above) and OpenText. OpenText will gather insight regarding your maintenance or field service processes and associated digital transformation initiatives, current approaches, and obstacles. OpenText will then provide an overview of information management technologies and best practices that support those initiatives.

- **Business Value Consulting workshops**
  Engage OpenText Business Value Consulting with supporting lines of business to assess their current state and quantify the business impact of potential OpenText solutions along your end-to-end predictive maintenance process.

Contact

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6 Deloitte, *Predictive Maintenance and the smart factory,* 2022