



Proactive and Preventative: Scalable Analytics for Predictive Maintenance

Data Generation Is Not The Problem

The opportunity for scalable advanced analytics in predictive maintenance.



The ability to manage a variety of asset types and avoid unplanned downtime is no trivial task. An entire operation can come to a halt if just one critical process, asset, or machine fails. But too often **organizations are forced to rely on outdated, incomplete, or inaccurate data to make decisions resulting in inefficient operations.**



The #1 driver for investments in predictive maintenance among service leaders is the need to **have a faster response to product quality and service issues.**



As more products and equipment are connected providing a wealth of data points, **data availability is no longer the primary problem impacting organizations' ability to improve maintenance, service, and support.**

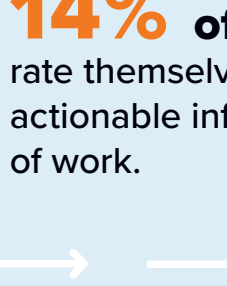


Siloed processes and data, lack of a scalable, high-performance data analysis platform, and analytic methods focused only on past performance hinder the **ability to shift from reactive maintenance to more proactive, predictive, and prescriptive models.**

Source: IDC Manufacturing Insights Product and Service Innovation Survey, 2021

Shortcomings of Break/Fix and Reactive Service Models

Unplanned downtime is more than just a nuisance to facilities, plant, and field service operators



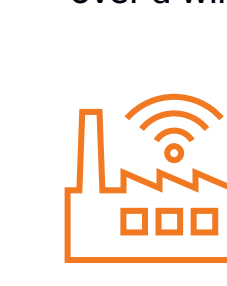
28% of manufacturers still characterize their service, operational, and maintenance approach as break/fix and reactive.



30% of manufacturers find it very difficult to address challenges resulting from a lack of process automation, inefficiencies in workflow (e.g., manual, duplicative, siloed work), and delays in transforming data from information to knowledge.



The lack of insight, based on data, to predict failures and to plan for downtimes and outages **can cost an enterprise millions of dollars and negatively impact customer experience.**



Only **14%** of manufacturers rate themselves as excellent at surfacing actionable information to all users in the flow of work.

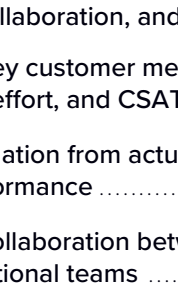
Sources: IDC's Future of Intelligence Survey, 2021 and IDC Manufacturing Insights Product and Service Innovation Survey, 2021

The Promise of Predictive Maintenance

Turn smarter equipment, assets, and products into better outcomes

The Right Outcomes Need Relevant and Timely Insights

Q. What percentage of products your organization currently manufacturers are considered "connected" (i.e., have a unique IP address and software within them to enable service and product performance information to be communicated over a wireless network)? What will that be in three years?



44% Today **60%** 3 years from now

Improve service and maintenance through data-driven, near-real-time insights

31% of manufacturers are seeing a shift to:



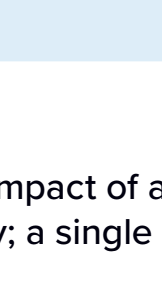
More predictive and preventative service

20% of manufacturers are seeing a shift to:



More prescriptive service and maintenance

The future of maintenance is:



The ability to predict a failure and just as importantly trigger the appropriate response while allocating the right skills, parts, and tools to ensure preventative resolution

The Right Outcomes Need Relevant and Timely Insights

Q. What are the top five drivers for your organization's service life-cycle management efforts?

(% of responses)



Source: IDC Manufacturing Insights Product and Service Innovation Survey, 2021

A Modern, Scalable, Data Analytics Platform

Support for data exploration and decision automation

Decision Making, Data, and Analytics Usage Patterns

Data exploration and investigation

Key driver identification

Guided root-cause analysis

Decision Automation

Conditional decision automation

Algorithmic decision automation

Data exploration and investigation is about helping users understand and explain what happened and why it happened.

Decision automation is about automating tactical decision making in the flow of operations.

Consider the following predictive maintenance decision variables:



Scope:

The breadth of the impact of a given decision. Does it impact a single asset or many; a single activity or one whole process or multiple processes?



Latency:

The time window or time interval within which a decision needs to be made or an issue needs to be resolved.



Variability:

The extent an issue is pre-defined vs. ad-hoc. Is this a regularly or consistently reoccurring decision or one that needs to be made rarely?



Ambiguity:

The extent to which the issue at hand is open ended. How open to interpretation is data needed to make the decision?

Risk:

The monetary value at risk of the decision.

Requirements of a modern data analytics platform for predictive maintenance



Minimization of data movement



Pre-built support for commonly used analytics, including support for AI/ML algorithms



Ability to extend analytic capabilities with customized and unique algorithms using data scientists' preferred languages and tools



Availability of cloud storage APIs



Support for, and integration between relational data warehousing and data lakes, including those based on open-source software



Support for standard development languages and skills (e.g., SQL, Java, C++, Python, R)



Support for real-time service level agreements



Separation of compute and storage to enable flexibility in matching technology resources and costs to variability in analytic workloads



Support for Big Data processing requirements, including terabytes per second ingest/egest rate, and exabyte storage capacity.

Source: IDC, 2022

What steps should organizations take to solve the problem or seize the opportunity?

Insights at Scale

Complexity of Maintenance Operations Doesn't Require a Complex Response



Develop a long-term data and analytics strategy that considers various decision-making patterns and batch data and analytics IT requirements – both for streaming and batch data processing and analysis at scale.

Assess data quality and availability guaranteeing data-driven decisions can be made.

Consider IT partners that provide a modern data, analytics and AI platform that is extensible and leverages a broad partner ecosystem as no single vendor can do it all.

Don't expect a single technology to address all requirements. SQL-based, columnar, MPP analytic databases have a role, so do data lakes and streaming data processing software, and a range of upstream and downstream data integration and data analysis and visualization tools.

Select appropriate data and analytics technology that is not just about finding solutions with the most compute power or storage capacity (and flexibility); also consider security, support from solution provider, and overall total cost of ownership.

Source: IDC, 2022

Message from the Sponsor

Vertica is the analytical database that delivers the best value for the highest performance. Any data analytics. At any scale. Anywhere. Built to handle the most demanding use cases, Vertica is an infrastructure-agnostic, software-only solution that can be deployed on-premises, containerized, or in any private/public/hybrid cloud.

Learn more about using Vertica as part of a modern, scalable, data analytics platform for predictive maintenance

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