Market Guide for Asset Performance Management Software

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Initiatives: Manufacturing IT Optimization and Modernization and 1 more

APM is a system of innovation that adds capability for effective and efficient asset maintenance decision support, but market immaturity complicates the path forward. CIOs can use this guide for insights on APM offerings to make the best technology decisions to support asset management activities.

Overview

Key Findings

- Asset performance management (APM) is not a mature technology and its significance differs across industries. Organizations are looking beyond current software features and are defining APM priorities based on their unique business capabilities.

- Organizations realize the need for a combination of asset maintenance strategies suited to a variety of asset types and situations across the business through a toolbox approach. However, vendor products are not created equal and may require organizations to choose more than one APM product, create more customized functionality or accept fewer capabilities.

- As operations take advantage of newer sensors (e.g., acoustic), drones and bots, APM has access to increased data volumes of better quality and granularity (or reduced latency) and accuracy yield richer use cases and more robust capabilities.

- Integration with enterprise asset management (EAM) is important for the ability to efficiently and effectively execute APM recommendations. However, continued advancement of APM capabilities within EAM products increases software product overlap.

Recommendations

CIOs in asset-intensive industries looking to drive technology optimization and modernization for better asset performance must:

- Assess the organization’s asset management capabilities by working with business and IT leads to ensure the requisite level of people/skills, processes and systems data are in place before investing in APM.
Map the requisite maintenance strategies needed to achieve specific business outcomes for the types of assets within your enterprise. Work with IT departments and business users to determine a viable roadmap to expand the available systems from where they are now to a full multilevel capability.

Evaluate potential vendor products by completing fit-gap analysis focusing on business capability mapping compared to application functionality. This will create a more complete repertoire of maintenance capabilities for the different assets across your organization, providing a broad array of skills and tools. Consider the product or portfolio of products that most completely meet your capability requisites and fit well into your ideal application architecture.

Ensure APM insights can be acted on by evaluating the footprint and maturity of your EAM system, and have a sustainable integration plan with APM before investing in APM. This will ensure a solid foundation for progressing your asset management strategies.

Strategic Planning Assumptions

By YE23, 40% of asset-intensive organizations will have more than one product deployed with advanced APM capabilities.

By YE22, only 35% of asset-intensive organizations will have asset maintenance activities across their asset base, beyond condition-based maintenance (CbM).

Market Definition

The asset performance management (APM) software market is defined by buyers looking for software tools and applications to optimize the reliability and availability of operational assets (such as industrial plants, equipment and infrastructure) essential to the operation of an enterprise. Organizations invest in APM tools and technologies to reduce unplanned repair work, improve asset availability and safety, minimize maintenance costs, and reduce the risk of failure for critical assets. APM uses data, integration, analytics and visualization to improve operations and maintenance scheduling, and to identify which maintenance and inspection activities to perform on industrial assets. APM products provide capabilities and functionality to support risk management, predictive maintenance, reliability-centered maintenance and financially optimized maintenance activities.

Market Description

Asset performance management (APM), is not a new technology, nor is it a mature software market. Most organizations practice only lower levels of maintenance capabilities (see Figure 2) such as preventive maintenance and condition-based maintenance (which has more recently become an intrinsic part of EAM products). Additionally, vendor products are immature with capability and technology limitations. Often, asset-intensive organizations are slow to advance to
higher levels of maintenance maturity due to challenges in proving the investment business case, capturing ROI, and developing the foundational data sources, processes and tools that support the more advanced capabilities. APM market maturity has historically lagged others such as EAM, due to several factors:

- Organizations have limited availability of good-quality and consistent asset data to support a more advanced maintenance strategy.
- There is limited alignment of asset management standardization such as ISO 55000.
- Digital business immaturity constrains organizational ability to support advanced asset maintenance capabilities.
- There is limited technology availability and proven product capabilities.
- ROI is often challenging to demonstrate when current- versus future-state capability and results cannot be easily compared.

Vendors of EAM Products Build Out APM Capabilities

More recently, EAM product vendors have begun building out more advanced asset maintenance decision support capabilities in their EAM products. EAM systems have advanced to provide condition-based maintenance (CbM) as an intrinsic part of EAM. Further functional development from EAM vendors provides their clients with more robust capabilities embedded in the EAM products. These advancements have expanded the market of vendors that can support a CbM strategy. Due to this market expansion, we have adjusted Figure 2 below to only include the top three levels of maintenance strategy explicitly supported in APM products, as the majority of EAM products now have a reasonable CbM capability (see Magic Quadrant for Enterprise Asset Management Software).

APM Significance Differs Across Industries

Although asset maintenance strategies are advancing and APM adoption is progressing, it comes at a varied pace across industries. Those industries that depend more exclusively on their assets — such as transportation, utilities and natural resources — tend to be further along in their asset management activities and typically invest more heavily in APM tools. Other industries that rely on physical assets to some degree — such as healthcare, retail and public sector — are less mature in this journey, and may not invest as heavily in APM solutions (see Figure 1).

Figure 1: APM Significance by Industry
Asset management significance is different across industries. If a critical asset fails in an asset-centric organization represented on the right side of Figure 1, it likely has greater impacts to the bottom line of the business compared to those on the left side of Figure 1. For example, in a utility organization, if critical assets are not properly maintained (such as a substation or transformer) the resulting implications could be catastrophic such as the cause of wildfires, loss of property, loss of life, power outages, loss of production capabilities or limited or no access to essential service of clean water. In a service-centric organization, if a critical asset fails, it may not be a first-line service or service may be diverted to another part of the business, delayed or outsourced.

For example, in a hospital, an x-ray machine may provide an essential service. If it’s not properly maintained, it may have safety hazards or cause inconvenience to customers and patients, patients may be diverted to a different floor in the hospital with a working machine or to a local healthcare provider office, or the appointment may be delayed. Further, a utility may provide mission-critical power for the hospital, but the hospital may also install a backup power source. In this case, the hospital critical asset for power is a backup if the servicing utility service fails. Essentially, in asset-intensive industries, APM provides capabilities in support of requisite, bottom-line business-critical operations. In these industries, APM is a “must have” tool, while in other industries, it is a “should have” or “nice to have” tool in support of business operations.
It is also important to note that not all organizations are mature enough to invest in APM. In some instances, there may be immature asset management processes, significant data gaps and inconsistencies, or no standard EAM system of record. In these situations, the better investment may be to upgrade or consolidate the existing EAM system footprint and/or invest in data cleansing. APM is not an execution system and, therefore, depends on EAM to execute its recommendations and provide feedback on the results (see Figure 2). APM system implementation success also depends on data quality. Therefore, bad data will result in bad data out. Before investing in APM products or capabilities, organizations should focus on EAM for the foundation and basic needs in asset management, as it is the center of asset activities. As organizations progress their asset management strategy, they should assess the maturity of their EAM system and have a sustainable integration plan between the two systems (EAM and APM) in addition to a data quality assessment (see Mapping a Route to Asset Management and Reliability and Financially Optimized Maintenance Planning Using Asset Performance Management).

**Figure 2: Maintenance and Reliability Flows**

**Maintenance and Reliability Flows**

APM includes specific functional capabilities (organized by APM category) that require data collection and aggregation from data historians and other operational data stores for the purpose of analysis (see Table 1).
<table>
<thead>
<tr>
<th>Capability</th>
<th>Processes and Tools</th>
</tr>
</thead>
</table>
| Asset Risk Management            | ■ Various analysis techniques and tools for calculating risk and assessing criticality, including:  
  ■ Weibull analysis — Statistical distribution of asset life data from a representative set of sample units to predict the life of an asset  
  ■ Risk-based inspection (RBI) — Analysis methodology and process that requires qualitative or quantitative assessment of the probability of failure (PoF) and the consequence of failure (CoF) associated with each equipment item  
  ■ Fault tree analysis (FTA) — A deductive failure analysis method that models the pathways within a system that can lead to failures or undesired results |
| Asset Strategy Management        | ■ Data collection and aggregation from EAM systems  
  ■ Integration with major EAM systems for updating and executing maintenance plans  
  ■ Mechanical integrity — Management of critical process equipment to ensure it is designed and installed correctly, and that it operates and is maintained properly (that is, all elements are fit for service)  
  ■ Safety integrity level (SIL) analysis — A method to indicate the tolerable failure rate of a particular safety function |
| Reliability-Centered Maintenance (RCM) | ■ Data collection and aggregation from EAM systems  
  ■ Root cause failure analysis — Actions taken to determine why a particular failure or issue exists and correct those causes  
  ■ Library of failure modes and recommended practices  
  ■ Failure mode and effects analysis (FMEA) — A method to identify where and how an asset might fail and to assess the relative impact of different failures |
Market Direction

Business processes supported by APM software are becoming an important core business capability for asset-intensive organizations. CIOs are increasingly realizing benefits which aid the market transition beyond the use of APM focused on equipment reliability to increasingly leveraging APM to also help improve overall business operations.

This progress is fueling activity in the software market in three key areas:

- **Vendor activity:** Activity includes M&As, partnerships, new entrants, and expansion of product capabilities and specialized products targeting a specific industry or subsectors, class of assets or asset maintenance strategy.

- **Increasing acceptance and alignment with asset management standard ISO 55000:** Organizations accept and adopt ISO 55000 maintenance standards, and vendors increasingly build in capacity in their product alignment and support for clients.

- **Market confusion:** Conflicting vendor claims overlap with complementary products such as with industrial Internet of Things (IIoT) platforms that can support predictive analysis, the growing number of EAM systems that can now also provide CbM and beyond, APM included as a part of digital twins and, OEMs including predictive analysis support.

Single-site product deployments still dominate, generally with a continued increase in enterprisewide APM deployment initiatives among CIOs. This trend is being driven by asset-intensive organizations seeking to break down business silos and regional barriers, reduce licensing carrying costs, and aid system optimization.
Asset-intensive organizations have developed their maintenance and operations processes based on legacy technology capabilities. As organizations advance their asset management capabilities and activities supported by technology investment, they evaluate the need for operations process redesign to gain work efficiencies. Modern APM software products (integrated with other systems) provide better and streamlined capabilities, which is of increasing interest to organizations to better capitalize on capabilities through better use of technology.

Overlap With Complementary Systems Drives Market Confusion

Advancements of technologies such as machine learning, artificial intelligence (AI) and analytics fuel the growth and expansion of complementary products, creating market confusion. The confusion comes from complementary systems such as:

- **Industrial IoT platforms, which can support predictive analysis on equipment data.** Although industrial IoT platforms can support predictive analysis, these are often more generic “equipment data analysis” tools that are not specific — or proven — in the realm of machine reliability forecasting (see Magic Quadrant for Industrial IoT Platforms).

- **APM being offered as a data source into digital twins.** Digital twins are conceptual rather than a “product.” Vendors that promote a digital twin offering for industrial equipment will usually include some predictive maintenance capability. This is often through an embedded third-party APM product, which is a data source integrated with a DT. Some vendors have a native APM offering in addition to a DT offering. However, the often-flexible definitions of digital twin being used by vendors mean that there is no consistency in what is available (see Why and How to Design Digital Twins).

- **OEMs increasingly offering equipment as a service (EaaS) or at least a predictive maintenance service offering.** They themselves will use an APM product at the back end, but this may not be transparent or accessible to the end-user organization. This creates the potential for multiple “no code” predictive deployments, but also the hazard of data “black holes.” (See Guide Contract Management With the EaaS Customer Bill of Rights.)

Organizations Leverage a Toolbox Approach to Asset Maintenance

There are many valid strategies available for improving reliability and managing maintenance — all delivered by APM products. (See Figure 2.) These should not be thought of as “good” and “bad,” but rather as different approaches to the same overall issue, targeting different circumstances. The objective of APM within an asset management strategy roadmap is to have a broad array of maintenance capabilities, skills, and tools and then to match the needs of different asset classes to those tools in a toolbox approach. Just as a maintenance worker would not use a hammer for every job and would have an array of tools available for any given job, an organization will need to leverage many different skills and tools for asset maintenance. Most APM vendors do not offer all levels of APM maintenance strategies. Therefore, organizations may need more than one APM
product, depending on the complexity of their businesses, the types of assets and their asset maintenance goals.

Although enterprisewide deployments increase, organizations remain in line with a toolbox approach to asset management as they increasingly deploy more than one product with APM capabilities, mapping asset maintenance activity to the asset class and criticality in the organization. Therefore, an organization may have one product deployed enterprisewide for a specific maintenance activity on a specific class of assets and another for a different class of assets. For example, in an oil and gas organization, they may have one product deployed enterprisewide to support a predictive maintenance activity on a fleet of compressors and a different product deployed supporting predictive maintenance for a class of valves and another product deployed to support CbM on a class of pumps.

Cloud-Based Deployments Increase, but the Dominant Delivery Method for APM Continues to Be On-Premises Systems

Changing user attitudes and expanding vendor offerings are creating new market dynamics. Although on-premises deployments still dominate the market, most vendors offer cloud-based APM solutions and have APM-as-a-service offerings. Furthermore, some APM vendors are pursuing a cloud-first strategy, so cloud-based APM in these cases will include more up-to-date enhancements than the on-premises versions. The expanded set of cloud-based APM options is attracting some buyers — mainly smaller organizations. However, it is becoming increasingly rare for organizations that are in the market to buy, upgrade or replace an APM system to not investigate the possibility of a cloud deployment. This openness to discussing cloud as an option is a leading indicator for future cloud adoption.

It is important to note that the benefits and changing attitudes vary among industries, and the style, architecture and security of cloud requirements will vary due to compliance, regulations and other requirements. Clients should not feel compelled to move to cloud for fear of being “out of step” with the market.

Cloud considerations for asset-intensive or asset-centric organizations should include:

- Make cloud an option if considering a new APM project, but be aware of the relative immaturity of the market. Run pilots and evaluate reference cases that show the maturity of the solution and its applicability to your own situation.

- If considering an APM system upgrade, evaluate whether cloud might be a viable — and possibly even the best — deployment option. For that, do not just compare the financial benefits, but also compare the risks that come from being a relatively early adopter.

- If you have complex APM requirements, don't rush into cloud.

- If you have complex requirements, but are committed to pursuing a cloud strategy, then plan on a single-instance, hosted approach to cloud.


If cloud deployment of APM is your first choice, be prepared to switch vendors. Your current vendor may not have a viable cloud option or, indeed, may be moving to cloud only. Compare the roadmaps of your alternative vendors for the next two application and feature updates with what your current provider offers to more fully plan for the future.

System Integration Contributes to More Efficient Work Practices

Mobile Field Workforce Products

Mobile field workforce product integration continues to be an important component in advancing asset management strategies and optimizing fieldwork. This is increasingly driven by organizations seeking to better align work and asset management and optimize the pool of available resources. Additionally, complementary to the data collected through the Internet of Things (IoT), mobile technologies are employed for the capture and viewing of inspection data in the field in the form of operating statistics and condition data. This is a crucial building block for RCM analysis. The integration with mobile solutions allows the capture and use of real-time data in the field.

In addition, most organizations need good mobile capabilities with APM and other complementary technology for offline use. To meet asset management and field operations needs, some organizations are seeking an industry-specific solution such as mobile workforce management (see Market Guide for Mobile Workforce Management Systems for Utilities). Others opt for a more horizontal mobile solution such as field service management systems (see Utility Mobile Workforce Management and Horizontal Field Service Management Systems Provide Different Capabilities to Utilities). These products aid in the optimization of field work across the organization, which includes asset inspection and maintenance.

Geospatial Capabilities

Geospatial capabilities improve data collection and work efficiency in the field. These capabilities equip field workers with access to up-to-date mapping data and data to help them understand what is happening with an asset — as it relates to the associated location and context — and why it is happening. For example, in a gas line leak, a technician can more easily find a specific component like a shut-off valve and view other layers of infrastructure like underground cables or sewer lines that may obstruct access to the gas line.

A GIS is designed to represent assets, customers and surrounding elements, based on spatial positioning. It can also support real-time modeling, visualize network topology (such as in utilities for electrical, gas and/or water), and depict the relationship between assets and the environment. GIS is foundationally a spatial information system. GIS is embedded for a graphical interface, which assists with better planning and routing. Some uses include field mapping and design for asset inspection, maintenance and procurement, and decision making in the field. Other capabilities (such as geofencing, dynamic rerouting and lightweight apps for geocentric data reporting processes) can present organizations with more options and flexibility. Location-aware
and context-aware applications are essential for long-term productivity improvement. This is not to be confused with GPS-enabled apps on smartphones. GPS provides capabilities such as dynamic rerouting using sourced map tiles (such as Bing, Google or Here). GIS provides capabilities such as viewing layers of infrastructure where the data must be sourced from less “public” sources.

**Asset Investment Planning Solutions**

Asset investment planning (AIP) solutions aid asset decisions related to repairing or replacing assets. Many organizations are seeing more complex revenue streams and are increasingly under pressure to do more with less, forcing them to rethink asset utilization and life span. AIP systems take data from EAM and APM systems — primarily on asset conditions, maintenance costs, criticality budgets and risks — and analyze the data to determine spending alternatives. AIP helps organizations make objective, data-driven decisions to optimize cost and minimize operational risk over the full investment life cycle of an asset: construction, predicting asset conditions, funding for repair, reallocation or replacement. (See Optimize Utility Capital Expenditures With Asset Investment Planning Solutions and Best Practices for Choosing an Asset Management System Integrator.)

**Market Analysis**

There are two other complementary, but separate, asset management systems — enterprise asset management and asset investment planning. These are not assessed in this research, but it is important to understand the relationship (see Figure 3 for the relationship flow):

- APM should have integration with the EAM system for triggering work orders in all levels of functional capabilities listed above in Table 1, and most EAM vendors have invested in some level of APM. An important shift to note is that condition-based maintenance (CbM) capability, which was historically viewed as part of APM, has recently evolved to be an intrinsic part of EAM products. Some EAM vendors have an APM product strategy; many rely on partnerships with APM vendors. Sourcing an APM solution that is compatible with your EAM solution provides more ready-to-use integration. See Magic Quadrant for Enterprise Asset Management Software and Survey Analysis: EAM Functional Satisfaction in 2020.

- APM integration with AIP is common for including data on asset condition, maintenance costs, criticality, budgets and risks, which then is analyzed to produce capital investment plans over extended time. This integration and solution set is increasingly deployed most heavily by local governments, utilities, oil and gas, transportation, facilities, and telecom, and is of interest to manufacturing and healthcare industries (see Optimize Utility Capital Expenditures With Asset Investment Planning Solutions). APM is a decision support tool designed to support safe, reliable and efficient operation of equipment and infrastructure.

![Figure 3: Data Flow in Asset Management Systems](image-url)
Gartner surveyed APM vendors to assess their proportional coverage of global markets. The vendors shown in Figure 4 supplied the percentages (with the overall total for each vendor equal to 100%) of 2019 APM revenue by geographic regions and customer counts.

Figure 4: Vendor APM Revenue by Geography and Customers
The APM market is composed of two distinct, but overlapping, submarkets. One is a market of APM platform vendors. The other is a market of asset analysis solutions used to support specific analytical approaches or, in some instances, specific classes of assets.

**APM Platform Products**

Platform vendors deliver comprehensive APM platforms for:

- Aggregating asset data
- Analyzing the data
- Creating an asset management strategy based on risk factors, criticality and predicted outcomes
APM platform vendors support a comprehensive range of risk assessment and management methodologies (as described in the Market Definition section). They also provide integration with EAM systems and operational data stores, such as data historians. If deployed as an enterprise system, an APM platform becomes the focal point for an organization's asset management strategy and, where applicable, its adherence to the ISO 55000 standard for physical asset management.

An organization should not automatically select a platform vendor because it has a comprehensive platform. These offerings should be considered only if — based on the needs of your organization — you are in the market for an integrated product set.

**Asset Analysis Products**

Asset analysis vendors typically provide a subset of capabilities that support asset maintenance that includes:

- Aggregation of data from various operational data sources
- Application of advanced analytics to discern patterns from the data
- Visualization to identify potential failure patterns

These vendors may also include capabilities around creation of alerts and workflow to support decision processes. These capabilities can be applied to a broad spectrum of different types of equipment. Most asset analysis tools are general in terms of their capabilities, while a few target a specific class of asset. They can be used strategically or tactically as part of a more comprehensive asset management strategy.

**Other APM Ecosystem Products**

The market is also supported by products that aren't APM solutions but serve an essential role in the APM ecosystem. These include platforms that provide APM capabilities through a combination of both native capabilities and third-party product integration partnerships. Data historians such as AVEVA Historian, GE Proficy and OSIsoft primarily provide the operational data necessary to support APM. The historian's data infrastructure (data and models) also has been used by customers as a platform to build unique CbM solutions.

The decision about which APM solutions and techniques to use is driven by the types of assets an organization needs to manage, as well as available solutions. While some APM vendors can provide all of the capabilities required to support APM strategies, no APM vendor can manage all classes of assets across all industries. Gartner collected data through vendor interactions and client interactions for the purpose of demonstrating vendor capabilities in four functional APM categories. Figure 5 illustrates the field-proven capabilities of vendors represented in this Market Guide. It is not a complete list of existing solutions, but it does include the major APM vendors.
Figure 5: Capabilities of Representative Vendors

### Capabilities of Representative Vendors

<table>
<thead>
<tr>
<th>Capabilities by APM Product</th>
<th>ARMS Reliability</th>
<th>Aspen Technology</th>
<th>AVEA*</th>
<th>Bently Systems*</th>
<th>Detection Technologies*</th>
<th>DNV GL</th>
<th>GE Digital</th>
<th>Hitachi ABB Power Grids*</th>
<th>IBM</th>
<th>IPS Group</th>
<th>SAP*</th>
<th>SAS</th>
<th>Siemens*</th>
<th>Uptake</th>
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<tr>
<td>Condition-Based Maintenance (CbM)</td>
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</tbody>
</table>

Source: Gartner

* Capabilities listed are provided by multiple products of different origins (see Representative Vendors section).

Table 2: Representative Vendors in Asset Performance Management Software

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Headquarters</th>
<th>Product Names</th>
<th>Current Version</th>
<th>APM Product Type</th>
</tr>
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<tbody>
<tr>
<td>ARMS Reliability</td>
<td>Australia</td>
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<td>Asset Analysis Product</td>
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<tr>
<td>Aspen Technology</td>
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<td>aspenONE Asset Performance Management</td>
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<td>Asset Analysis Product</td>
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</table>

Representative Vendors

Market Introduction

Table 2 displays details of the representative vendors in asset performance management included in this research.
<table>
<thead>
<tr>
<th>Company</th>
<th>Country</th>
<th>Product</th>
<th>Version/Edition</th>
<th>Category</th>
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<tbody>
<tr>
<td>AVEVA</td>
<td>U.K.</td>
<td>Predictive Asset Analytics and Condition Management</td>
<td>Predictive Asset Analytics version R2 and Condition Management 3.1</td>
<td>APM Platform</td>
</tr>
<tr>
<td>Detech System Solutions</td>
<td>U.S.</td>
<td>Analysis and Enbase</td>
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<td>Norway</td>
<td>Cascade</td>
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<td>U.S.</td>
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<td>Hitachi ABB Power Grids</td>
<td>Switzerland</td>
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<td>IPS Group</td>
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<td>Germany</td>
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<td>U.S.</td>
<td>SAS Asset Performance Analytics</td>
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<td>Asset Analysis Product</td>
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</tbody>
</table>
Source: Gartner (October 2020)

The vendors listed in this Market Guide do not imply an exhaustive list. This section is intended to provide more understanding of the market and its offerings.

Vendor Profiles

ARMS Reliability

ARMS Reliability is a privately held asset management software and advisory services vendor established in 1995, with headquarters in Australia. The majority of its clients are located in Australia, North America and Western Europe. The company has a client base spanning a range of industries.

ARMS Reliability’s latest release is OnePM 6.1 (released in August 2020), which supports devising and enhancing asset strategies by capturing and reviewing data from all sources. Together with Asset Management Solutions, it augments proactive strategy formulation and optimizes plant maintenance and reliability. Enhancements with the latest release include SAP S/4HANA certification, Risk Register (which enables an organization to capture, record and manage strategic organizational risks within OnePM) and Integrity and Inspection Management framework.

In partnership with Isograph, the company also supports a range of reliability tools, like Isograph’s Availability Workbench, Reliability Workbench, and FaultTree+, for detailed reliability, risk and availability assessment.

Prepackaged Interfaces:

- EAM: JD Edwards EnterpriseOne and SAP (S/4HANA certified 2020)
- GIS: Not Reported
- AIP: Copperleaf

System Integrators: Not Reported
Aspen Technology

Aspen Technology (AspenTech) is a public company providing asset optimization software and services. It was founded in 1981 and is headquartered in Bedford, Massachusetts. The majority of APM clients are located in North America, Western Europe and Latin America. The company has a client base spanning a range of industries.


Aspen Mtell is a predictive analytics and prescriptive maintenance asset management solution that can be applied to a broad range of assets. The product can provide prescriptive guidance on the root cause of an issue with advice on how to change operations to avoid damage-causing conditions and/or instructions for service and repair activities. It leverages machine learning, which indicates impending failure and sends notifications. Aspen Fidelis Reliability performs asset risk management by identifying significant causes of lost operational availability that limit system production.

Prepackaged Interfaces:

- EAM: SAP
- GIS: Not Reported
- AIP: Not Reported

System Integrators: Accenture, Emerson, Orbis, PinnacleART and Spartan Controls

AVEVA

AVEVA is a publicly held engineering and industrial software company headquartered in Cambridge, U.K. The 2018 merger with Schneider Electric’s industrial software business expanded the company’s engineering, planning and operations, asset performance, and monitoring and control solution portfolio. The majority of its APM customers are located in North America, Western Europe, the Middle East, and India and span a range of industries.

AVEVA offers an integrated portfolio with several APM products delivered in a module approach. These include AVEVA Predictive Analytics (latest release 2019 R2 in December 2019), AVEVA Asset Strategy Optimization (latest release of 8.3.0.49 in December 2019) and AVEVA Condition Management (latest release in October 2019). Also included are capabilities that support RCM with fault diagnostics and asset risk management through AVEVA Operational Safety Management and...
the AVEVA Insight cloud platform. Mobile Operator Rounds is their solution offering for an offline mode of use for data collection and data analysis.

The 2019 MaxGrip acquisition brings three additional APM software products to AVEVA. The first is AVEVA Asset Strategy Optimization (previously MaxGrip Optimizer+), which interfaces with IBM, Infor, SAP and Ultimo Software Solutions’ EAM systems. It incorporates failure modes, effects and criticality analysis (FMECA)/reliability-centered maintenance (RCM), risk-based inspection (RBI), root cause analysis (RCA), and compliance management functionality, in combination with simulation, spare-part optimization, dashboard and reporting functions. With access to AVEVA Asset Library for AVEVA System Platform (previously MaxGrip Asset Libraries), AVEVA Asset Strategy Optimization can be used in offline mode. The second APM software product is AVEVA Asset Strategy Optimization for Maximo (previously MaxGrip strEAM+), which embeds APM functionality in IBM Maximo and includes six modules that vary from RCA, RCM and RBI models to maintenance and compliance management. The third product is AVEVA Asset Strategy Implementation (previously MaxGrip APMSmartApps). This includes cloud-native, light apps to simplify and enable APM in SAP EAM, compatible with (hybrid) cloud platforms and integrations. The majority of its legacy MaxGrip APM product customers are located in Western Europe, Asia/Pacific and North America. Its customers span a broad cross-section of industries, with a concentration in oil and gas, chemicals, utilities, and food and beverage.

Legacy APM product list in AVEVA APM product portfolio:

- Optimizer+ is now AVEVA Asset Strategy Optimization, latest version 8.3.0.49, released December 2019.
- Asset Library is now AVEVA Asset Library, latest version 8.3.0.49, released December 2019.
- PRiSM is now AVEVA Predictive Analytics, latest version 2019 R2, released December 2019.
- strEAM+ is now AVEVA Asset Strategy Optimization for Maximo, latest version 4.3.1, released November 2017.
- APMSmartApps is now AVEVA Asset Strategy Implementation, latest version 1.2, released March 2019.
- Condition Manager is now AVEVA Condition Based Maintenance, released October 2019.

AVEVA has extended the cloud deployment to Microsoft Azure. The acquired libraries with failure modes and maintenance strategies are integrated in the three products and extended for use in AVEVA Insight, AVEVA CBM and AVEVA Predictive Analytics. The MaxGrip APM Assessment service to identify a customer’s APM maturity and support the APM 4.0 journey is productized by AVEVA as well.

Prepackaged Interfaces:
Bentley Systems

Bentley Systems (Bentley) is an independent software vendor (ISV) based in Exton, Pennsylvania. Bentley offers its AssetWise Suite of APM products, including products from its acquisition of Ivara and C3global. Most AssetWise customers are in North America and Western Europe and span a range of industries.

Bentley’s latest release is AssetWise CONNECT Edition. The product launched in September 2018 with release version enhancements continuous in an agile development process. AssetWise Asset Lifecycle Information Management (ALIM) provides visualization, geospatial referencing, and structured control of asset information and managed change throughout the asset life cycle beyond just APM. AssetWise Asset Reliability supports core APM functions with a map-based, mobile offering for inspections. AssetWise Operational Analytics is an operational intelligence/predictive analytics product that serves three primary functions — operational data capture, data analysis and visualization/reporting. It is complementary to AssetWise Asset Reliability, with limited overlap. AssetWise Enterprise Interoperability facilitates the interoperation of multiple data sources and includes predefined connectors for many third-party systems such as ERPs and EAMs. In October 2019, Bentley released its AssetWise Digital Twin Services, which combine engineering, reality, GIS and IoT data. This product launch comes in addition to the 2018 activity by the vendor to include the acquisitions of Alworx, a data science company, and ACE enterprise, an enterprise software interoperability provider. Bentley also released a joint product in collaboration with Siemens’ Power Generation Services division, APM for Power Plants. The APM solution for power generation is part of the Siemens’ MindSphere digital platform and combines Bentley’s APM expertise with Siemens’ extensive operations and maintenance experience, fleet data and domain knowledge. Bentley reports that 40% of its APM customer base is on-premises with 60% on cloud/hosted (most are on subscription model).

In addition, Bentley partnered with Siemens to provide a combined product called PlantSight (launched in early 2019) for process industries. PlantSight leverages Siemens’ MindSphere, COMOS and XHQ with Bentley’s iTwin Services, OpenPlant, AssetWise and interoperability services to provide plant visualization and analysis capabilities.

Prepackaged Interfaces:

- **EAM:** IBM, Infor, Oracle and SAP
- **GIS:** Esri
- **AIP:** Not Reported

System Integrators: Accenture, EOH and Wipro
Detechtion Technologies

Detechtion Technologies is a private APM software and service provider based in Houston, Texas. Its customers are mostly in the upstream and midstream sectors of the oil and gas industry. The majority of clients are located in North America and Australia.

Detechtion has two APM products — Enalysis and Enbase. The latest releases are Enalysis version 5.0 (July 2020) and Enbase version 4.4. (May 2020). It offers its Enalysis product for gas compression fleet monitoring, alerting and optimization as a cloud-based service only. The product was built over many years of gas compressor troubleshooting service engagements and has few direct competitors. The vendor’s APM offering is 100% hosted and uses proprietary algorithms to determine the exact operating status of compressors from both production and maintenance viewpoints. This can be delivered through multiple platforms, including computers, tablets and phones and in offline mode. It also offers remote workers with no access to the internet a comprehensive set of PDF reports delivered by email for review as they travel through their oil and gas routes. Detechtion also offers the complementary mobility product Fieldlink.

Several enhancements have been made to the latest product releases, such as a new public RESTful API in both Enbase and Enalysis to support better integration with external systems, including EAM software. A new directory server implementation allows for single sign-on between our Enbase and Enalysis products as well as customer directory server integration. And a new Enbase Asset Monitor IoT device is designed for lower-cost asset monitoring applications.

Prepackaged Interfaces:

- EAM: Not Reported
- GIS: Not Reported
- AIP: Not Reported

System Integrators: Alitek, Exile Automation, Techneaux and W-Industries

DNV GL

DNV GL, a privately held company headquartered in Norway, is a provider of classification, technical assurance, software and advisory services. The majority of its clients are located in North America and Western Europe. Its primary client base is in oil and gas and utilities. However, the company has a growing number of shipping and chemical process manufacturer clients. DNV GL has several APM-related products.
Its utility-oriented software Cascade (latest version 3.70, released in July 2019), for technical asset management and predictive maintenance, consolidates equipment diagnostics, nameplate and real-time data, providing equipment statuses. Further, it monitors and analyzes data to help asset owners prioritize maintenance and form replacement strategies. Cascade Foresight (version 1 released June 2018) provides capabilities for operators to predict the remaining life of transformers, circuit breakers, switchgear, cables and other assets. The utility-specific software interfaces with a wide variety of test equipment, as well as real-time and asset repository data, and allows SCADA and online-monitoring data to be automatically evaluated and captured as equipment reads.

Its oil-and-gas-oriented software helps in the design phase through its reliability, availability and maintainability (RAM) analysis product, which allows companies to simulate the entire lifetime performance of an asset in terms of availability, production efficiency and profitability. The Synergi Plant and Synergi Pipeline products allow companies to capture, integrate and visualize data. Other functionalities of the suite include hazard analysis tools, risk analysis tools and QRA software for offshore installations and safety.

Prepackaged Interfaces:

- EAM: IBM Maximo, Oracle and SAP
- GIS: Esri
- AIP: Copperleaf

System Integrators: PwC

GE Digital

GE Digital is the software division within publicly held global industrial conglomerate GE. In December 2018, GE Digital launched a new IIoT software company by merging GE Digital with GE Power Digital Solutions and GE Grid Solutions. GE Digital is headquartered in San Ramon, California. The majority of its APM customers are located in North America and Western Europe, with presence in all regions globally. The APM product is deployed on GE Digital and non-GE Digital assets in a variety of industries. Some are served by GE Digital business units and others are not. Industries include oil and gas, utilities, aviation, healthcare, chemical, steel, mining, semiconductor, automotive, pulp and paper, food and beverage, and CPG.

GE Digital has streamlined APM to be a horizontal solution built on the Predix Platform, which can be contextualized for industry verticals. GE Digital offers two APM products. One product is Predix APM for cloud, with the latest release version 4.4 in April 2020. The cloud product offers capabilities of APM health, reliability, strategy and integrity in a Predix cloud environment. The recent release includes capabilities for APM Integrity's Compliance Management, which addresses risk of missed inspections on regulated equipment. GE Digital also released an update to Asset
Answers on Predix, which offers benchmarking capabilities. The second product is APM Classic on-premises (including Meridium and SmartSignal), with the latest release of 4.4 in April 2020. The APM Classic suite includes four applications: APM Health, to standardize the collection, modeling and analysis of data; APM Reliability, for predictive diagnostics; APM Strategy, to develop and manage asset maintenance strategies; and APM Integrity, for asset integrity and compliance. The solutions offer an offline mode of use. GE Digital reports that 60% of its APM customer base is on-premises, with 40% on cloud/hosted (most are on perpetual licenses).

In recent years, GE Digital has acquired a number of companies. In 2019, it acquired Baker Hughes APM Commercial Assets. Augmenting its 2016, acquisitions of Bit Stew Systems (data management and integration), Meridium and Wise.io (machine learning). GE Digital offers a number of APM-focused solutions acquired over several years, including SmartSignal and GE Digital Proficy Historian, as well as new Predix APM applications.

Prepackaged Interfaces:

- EAM: IBM and SAP
- GIS: Not Reported
- AIP: Not Reported

System Integrators: Accenture, Capgemini, Deloitte, PwC and TCS

**Hitachi ABB Power Grids**

Hitachi ABB Power Grids is a joint venture entity formed on 1 July 2020 between Hitachi (80.1%) and ABB (19.9%), with approximately $10 billion in business volume. The newly created company is headquartered in Zurich, Switzerland. APM is part of Digital Enterprise, Hitachi ABB Power Grids’ portfolio of software, services and hardware. Its APM clients are located in North America, Latin America, Western Europe and China and are mainly in the utilities, mining and transportation industries.

Hitachi ABB Power Grids Enterprise Software Solutions product group provides a suite of software products, including two APM products: (1) Digital Enterprise APM (formerly Asset Health Center); and (2) Asset Suite Equipment Reliability (formally ER Suite).

Hitachi ABB Power Grids’ latest release is Digital Enterprise APM version 6.0 (June 2020). Digital Enterprise APM is available either on-premises or in the Microsoft Azure cloud and can be delivered as a SaaS solution. In its recent release, enhancements include multiyear risk prognostics and what-if simulations, enhanced asset intelligence and an expansion of the asset model library across power generation, mining and transportation industries. Asset Suite Equipment Reliability (release version varies by module) was designed as a solution to help enforce standards related to equipment reliability and work management, specifically to support INPO AP-913 compliance in the nuclear power industry. It has been folded under the Asset Suite banner.
IBM

IBM is a publicly held global technology and consulting corporation with headquarters in Armonk, New York. IBM offers Maximo Asset Performance Management. The majority of IBM Maximo APM customers are located in North America and Western Europe, with presence in all regions globally.

IBM offers its Maximo APM portfolio of modules. It combines Maximo Asset Monitor, Maximo APM - Health (formerly Asset Health Insights), Maximo Predict (formerly Predictive Maintenance Insights), and Maximo Assist (formerly Equipment Maintenance Assistant). The four offerings can be delivered in a single, preintegrated Maximo Application Suite or separately. These offer cross-industry and equipment-agnostic models and enhanced industry-specific packages, such as APM for Energy and Utilities. The Maximo Application Suite is positioned in IBM’s AI applications group. The solutions offer an offline mode of use. The products are deployed in a broad cross-section of asset-intensive industries, including mining, oil and gas, utilities, power, transportation, manufacturing, and aviation.

IBM’s APM solution, Maximo Asset Performance Management, provides condition monitoring, asset health assessment, replacement planning, risk and criticality analysis, predictive failure models, and FMECA tools, in addition to the full set of core EAM functionality. The company has predictive and AI-assisted maintenance capabilities provided through its AI tools and capabilities with data science. IBM reports industry-specific APM offerings planned to augment their current offering of APM for energy and utilities, which adds utility industry-specific capabilities to the APM portfolio such as more than 50 prebuilt asset-class models (for circuit breakers, transformers and poles among other things). It is based on the CIM industry standard data model and provides utility-specific criticality models and asset visualizations. IBM reports that 75% of its APM customer base is on-premises, with 25% on cloud/hosted (most are based on number of assets and user seat licenses).

Prepackaged Interfaces:

- **EAM**: IBM Maximo
- **GIS**: Esri
- **AIP**: Not Reported
IPS Group

IPS Group is a privately held software company headquartered in Germany. The APM product is primarily deployed in the utility sector, with a majority of the company’s APM clients located in Western Europe, Eastern Europe, Australia, Asia and North America.

The company’s APM product, IPS-SYSTEMS Asset Performance Management version 1.9.3.105 (released in May 2020), is part of the IPS-SYSTEMS platform. APM functionality is natively integrated with the company’s asset management, reliability-centered maintenance, mobile workforce management, CIM-based network model management and CIM-based outage management solutions. The functionalities offered include maintenance decision support, maintenance concept definition, asset investment analytics, asset condition analytics, risk management, asset end-of-life simulation, integrated planning, user configurable maintenance analysis and mobile workforce management. Also included are offline mode capabilities and mobile access to technical documentation and a geolocation interface. The product can be deployed on-premises or in the cloud and offers comprehensive types, models and analytical libraries shared across the entire customer base. The product is aligned to ISO 55000 and PAS 55, Common Information Model (CIM) IEC 61970, IEC 61968 as well as VDE-0109-1-2 standards.

In its latest release, product updates include enhancements to the analytical APM library with out-of-the-box analytics, analytic updates to the RCM module and improved visual analytics with machine learning.

Prepackaged Interfaces:

- **EAM**: ABB Ability Ellipse, ABB Ability Asset Suite EAM, IBM Maximo, IPS EAM and SAP
- **GIS**: Esri
- **AIP**: Copperleaf

System Integrators: Accenture, Atos, Hatch, Schneider Electric, Siemens Energy, Siemens OMNETRIC and Wipro

SAP

SAP is a publicly held global enterprise application software vendor based in Walldorf, Germany. SAP provides four APM-focused products: (1) SAP Predictive Maintenance and Service; (2) SAP Asset Strategy and Performance Management; (3) SAP Predictive Engineering Insights; and (4) SAP Asset Intelligence Network. These are integrated with SAP’s Enterprise Asset Management (EAM) solution largely based on the PM module. The company’s primary APM client base is located in Western Europe, North America, Middle East and Eastern Europe, with a presence in most regions globally. Its APM clients span a range of industries.
The latest version of SAP’s APM products was released in 3Q20 under version 2008. The four mentioned APM applications are available via cloud only, with quarterly enhancement releases. SAP has formed a partnership with AsInt to provide RBI capabilities, which are available from the SAP App Center. Product enhancements have been completed in the areas of asset risk and criticality assessments, RCM assessments as well as inspection checklists. SAP Asset Intelligence Network has added equipment request information from operators to OEMs and has introduced the baselining capability of a model and equipment to capture a snapshot that is used as a reference point. SAP Predictive Maintenance and Service introduced new machine learning capabilities. SAP Predictive Engineering Insights has introduced more advanced engineering simulation capabilities. SAP APM suite is also mobile-enabled through Fiori, as well as connectivity to SAP Asset Manager mobile solutions, and includes 3D visual experience such as work instructions.

SAP offers integration to its own IoT platform, as well others in addition to third-party data sources (such as data historians). This is used to load asset data collected via sensors to be stored in SAP HANA, the company’s in-memory DBMS, and has certified interfaces with data historians. SAP’s CbM capability is provided through the SAP Plant Maintenance (PM) module (EAM solution). It is also provided through SAP’s APM solution, SAP Predictive Maintenance and Service.

In July 2020, a partnership was announced between SAP and Siemens. This partnership will allow SAP to offer Siemens’ Teamcenter software as the core foundation for product life cycle collaboration and data management, and Siemens will offer SAP Intelligent Asset Management and SAP Portfolio and Project Management software to maximize the business value for manufacturers and operators across networks.

Prepackaged Interfaces:

- **EAM**: SAP ERP, ECC 6.0 + Plant Maintenance and S/4HANA Asset Management
- **GIS**: SAP Geographical Enablement Framework for EAM/ArcGIS by Esri
- **AIP**: Not Reported

System Integrators: Accenture, Deloitte, DXC Oxygen, Havensight and Vesta Partners

**SAS**

SAS is a privately held global business intelligence, analytics and data science ISV. It is headquartered in Cary, North Carolina, and was founded in 1976. Although it has clients across the globe, its primary APM customer base is located in North America, Western Europe and Latin America. SAS’s APM business is distributed across the energy, oil and gas, and manufacturing industries.

SAS offers an APM solution — SAS Asset Performance Analytics (first released under the name SAS Predictive Asset Maintenance, which is now part of the SAS Quality Analytic Suite).
product integrates with other SAS products in the SAS Quality Analytic Suite, including SAS Field Quality Analytics and SAS Production Quality Analytics. The latest version is 6.3, released in April 2020. SAS Asset Performance Analytics uses a variety of analytical approaches, including time series regression and neural networks to model failure modes for specific assets. The solution offers online and offline modes of use. SAS also offers a complementary solution, SAS Analytics for IoT, version 7.2, released in September 2020, which allows users to easily access, organize, select and transform IoT data.

SAS entered a partnership in 2019 with Siemens. Both organizations are identifying joint use cases in the area of product quality, leveraging computer vision technology. Some of the target verticals include manufacturing, food and beverage, automotive, and medical devices.

Prepackaged Interfaces:

- EAM: Not Reported
- GIS: Esri
- AIP: Not Reported

System Integrators: Accenture, Deloitte and Wipro

Siemens

Siemens is a publicly held global industrial conglomerate headquartered in Germany. The majority of its APM customers are located in Western Europe, North America and the Middle East, with clients spanning a range of industries. Siemens provides its APM capabilities through both its MindSphere IoT-as-a-service solution, which delivers an integration of other third-party products and through the Siemens Omnivise Digital Services Platform. Siemens offers four APM ecosystem products across different divisions, which interface with the MindSphere and Omnivise Digital Services Platform. They include:

- MindSphere (version 3 was released in January 2018, and since has continuously been updated monthly as a SaaS offering)
- APM for Power Plants version 7.12, released in September 2020 (hosted in Omnivise Digital Services Platform)
- Utility-specific Power Diagnostics Center (PDC) (latest release is PDC Light, hosted in Omnivise)
- Condition Monitoring and Diagnostics (latest release PDC for Program Units, hosted in Omnivise)

MindSphere offers CbM and RCM capabilities through its Asset Performance Monitoring application, and predictive analysis through its Advanced Analytics App. MindSphere is deployed
primarily as a hosted solution, which included releases on Amazon Web Services (AWS) in January 2018, Microsoft Azure in May 2018 and Alibaba Group in September 2018. There is also an on-premises version available through a partnership with Atos that was released in April 2018.

Siemens APM for Power Plants and APM for Oil and Gas, the industry-specific solutions, are part of the Siemens’ Omnivise digital platform, and combine Bentley’s asset performance management expertise with Siemens’ operations and maintenance experience, fleet data and domain knowledge. Predictive analytics, FMEA, condition indicators and equipment health are built into Siemens’ proprietary asset models and delivered as starter content. The PDC product focuses on: (1) early detection of abnormal operating conditions of power equipment to help improve plant availability; and (2) operation equipment to help improve plant availability and operations. An offline mode of use is offered in all the products. The products are aligned with industry standards such as ISO 55000 and ISO 27001.

In July 2020, a partnership was announced between Siemens and SAP. This partnership will allow SAP to offer Siemens’ Teamcenter software as the core foundation for product life cycle collaboration and data management. Siemens will offer SAP Intelligent Asset Management and SAP Portfolio and Project Management software to maximize the business value for manufacturers and operators across networks. Siemens partners with Bentley to provide a combined product called PlantSight (launched early 2019) for process industries. PlantSight leverages Siemens’ MindSphere, COMOS and XHQ with Bentley’s iTwin Services, OpenPlant, AssetWise and Interoperability Services to provide plant visualization and analysis capabilities.

Prepackaged Interfaces:

- EAM: Oracle and SAP
- GIS: Not Reported
- AIP: Not Reported

System Integrators: Atos, Bentley, Chemtech, Deloitte, Hint, IT Vizion, Software AG and TCS

Uptake

Uptake is a privately held industrial AI software vendor headquartered in Chicago, Illinois. It was founded in 2014. The company offers APM applications, recently renamed as Uptake Compass, Uptake Scout and Uptake Radar, in addition to a suite of sales, service and industry-specific AI-based applications. The majority of its APM customers are located in North America and target several industries, including utilities, manufacturing, energy, mining, transportation, defense, public sector and facilities.

In April 2018, Uptake acquired Asset Performance Technologies (APT), a provider of APM content and software, and has since integrated its capabilities into Uptake Compass and Uptake Radar. Uptake offers advanced analytics, including predictive and prescriptive maintenance. Additionally,
it offers O&M cost analysis and the ability to enhance scheduled maintenance planning by providing what-if scenarios of maintenance tasks with economic impact. Uptake Compass and Uptake Radar leverage curated datasets such as weather, geospatial data, market metrics and traffic. Asset Strategy Library (ASL) provides an extensive library of reliability and preventive maintenance (PM) information, failure modes and asset maintenance strategies for industrial equipment.

Prepackaged Interfaces:

- EAM: Not Reported
- GIS: Not Reported
- AIP: Not Reported

System Integrators: Not Reported

**Market Recommendations**

Although a comprehensive APM platform solution would deliver value for almost any organization, all the components of these types of solutions may not be needed by most organizations. The value should be weighed against the investment and total cost of ownership. More specifically, when evaluating APM options, consider:

- Whether the organization has a business capability plan that would require APM.
- Whether the vendor and product have proven capabilities for your desired asset maintenance activities and classes of assets within your industry, and if they align with your asset management strategy.
- The importance of good quality data in your EAM systems. Assess your data quality, and if there are deficiencies, invest in upgrading your EAM systems and/or initiate an asset data-cleansing project before investing in APM.
- The importance of integration with EAM. Ensure there is an interface to your EAM to be able to execute APM recommendations directly in the transactional EAM system.
- The value of integration with other complementary technologies such as mobile and GIS products.
- The importance of sufficient, secure, sustainable, relevant and curated time series OT data. If the data doesn't exist or is not accessible, then invest in deploying sensors and process data management infrastructure before embarking on an APM project. Additionally, look at the underlying governance of the OT systems to ensure you have a documented, secure and stable basis for OT data architecture. If you are considering APM-as-a-service options, determine if
outsourcing the core competency of data analysis is beneficial in your long-term plan, or alternatively, if you should build competencies in-house.

- The APM vendor's experience with your specific use case. Does it have customers already using the product to manage the performance of similar assets? Most APM vendors serve a variety of industries and asset types, but some are quite specific and are developing “domain expertise” offerings. Pick a solution that fits your scope and budget.

- The alignment between the vendor's APM product roadmap and your own long-term equipment reliability strategy (assuming you have one). Not all APM vendors have an expansive product strategy. If your long-term plan includes expanding the scope of the solution to encompass different assets and different approaches to managing their performance, then invest in an APM platform vendor solution. If your organization only needs to support specific analytical approaches or specific classes of assets, then an APM asset analysis vendor may be more suitable.

- The ability of the solution to support collaboration across the organization, as well as with external business partners such as OEMs. Cloud technology is changing asset management collaboration dynamics and opening the door to new asset management business models. If you are considering a more collaborative asset management model, invest in APM solutions that support, or will support, the necessary collaboration.

Evidence

Gartner received vendor briefings and associated material from 14 APM vendors (most have global reach, but some are only regional) from January through April 2020. Gartner also surveyed secondary research sources for information on market trends and vendor activity.

Note 1: Representative Vendor Selection

- The 14 vendors named in this guide were selected to represent the three market segments as discussed in the Market Analysis section: platform vendors, asset analysis vendors and other ecosystem offerings. For each of these three categories, we list vendors in which Gartner has received the most client interest.

- APM should not be confused with EAM, although integration between the two is common for triggering work orders in all levels of functional capabilities listed above, and many EAM vendors have invested in some level of APM. APM is designed for decision support; EAM is designed for maintenance execution. For more information on EAM, please see Magic Quadrant for Enterprise Asset Management Software. Some EAM vendors have an APM product strategy; most rely on partnerships with APM vendors. Sourcing an APM solution that is compatible with your EAM solution provides more ready-to-use integration.
Similarly, APM should not be confused with AIP. Integration of AIP with both APM and EAM is common in order to include data on asset condition, maintenance costs, criticality, budgets and risks, and then analyze it to produce capital investment plans over extended time. APM is designed to support safe, reliable and efficient operation of equipment and infrastructure, while AIP is designed to support both short- and long-term capital investment decisions. AIP is used most heavily by local governments and regulated utilities, but is also increasingly used in other industries, such as oil and gas, transportation, facilities and telecom, and is of interest to manufacturing and healthcare industries. (See Optimize Utility Capital Expenditures With Asset Investment Planning Solutions.) The two solution types often use the same data and similar analytical techniques, but for different purposes. There is no overlap between APM and AIP solution providers.

Document Revision History

Market Guide for Asset Performance Management Software - 26 June 2019
Market Guide for Asset Performance Management Software - 25 June 2018
Market Guide for Asset Performance Management - 8 March 2017

Recommended by the Authors

Magic Quadrant for Enterprise Asset Management Software
Transmission and Distribution Utilities Context: 'Magic Quadrant for Enterprise Asset Management Software'
Survey Analysis: Mitigate the Risks in EAM Functional Immaturity
3 Practices Utility Company CIOs Should Include in an Integrated EAM-GIS Solution Strategy
Mapping a Route to Asset Management and Reliability
Financially Optimized Maintenance Planning Using Asset Performance Management
Optimize Utility Capital Expenditures With Asset Investment Planning Solutions
Utility Mobile Workforce Management and Horizontal Field Service Management Systems Provide Different Capabilities to Utilities
Market Guide for Mobile Workforce Management Systems for Utilities
Magic Quadrant for Field Service Management

Recommended For You

Survey Analysis: EAM Functional Satisfaction in 2020
The Difference Between Enterprise Asset Management and Field Service Management
2020 Strategic Roadmap for IT/OT Alignment
Supporting Initiatives

Manufacturing IT Optimization and Modernization

Energy and Utilities Technology Optimization and Modernization

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