Market Guide for Enterprise Asset Management Software

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By Analyst(s): Kristian Steenstrup, Nicole Foust

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EAM is a business application used by manufacturing and other asset-intensive industries to optimize maintenance and repair of industrial plants and equipment. CIOs can use this guide for insights on EAM offerings to make the best technology decisions to support asset management activities.

Overview

Key Findings

- Market interest is shifting to overall asset strategies and process flow, which in turn, increase system complexity, expanding scope and overall investment budget.
- EAMs are complex IT systems designed for asset inspection and maintenance work execution, integrated with ERP and operational data, so implementations can take a year or longer.
- The terms computerized maintenance management system (CMMS) and enterprise asset management (EAM) are often used interchangeably by vendors and buyers, but should not be considered the same.
- The market is progressing through a significant upgrade/replacement phase, with many Gartner clients inquiring about alternatives to their current vendor.
- Cloud delivery is strongly promoted by vendors and, while it dominates in other IT application categories, on-premises deployments are still common in EAM.
- Industry variations continue to drive unique functional extensions, particularly in key areas like linear asset management and fleet maintenance.

Recommendations

CIOs involved in manufacturing and other asset-intensive industries looking to use IT to improve business performance should:

- Establish project success criteria by evaluating their organizations' process maturity, business goals, risk tolerance, risk appetite and change readiness. Do this by engaging key stakeholders, including the technicians in the business, and ensuring vendor selection criteria are not just about product but also about system integrators' delivery options.
- Evaluate an EAM upgrade, replacement or installation by considering if your ERP vendor offers sufficient EAM functionality and planned commitment, balanced against the lower cost and complexity of in-house integration. If not, then look at EAM point solutions and their integration to your ERP environment by asking for production proof points for ERP integration.
- Examine the scope of functionality required (particularly in procurement and maintenance, repair and operation [MRO] supply chain) and the scalability needed for multisite deployment to determine if you are really looking for a high-end EAM or a lower-end EAM (aka CMMS).
- Assess cloud offerings, bearing in mind that cloud may not be cheaper in the long run, and may constrain the ability to configure, customize and integrate the product. This is particularly relevant for multitenant SaaS offerings.
- Identify vendors with your industry-specific capabilities by including criteria requiring vendors to demonstrate proven linear asset capability if you are in an industry that requires it (e.g., pipes, wires, rail). Similarly, if you operate a fleet (e.g., vehicles, wind turbines), include specific functionality criteria for managing fleet maintenance programs.

Strategic Planning Assumptions

Through 2024, predictive maintenance and other asset-performance-management-related functions will continue to be delivered outside of the EAM product, but increasingly by the same vendor.

Through 2024, ease of deployment and ease of use will be major influencing factors in software selection.

Market Definition

This research is focused on organizations in asset-intensive industries. Such organizations use EAM software products to address physical asset (industrial infrastructure, plant and equipment) support requirements. EAM is primarily a transactional workflow system designed for the purposes of managing capital asset maintenance by managing asset data and work processes. This includes asset maintenance history data and a linear, or hierarchical, asset register. The software supports scheduled maintenance tasks based on historical records or OEM vendor guidance. An alternative term used for EAM is “computerized maintenance management system” (CMMS). These systems are generally considered to be small-scale, single-site applications with less functionality around parts management and resource scheduling. However, there is no strict definition enforced, and terminology and definitions vary by vendor.

For additional information on market definition and product functionality, see Notes 1, 2 and 3.

Market Description

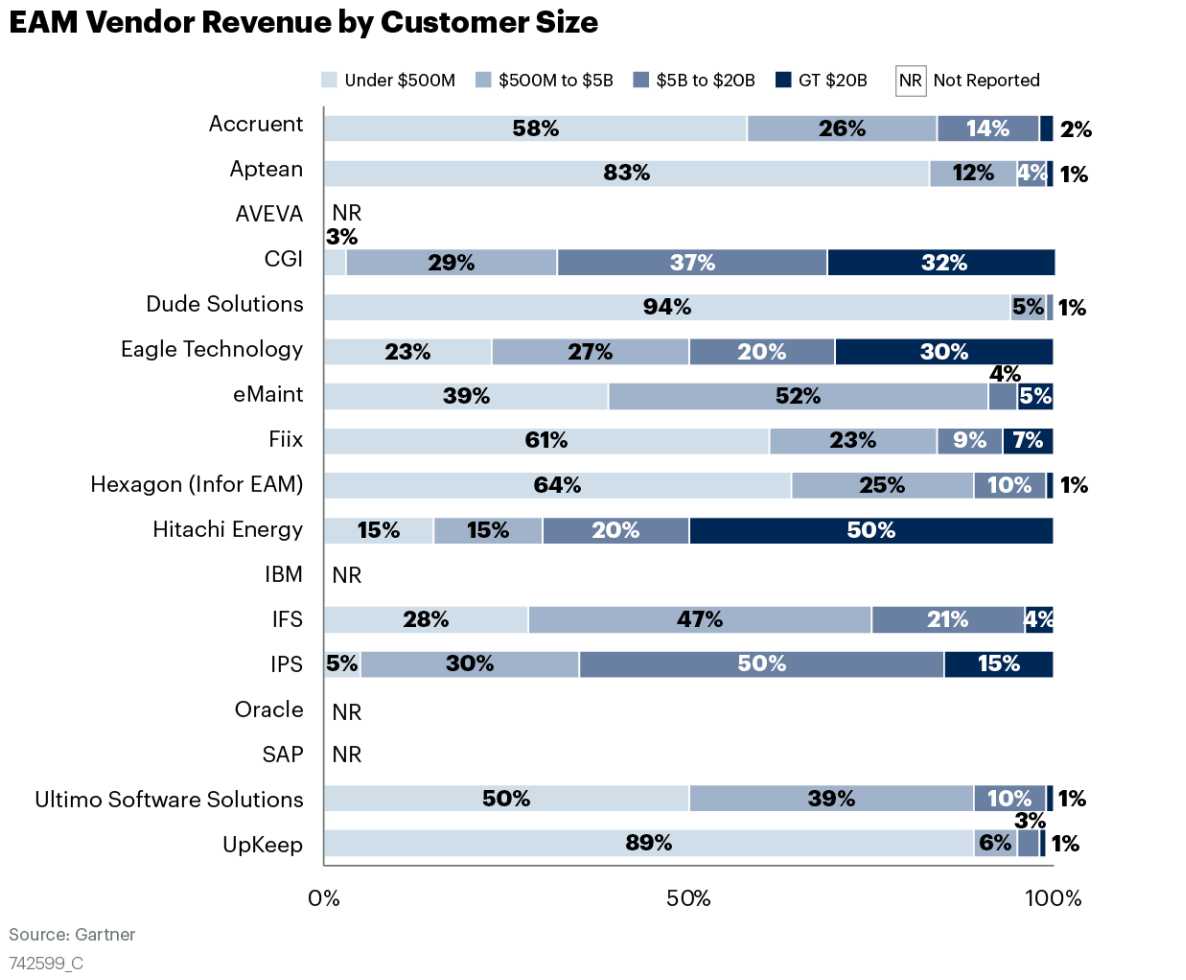
EAM as a market is still relatively fragmented by industry and geography with multiple viable vendor offerings. Customer loyalty and stickiness of the customer relationship are strong given the end-user characteristics and the preference for continuity with minimal disruption. Despite this, there continues to be activity in the sector, evidenced by EAM acquisitions (e.g., Rockwell Automation (Fiix) and Hexagon (Infor EAM); retiring (e.g., AVEVA Enterprise Asset Management); and acquisitions of EAM services organizations (e.g., Advoco, an Accenture company, and Cohesive, a Bentley Systems company).

This research focuses on the needs of organizations in asset-intensive industries, particularly manufacturing, natural resources, transportation and utilities. The use of EAM in aviation is not considered. Such use is considered a specialized area due to the component-based nature of tracking repairs and replacement and the extensive use of outsourcing, as well as the adherence to industry-specific standards and reporting.

EAM applications are designed to scale to more than 100 concurrent users and run across multiple sites from a single central database. EAM caters to whole-of-business requirements, rather than departmental or site requirements, like CMMS does traditionally (see Quick Answer: What's the Difference Between Computerized Maintenance Management and Enterprise Asset Management Systems?). It should also be able to support on-premises, cloud or hosted deployments. Finally, it should be designed to integrate with other relevant enterprise applications — such as ERP, procurement and HR — which is necessary for managing the overall business of asset-intensive organizations.

EAM vendors have some variation in their customer size as some are more appealing to, or focus on, smaller organizations. Many of these vendors would be considered to be on the cusp of CMMS, but are included here for their functional completeness and scalability. Figure 1 provides EAM revenue by customer size, as reported by the vendors based on their 2020 installed base of EAM contracts (not all vendors provided data for this category).

Figure 1: EAM Vendor Revenue by Customer Size



Not all EAM products provide all functional capabilities, and matching those to your requirements should be a major part of product evaluation. Where there are gaps, it may be possible to fill them with third-party and partner products, so that should not necessarily exclude a vendor from consideration. Figure 2 provides EAM product functional capabilities as reported by the vendors and how they are delivered. This is *not* a qualitative assessment of capability, but only a statement of whether it is included, optional or provided by a third party.

Figure 2: EAM Functional Capabilities by Vendor

EAM Functional Capabilities by Vendor

● Full Native Capability in Core EAM Product ◑ Native Capability Depends on Product/Licensing ○ Available Through Third-Party Integrations □ None

	Vendor Name	Accruent	Aptean	AVEVA	CGI	Dude Solutions	Eagle Technology	eMaint	Fiix	Hexagon (Infor EAM)	Hitachi Energy	IBM	IFS	IPS	Oracle (WAM/WACS)	Oracle Corp. (Fusion Cloud)	SAP	Ultimo Software Solutions	UpKeep
Core EAM	Planning and Scheduling	●	●	●	●	●	●	●	●	●	●	●	●	●	●	◑	●	●	●
	Work Management	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Asset Management	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Inventory Management	●	●	●		●	●	●	●	●	◑	●	●	●	●	●	●	●	●
	Purchasing and Receiving	●	●	●		●	●	◑	●	●	◑	●	●	●	●	◑	●	●	●
	Condition-Based Maintenance (CbM)	●	●	◑	●	●	●	●		●	◑	●	○	◑	●	●	●	●	○
Industry Extension	Named Industry Extension									◑		◑	◑	◑	●		◑		
	Linear Assets			●	●	◑		●		●	●	●	●	●	●	◑	●	●	
	Fleet Management	●		●		●		●		●	●	◑	●	●	●	◑	●	●	
APM	RCM	●		◑	◑	●		●		●	◑	◑	○	◑	●		◑		○
	Predictive Analytics	●		◑	◑	●	●	◑	◑	●	◑	◑	○	◑	●	●	◑		○
Other	Calibration		●			●	○	◑		◑		●	○	●	●	●	●	●	
Product Option	EAM Point Solution (to integrate with an ERP solution)	●	●	●	●	●	●	●	●	●	●	●	●	●	●			●	●
	EAM as part of an ERP suite-based offering										●		●			●	●		

Source: Gartner
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Organizations also need to make key technology architectural decisions, such as choosing between an EAM point solution approach or an ERP suite solution, as part of their EAM selection processes (see bottom line of Figure 2).

Market Direction

EAM is a mature software market from a functionality perspective, but that does not mean it is stagnant. Vendors' product investments, their associated delivery capabilities and resulting changes in client satisfaction drive product differentiation for the market and drive further vendor investment and acquisition activity. This is also evident in the related sector of specialist EAM service organizations.

In the last 12 months — based on 500 client interactions on EAM product selection and utilization — we have seen that asset-intensive organizations evaluate and rearchitect their digital technology platforms. They are evaluating technology consolidation and enterprisewide technology initiatives wherein they can optimize, and eventually minimize, the use of redundant tools and applications across the organization. An example of this is the frequent joint offering of EAM and asset performance management (APM) from many vendors (see Market Guide for Asset Performance Management Software) as well as EAM and mobile workforce management/workforce management (MWM/WFM) or field service management (FSM).

It is clear, based on inquiries from the last 12 months, that ease of use is a major determinant on product selection, and there are an increasing number of third-party extensions in the market for subjectively better front ends for prominent EAM products.

In the future, EAM vendors will need to consider not just capabilities surrounding physical maintenance, but also the maintenance and support of the embedded software in assets (OT).

Market in Significant EAM Upgrade/Replacement Phase

Over the last few years, the EAM market has progressed with asset-intensive organizations being generally between their second or third major EAM product upgrade or replacement. However, recent and frequent Gartner client interactions suggest that the EAM market is going through a significant replacement/upgrade phase. Partially, this is due to the availability of IoT sensors providing more opportunity for condition-based and predictive maintenance, but the majority is due to new and better EAM system versions being available.

Previous installations are cycling through upgrades to new generation platforms and to utilizing new work and operations capabilities and features such as mobility, analytics and OT/IoT integration. Legacy installations can no longer support the needs for asset maintenance and execution in an optimized and efficient manner with the advent of IoT sensor data. Additionally, as organizations evaluate and compose their asset management and operations strategies, there are decision points on “upgrade or replace” since the upgrade cost on some complex customized EAM deployments is close to the cost of replacement.

Vendors are not always helping the situation. They no longer support older versions, and a number of them have released new versions of products and new pricing structures and are persuading or forcing clients to move to the cloud (which potentially benefits vendors more than clients in many cases). This creates significant negative sentiment, resulting in existing EAM clients testing the market and looking at alternatives with more compelling deals and conditions. Once an organization is "in play" for an upgrade or a new EAM, the vendor runs the risk of losing it as a client.

Most asset-intensive organizations already have at least one EAM system, and some have standardized on one enterprisewide system. Organizations may have been using the same system for over 20 years. In addition, large organizations made substantial investments, including significant customizations, in their current systems and have had resource limitations or little appetite for switching providers because of the significant complexity. In all these ways, the EAM market is very much like the broader ERP market. It has experienced low, single-digit growth [1] and a low churn rate for several years. Regardless, the 2022 CIO survey indicated that 47% of manufacturing CIOs intend to invest in EAM in the next three years (see Figure 8 in 2022 CIO and Technology Executive Agenda: An Asset-Intensive Manufacturing Perspective).

The low churn rate has been a mixed blessing for users. On one hand, support for legacy versions of products has been extended by a number of EAM vendors, removing any external pressure to upgrade or replace existing deployments. However, product development continues unabated, and all vendors assessed in this research released new versions of their products in the first half of 2021. Legacy applications can also be difficult and costly to maintain, particularly given the number of customizations common in older deployments. More disruption is expected in the wake of Infor EAM, long a mainstay of this sector, being sold to Hexagon [2] and Fiix, one the more recent additions to the market being acquired by Rockwell Automation. [3]

Market Analysis

In this market sector, clients need to look at their overall application portfolios and plan how their EAM solutions will interact with other related asset management applications, such as asset investment planning (AIP) and APM (see Mapping a Route to Asset Management and Reliability). The Gartner definition of EAM does not include APM or AIP, though some EAM vendors provide a subset of APM such as predictive maintenance or reliability-centered maintenance (RCM). In some cases, they may include AIP functionality (though typically in a separate product). Most EAM vendors have partnerships with APM and/or AIP vendors (see Market Guide for Asset Performance Management Software and Optimize Utility Capital Expenditures With Asset Investment Planning Solutions for more on these products).

Based on the relative importance of working assets to the overall success of the business, and the complexity of "fitting in" a new EAM, an organization should select the vendor that best fits its application and integration architecture. At the same time, the vendor must offer the right functionality for the organization's portfolio of equipment. Long-term vendor and product viability are factors in most customer evaluations, and potential buyers should examine current profitability, as well as a long-term commitment to EAM, the product and their industry.

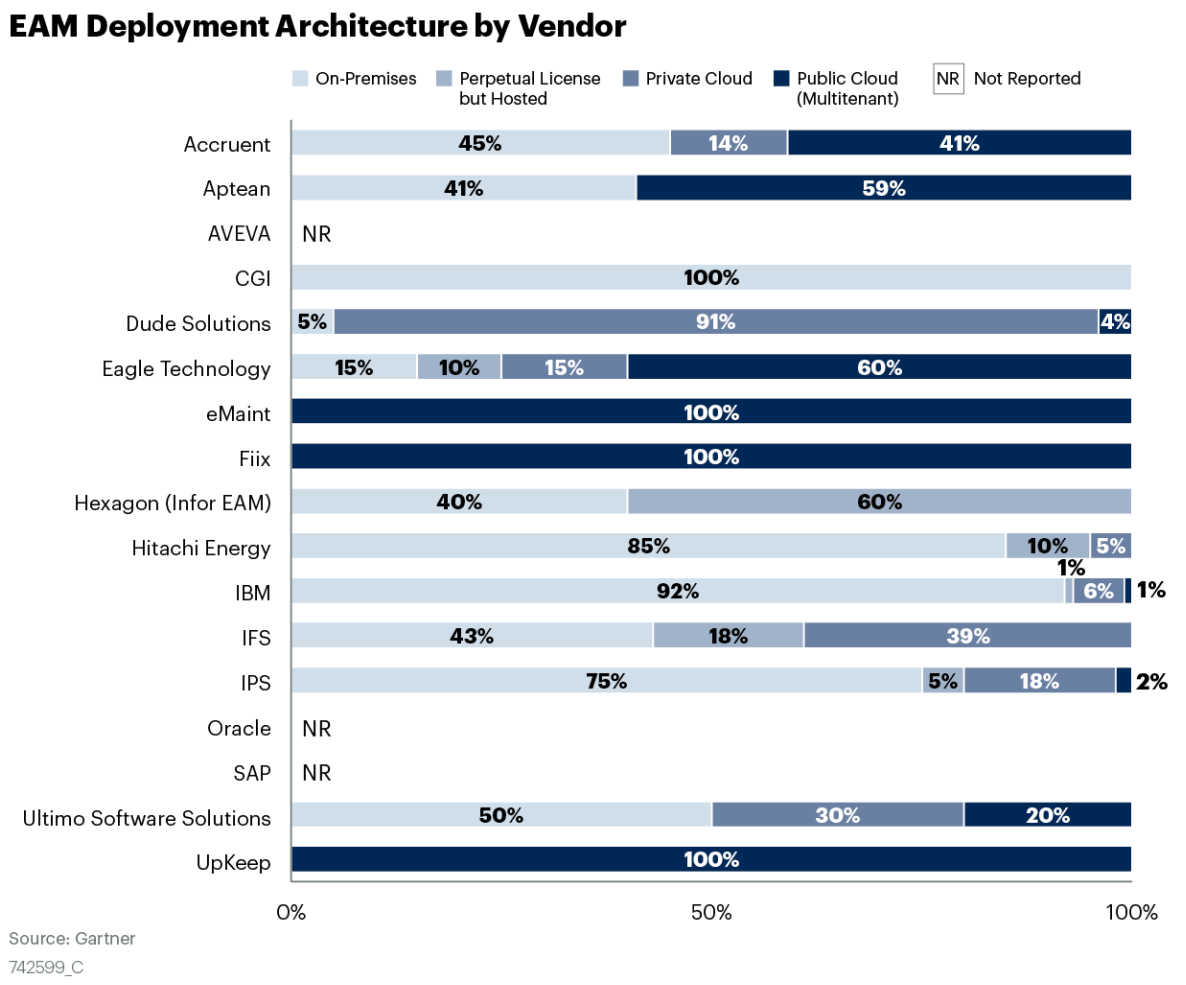
EAM Product Deployments Are Split on Cloud and On-Premises Delivery

In addition to a large number of vendors modernizing their architectures, cloud-based alternatives are becoming more commonly available, with some vendors being exclusively cloud-based (see Cloud-Based Enterprise Asset Management Continues to Face Headwinds). The cloud-based alternatives will not always appeal to organizations in the EAM market, but an increasing number of organizations that face capital, business and operational constraints are considering cloud as a deployment option. Gartner's research found that organizations are choosing cloud-based EAM alternatives only where there is an enterprisewide initiative to move away from managing on-premises IT infrastructure and applications, so on-premises EAM continues to be the preferred deployment by a significant margin.

Many vendors heavily promote cloud-based EAM, but market response remains muted outside of smaller organizations and manufacturing. Some vendors offering multitenant public cloud versions of their products provide a more limited functionality and integration capability, so customers need to be aware of the differences between public and private cloud offerings, even from the same vendor.

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. Gartner surveyed vendors for the percentage of EAM customer deployments by delivery model to assess their product delivery by architecture. The vendors shown in Figure 3 supplied the percentages (with the overall total for each vendor equal to 100%) of their 2020 EAM revenue by deployment.

Figure 3: EAM Deployment Architecture by Vendor



Source: Gartner
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EAM Vendor Geographic and Industry Reach

Although the scope of this Market Guide is global, some vendors focus on specific geographies and may be small globally but significant regionally, so do not choose vendors based on size alone. Therefore, consult with the authors on your needs, location and industry subsector, such as transportation, manufacturing, oil and gas (upstream, midstream or downstream), mining and metals, power generation (nuclear, renewable or hydroelectric), transmission and distribution, or water/wastewater, and process.

Gartner surveyed EAM 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 their 2020 EAM revenue by geographic region. We can see from this data that some vendors are narrowly focused on one or two geographic regions, and some are more broadly positioned. Depending on where your operations are located, this may influence your vendor shortlist.

Figure 4: 2020 EAM Installed Base by Geography

2020 EAM Installed Base by Geography

50%-100% | 20%-49% | 10%-19% | 4%-9% | 0.1%-3% | 0% | NR Not Reported | NA Not Available

Geographic Region:	Accruent	Aptean	AVEVA	CGI	Dude Solutions	Eagle Technology	eMaint	Fiix	Hexagon (Infor EAM)	Hitachi Energy	IBM	IFS	IPS	Oracle	SAP	Ultimo Software Solutions	UpKeep Technologies
North America			NA								NR			NR	NR		
Latin America			NA								NR			NR	NR		
Western Europe			NA								NR			NR	NR		
Eastern Europe			NA								NR			NR	NR		
Middle East			NA								NR			NR	NR		
Africa			NA								NR			NR	NR		
India			NA								NR			NR	NR		
Japan			NA								NR			NR	NR		
China			NA								NR			NR	NR		
Other Asia			NA								NR			NR	NR		
Australia/NZ/Pacific			NA								NR			NR	NR		

Source: Gartner
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Gartner surveyed EAM vendors to assess their proportional coverage of global markets by industry. The vendors shown in Figures 5a and 5b supplied the percentages (with the overall total for each vendor equal to 100%) of their 2020 EAM revenue by industry subsector installed base. We can see from this data that some vendors are narrowly focused on one or two industry sectors, and some are more broadly positioned. Depending on what industry you are in, this may influence your vendor shortlist.

Figure 5a: 2020 EAM Installed Base by Industry

2020 EAM Installed Base by Industry

50%-100% | 20%-49% | 10%-19% | 4%-9% | 0.1%-3% | 0% | NR Not Reported | NA Not Available

Vendor Name:	Accruent	Aptean	AVEVA	CGI	Dude Solutions	Eagle Technology	eMaint	Fiix	Hexagon (Infor EAM)	Hitachi Energy	IBM	IFS	IPS	Oracle	SAP	Ultimo Software Solutions	UpKeep
Oil and Gas																	
Upstream (Exploration and Production)			NA						NR	NR	NR			NR	NR		
Midstream (Pipelines, Terminals)			NA						NR	NR	NR			NR	NR		
Downstream (Refining, Petrochemicals)			NA						NR	NR	NR			NR	NR		
Oilfield Service Companies			NA						NR	NR	NR			NR	NR		
Power Generation																	
Fossil Generation			NA						NR	NR	NR			NR	NR		
Nuclear			NA						NR	NR	NR			NR	NR		
Hydro			NA						NR	NR	NR			NR	NR		
Renewables (Wind, Solar, etc)			NA						NR	NR	NR			NR	NR		
Transmission and Distribution																	
Electrical T&D			NA						NR	NR	NR			NR	NR		
Gas Distribution			NA						NR	NR	NR			NR	NR		
Water/Wastewater			NA						NR	NR	NR			NR	NR		
Other Energy			NA						NR	NR	NR			NR	NR		
Process Industries																	
Chemicals			NA						NR	NR	NR			NR	NR		
Life Sciences			NA						NR	NR	NR			NR	NR		
CP, Food and Beverage			NA						NR	NR	NR			NR	NR		
Forest Production			NA						NR	NR	NR			NR	NR		

Source: Gartner

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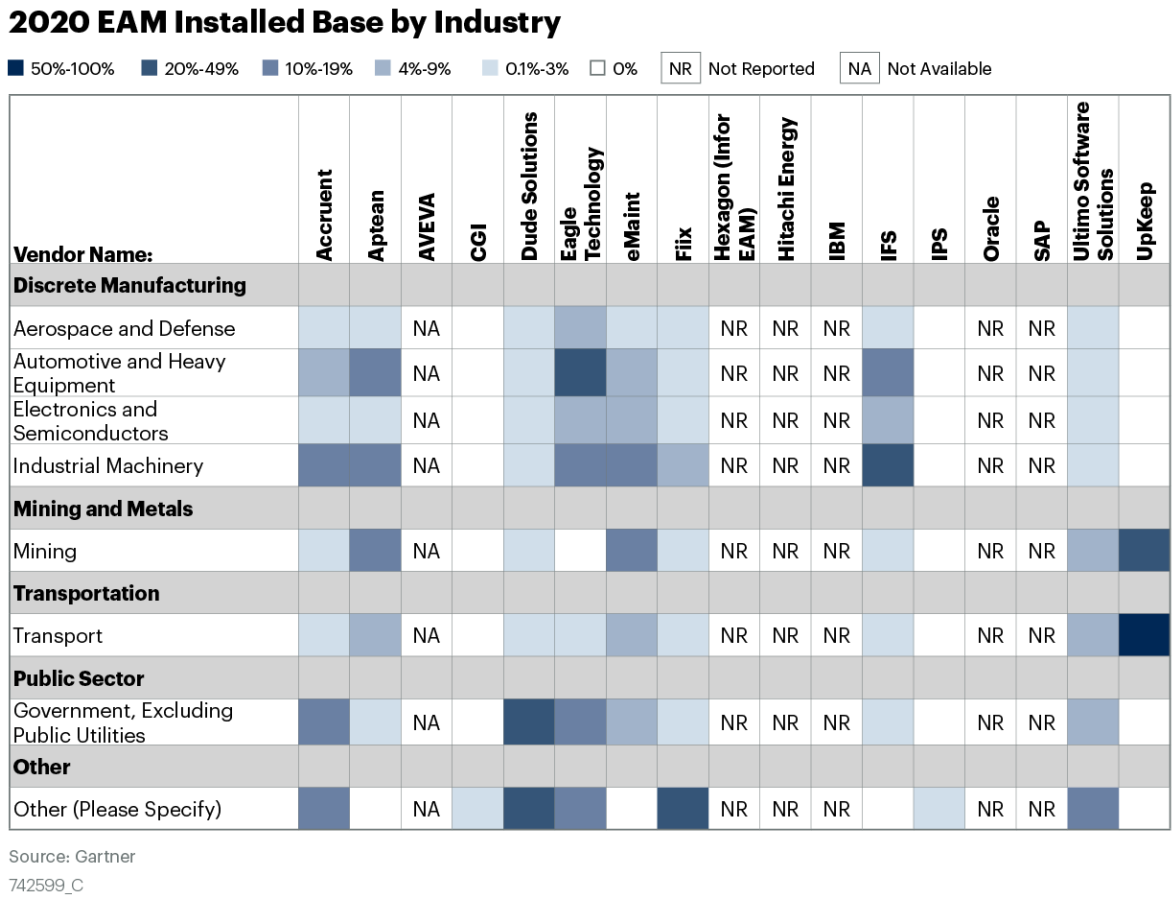
Figure 5b: 2020 EAM Installed Base by Industry



Vendor Name:	Accruent	Aptean	AVEVA	CGI	Dude Solutions	Eagle Technology	eMaint	Fiix	Hexagon (Infor EAM)	Hitachi Energy	IBM	IFS	IPS	Oracle	SAP	Ultimo Software Solutions	UpKeep
Discrete Manufacturing																	
Aerospace and Defense			NA						NR	NR	NR			NR	NR		
Automotive and Heavy Equipment			NA						NR	NR	NR			NR	NR		
Electronics and Semiconductors			NA						NR	NR	NR			NR	NR		
Industrial Machinery			NA						NR	NR	NR			NR	NR		
Mining and Metals																	
Mining			NA						NR	NR	NR			NR	NR		
Transportation																	
Transport			NA						NR	NR	NR			NR	NR		
Public Sector																	
Government, Excluding Public Utilities			NA						NR	NR	NR			NR	NR		
Other																	
Other (Please Specify)			NA						NR	NR	NR			NR	NR		

Source: Gartner
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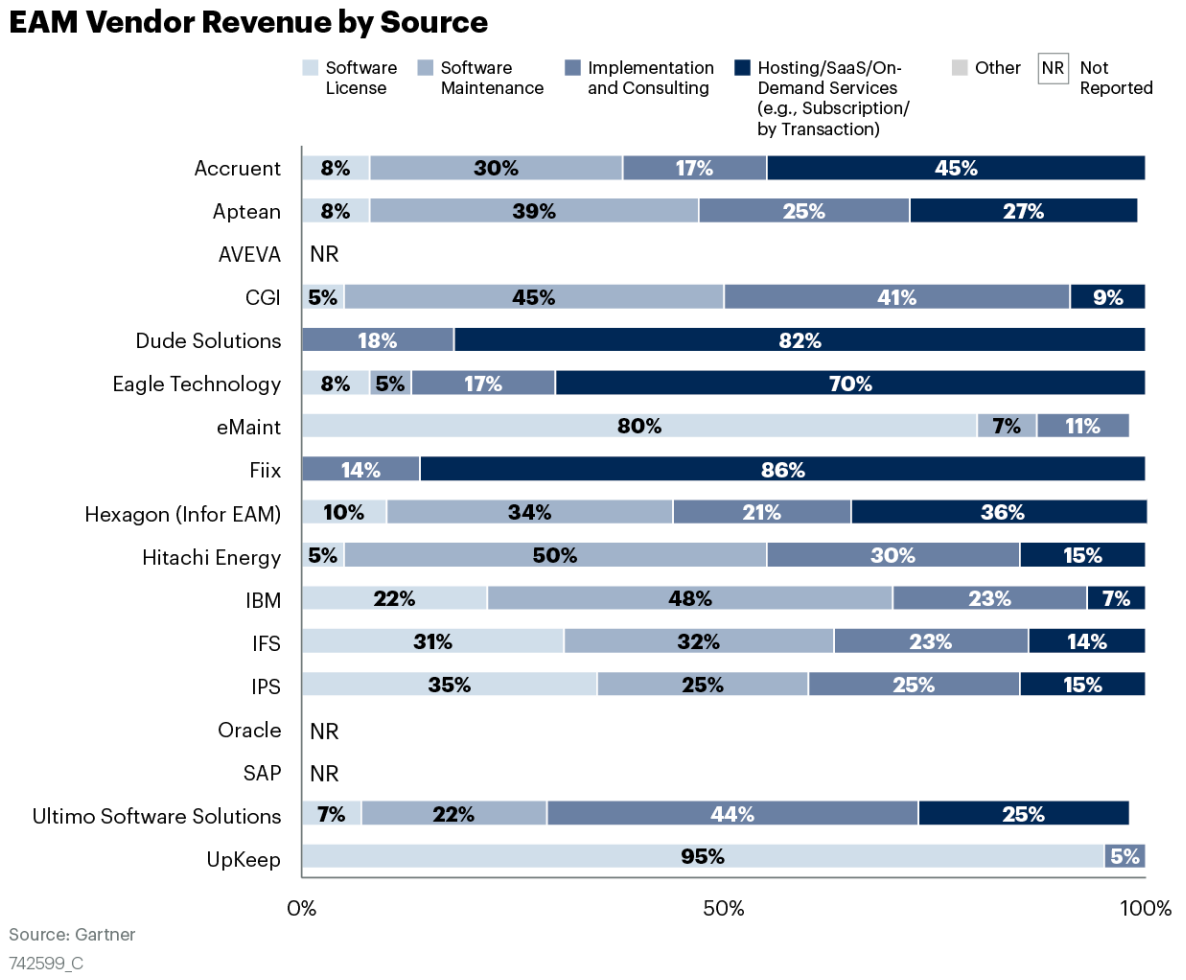
Gartner surveyed EAM vendors to assess their proportional revenue by products and services. The vendors shown in Figure 6 supplied the percentages (with the overall total for each vendor equal to 100%) of their 2020 EAM revenue by category. This reveals their dependence solely on software, versus their own in-house implementation and consulting. In some cases of SaaS delivery specialists, this reflects their ease of deployment; but for vendors of on-premises and large scalability products, clients should evaluate the availability of third-party system integrators if their preferred vendor has little consulting revenue.

Figure 6: EAM Vendor Revenue by Source



Source: Gartner
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Market Guide analysis represents conditions at a specific point in time. To be consistent and complete in the analysis, Gartner stops all data collection after a cutoff date. The questionnaire cutoff date for this Market Guide was 1 September 2021.

This Market Guide evaluates many EAM vendors in the market, but is not intended to be an exhaustive list of all possible vendors, solutions or products. It is a valuable tool for assessing and comparing multiple solutions and vendors. However, clients are encouraged to develop a clear understanding of their own objectives and requirements, and to use this Market Guide in conjunction with inquiries with Gartner analysts.

Representative Vendors

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.

Market Introduction

Vendors included in this Market Guide have demonstrated their ability to provide licensed, SaaS or multiple delivery options that support EAM customers across a range of asset-intensive industries. The overall EAM software market is estimated to be $1.85 billion. [1]

Organizations using this Market Guide to evaluate vendors for an EAM project shortlist should consider the variations in requirements that reflect their own specific needs based on the industry sector and geography in which they operate.

Table 1 displays details for the representative vendors in EAM software that were included in this research.

Table 1: Representative Vendors in Enterprise Asset Management Software

(Enlarged table in Appendix)

Vendor	Product Name
Accruent	Maintenance Connection
Aptean	EAM TabWare Edition EAM API Pro Edition EAM
AVEVA	AVEVA Enterprise Asset Management (discontinued sales as of 31 December 2021)
CGI	CGI OpenGrid360
Dude Solutions	Dude Solutions EAM Suite
Eagle Technology	Proteus MMX
eMaint	eMaint CMMS
Fiix	Fiix CMMS
Hexagon (Infor EAM)	Infor EAM
Hitachi Energy	Asset Suite EAM Ellipse EAM Digital Enterprise
IBM	IBM Maximo Asset Management Maximo Application Suite (MAS)
IFS	IFS Enterprise Asset Management Cloud
IPS	IPS ENERGY
Oracle	Oracle Utilities Work and Asset Management (WAM) Oracle Utilities Work and Asset Cloud Service (WACS) Oracle Fusion Cloud Maintenance
SAP	S/4HANA ECC 6.0S/4HANA Cloud (public cloud)
Ultimo Software Solutions	Ultimo Enterprise Asset Management
UpKeep	UpKeep EAM

Source: Gartner (December 2021)

Vendor Profiles

Accruent

Accruent's Maintenance Connection product was acquired in July 2018 by Fortive, a publicly held organization headquartered in Everett, Washington, in the U.S. Fortive also indirectly owns eMaint. Fortive treats them as two independent operations with similar target markets. Although referred to on the Accruent website and in literature as a CMMS product, we consider Maintenance Connection an EAM solution based on our definition.

Maintenance Connection reports that most of its customers are in facilities management, process and discrete manufacturing (as well as other industries). It also has smaller numbers of customers in other industries, including oil and gas, power generation, transmission and distribution, and water/wastewater. The vast majority of its customers are small to midsize organizations based in North America, with about 10% of customers elsewhere. The pricing model is based on concurrent or named users, with the majority subscription-based licensing on public cloud deployments.

The company sells to and supports its customers directly in the U.S. (more than 90% of customers) with partners serving customers outside the U.S., in the U.K., Australia, Canada and the Middle East. The HTML5-enabled product offers all core functionalities, as well as predictive analytics, geospatial information systems (GIS), condition-based maintenance (CbM) and RCM APM capabilities. The company provides integration to Accruent's Meridian Server (engineering document management), and this will enable support for building information modeling (BIM). Maintenance Connection's recent updates and enhancements include reporting, asset filtering, GraphQL API, bar code reading, mobile reporting and part requester.

Accruent reports 79 new EAM customers since January 2021. It has noted the following publicly shareable EAM customers: Alaska Airlines, Trinchero Family Estates, City of Orlando (FL), Towson University.

Prebuilt Third-Party Interfaces

ERP: Aptean, Infor, Lawson, Microsoft Dynamics GP, Microsoft Dynamics 365, Oracle, Oracle's JD Edwards EnterpriseOne, PeopleSoft, Sage,SAP and SAP Ariba

GIS: Esri, Mipela GeoSolutions

APM: None Reported

AIP: Copperleaf and Remsoft

System Integrators: Hagerman, Precast and Solicad

Aptean

Aptean is a privately held EAM vendor based in Georgia in the U.S. Its main EAM offering is Aptean EAM TabWare Edition. Aptean also acquired the EAM API PRO Edition product through the purchase of OPTIWARE in May 2019, and continues to provide it as a separate offering. Aptean has merged the two products into a single new offering, Aptean EAM version 11.1, which the company states is commercially available now for North America and Europe clients. New EAM customers for Aptean will be directed to the Aptean EAM product, with existing customers expected to be migrating to the new product in 2022. Aptean EAM TabWare Edition has significant cloud delivery experience. (Note: For this report, Aptean provided data that represents functionality, capabilities and customers, which are aggregated across the three products; potential buyers should evaluate individual product specifics.)

Aptean's domain knowledge and experience is primarily in small and midsize businesses (up to $5 billion in revenue) across a wide range of asset-intensive industries. Support is provided for 21 CFRPart 11 and ISO 55000. EAM TabWare Edition offers mobile capabilities for approvals, stores, work execution, inspections and analytics, and is primarily sold in the North America market. EAM TabWare Edition supports core EAM functionality, in addition to CbM and calibration, but with limited RCM capabilities. The product offers three levels of implementation models: remote, configuration and best practices. Aptean's end-to-end process manufacturing solution suite integrates manufacturing execution system (MES), EAM, ERP and warehouse management system (WMS) capabilities. EAM API PRO Edition is primarily represented in EMEA with little North American presence. It is targeted at small and midsize manufacturers and is 21-CFRPart 11-compliant. The pricing model for Tabware Edition, API Pro edition and the new EAM product is based on named or concurrent users, with the majority as subscription-based licensing for public cloud deployments.

Aptean reports 17 new EAM TabWare Edition customers since January 2021. Aptean has noted the following publicly shareable EAM TabWare Edition customers: enfinium, Leggett & Platt, Sonoco, Tootsie Roll Industries, UFP Industries, and Upstate Niagara Cooperative.

Prebuilt Third-Party Interfaces

ERP: JDE, Microsoft Dynamics AX/GP, Oracle, Sage, SAPGIS: None Reported

APM: None Reported

AIP: None Reported

System Integrators: None Reported

AVEVA

AVEVA is a publicly held engineering and industrial software company headquartered in Cambridge, U.K. The AVEVA Enterprise Asset Management product has a long history in the EAM market, having come from the recent Schneider Electric merger, stemming from Schneider Electric's previous acquisition of Invensys. AVEVA EAM is found in a large cross-section of industries around the world. Approximately half of its revenue comes from a diverse set of energy and utilities subsectors (particularly hydroelectric and water), as well as process industries and oil and gas organizations.

AVEVA has announced to customers that all new sales of EAM will cease on 31 December 2021. Support will continue until 31 December 2026, and official retirement begins on 1 January 2027. Although the product life cycle is frozen (no new features development planned), AVEVA has committed to one release per year over the five-year period that will address maintenance of the product.

AVEVA's stated intent is to offer a vendor-agnostic approach to EAM, working to ensure integration with its APM platform. It currently has technology partnership agreements in place with Limble CMMS, Ultimo EAM and IBM Maximo to help address the various sizes and complexity of customers. All will offer integration with the AVEVA Insight APM package based on these partnership agreements.

CGI

CGI is a publicly held global business process services and system integration firm with headquarters in Montreal, Canada. Its EAM product, part of CGI's OpenGrid360 offering, is currently deployed in the utilities industry (transmission and distribution) within North America, with European expansion planned. The majority of its customers are medium to large utilities. Unusually, its pricing model is based on the size of the client, rather than on named or concurrent users, with 100% perpetual licensed on-premises deployments.

The OpenGrid EAM software is built on a web-enabled architecture and is HTML5-based, which allows access from a browser. The product offers most core EAM functionality to include planning and scheduling, work management, asset management, and inventory management (but not purchasing). It also includes linear assets, RCM and CbM. OpenGrid EAM includes integrated mobile workforce products: OpenGrid Workforce and its OpenGrid Field solutions.

CGI partners with Arcadis Gen (SEAMS Enterprise Decision Analytics) for predictive analytics and AIP capabilities. OpenGrid enables compliance with ISO 55000:2014 and has the technical controls that support 21 CFR Part 11 compliance.

CGI declined to report the number of new EAM customers since January 2021. CGI has noted the following publicly shareable EAM customers: Con Edison of New York, Dominion Energy, Duke Energy, and Los Angeles Department of Water and Power.

Prebuilt Third-Party Interfaces

ERP: None Reported

GIS: Esri, GE, Hexagon, IQGeo

APM: None Reported

AIP: Arcadis

System Integrators: CGI

Dude Solutions

Dude Solutions is a privately held software as a service (SaaS) provider headquartered in North Carolina in the U.S. Dude Solutions provides asset and operations management solutions to facilities, manufacturing, mining, oil and gas, and transportation organizations. Most clients are in North America, with a smaller presence in Western Europe and Australia, with the product being offered in 17 languages. The largest portion of EAM customers is primarily small-tier organizations. Dude Solutions refers to its system as a CMMS, but it meets our criteria as an EAM. Primarily, software is delivered as a SaaS model, but some clients have perpetual licenses. About half the licenses are based on an enterprise model and half on a concurrent user model.

Dude Solutions EAM Suite of modules includes: Asset Essentials, Confirm, Capital Predictor (an AIP), Work Management, Inventory Management, and Purchasing & Receiving. Linear assets and fleet management are supported in the Confirm module. APM-related features such as CbM, predictive forecasting and RCM are supported across several modules: Asset Essentials, Confirm and Predictor. The product supports ISO 55000:2014 standards.

Recent product enhancements include: financial chargeback capabilities; GIS capabilities; UX updates to inventory management, work orders and work assignments; prebuilt APIs, permitting and licensing.

Dude Solutions reports 643 new EAM customers since January 2021. The company has noted the following publicly shareable EAM customers: City of Sydney, Department of Education Tasmania, City of Edinburgh Council, HNI, Marion County, National Highways England, and Rancho California Water District, Tekni-Plex.

Prebuilt Third-Party Interfaces

ERP: None Reported

GIS: Esri, MapInfo

APM: None Reported

AIP: None Reported

System Integrators: Alpha, BVNA, WithersRavenel

Eagle Technology

Eagle Technology a privately held pure-play asset management software provider headquartered in Wisconsin in the U.S. Most clients are in North America, with a smaller presence in Latin America, Western Europe, the Middle East, Africa, India, China and Australia. The product is offered in 27 languages. The EAM customer size ranges across small, midtier, large and extra-large organizations in facilities, government, manufacturing, transportation and water/wastewater. Eagle Technology refers to its system as a CMMS, but it meets our criteria as an EAM. The majority of deployments are named users on a hosted/SaaS model with a small proportion on perpetual licenses.

Eagle Technology offers its Proteus MMX CMMS product which provides all core EAM functionalities: planning and scheduling, work management, asset management, inventory management, purchasing and receiving. In addition to CbM, predictive maintenance and calibration are included in the product. Lockout/tagout (LOTO) integration is offered with a partnership Brady (LINK360 Safety Software). The product supports 21 CFR Part 11 and ISO 55000:2014 standards. Recent enhancements include machine ledger and call log capabilities, GIS and power BI integration.

Eagle Technology reports 38 new EAM customers since January 2021. Eagle Technology has noted the following publicly shareable EAM customers: Lear Corporation, Chicago O'Hare International Airport, Unilever, XPO Logistics

Prebuilt Third-Party Interfaces:

ERP: Microsoft Dynamics 365, Oracle, SAP, Infor SunSystems

GIS: Esri

APM: None Reported

AIP: None Reported

System Integrators: Honeywell, Radialis Medical, Unique Computer Systems, Johnson Controls

eMaint

eMaint CMMS is an EAM solution offered by Fluke, a manufacturer of industrial testing equipment. (eMaint refers to its system as a CMMS, but it meets our criteria as an EAM.) Fluke is owned by Fortive, headquartered in Everett, Washington, in the U.S., which also owns Accruent but treats them as two independent operations with similar target markets. Additional Fluke office locations are in Europe and Asia.

The product offers all core EAM functionalities, including MRO spares management, but with limited linear asset, fleet and calibration functionality. A mobile extension, eMaint MX Mobile, supports access via smartphones, tablets and mobile computers through a browser-enabled user interface. eMaint MX Mobile includes a “mobile SCADA” capability to enable technicians to respond to programmable logic controller (PLC)/SCADA alarms via eMaint’s work order management features. In addition to MX Mobile, eMaint can offer an application called Fluke Mobile as part of a full mobile solution. The Fluke Mobile product has full SCADA/work order capability, as well as offline functionality. The majority of its customers are small to midsize organizations across North America, Western Europe and Latin America, with a smaller presence in most regions globally. The EAM product is targeted at manufacturing, oil and gas, chemicals, life sciences, and food and beverage industries. Pricing models are based on named or concurrent users, or enterprise size, with 100% subscription-licensed public cloud deployments.

Fluke Accelix provides for integration with a wide ecosystem of IoT and remote monitoring sensors, including Fluke Sensors and Fluke Connect tools, which enable a strong CbM capability. eMaint X4 offers native RCM capabilities and partners for predictive and CbM. eMaint supports ISO 55000 standards and has the technical controls that support 21 CFRPart 11 compliance. eMaint provides a “no-code” integration tool, rather than specific integrations prebuilt. The product is well-suited to clients seeking a simple, straightforward EAM solution with minimal footprint and disruption.

eMaint reports 523 new EAM customers since January 2021. eMaint has noted the following publicly shareable EAM customers: Cintas, Dana, Henkel, Pratt & Whitney, Stanley Black & Decker, XTO Energy

Prebuilt Third-Party Interfaces

ERP: None Reported

GIS: None Reported

APM: None Reported

AIP: None Reported

System Integrators: None Reported

Fiix (A Rockwell Company)

Fiix, (A Rockwell Automation Company) is a publicly held industrial automation and asset management software provider headquartered in Ontario, Canada. Rockwell Automation acquired Fiix in December 2020. Fiix provides a maintenance management platform that combines mobile asset management, work order and parts management, an open integration network, and AI-driven analytics.

The majority of Fiix clients are in North America, with a smaller presence in many other regions globally. The product is offered in nine languages. The majority of EAM deployments are in small and midtier organizations in discrete manufacturing and transportation. Fiix refers to its system as a CMMS, but it meets our criteria as an EAM. Fiix CMMS provides all core EAM functionalities: planning & scheduling, work management, asset management, inventory management, purchasing and receiving. Recent enhancements include Fiix Foresight, an AI engine for maintenance with applied AI with Work Order Insights, Parts Forecaster, e-signatures on work orders and the Fiix Integration Hub for ease of core EAM extensibility. APM-related features are done by in-house modules.

Fiix acquired Alchemy IoT in August 2019. With the acquisition, Fiix combines its asset management solution and Alchemy's machine learning software to provide real-time, AI-driven asset health and anomaly detection.

Fiix reports 559 new EAM customers since January 2021. Fiix has noted the following publicly shareable EAM customers: Ardagh Group, Chewy, Henkel, Synagro, Ocado, Liberty Oilfield Services, Sara Lee.

Prebuilt Third-Party Interfaces

ERP: Microsoft Dynamics 365, NetSuite ERP, Oracle, SAP

GIS: None Reported

APM: None Reported

AIP: None Reported

System Integrators: None Reported

Hexagon (Infor EAM)

Hexagon, a publicly traded global technology company based in Sweden, announced in October 2021 the completion of its acquisition of Infor's global EAM (Enterprise Asset Management) business. Hexagon provides industrial and operational solutions such as field mobility and geospatial enterprise solutions supporting operational efficiency and digital transformation initiatives. The acquired Infor EAM product supports multiple asset-intensive industries, including energy, manufacturing, utilities, life science and transportation. From now until March 2022, the product will officially be known as Infor EAM (formerly a part of Infor).

The software is provided as a cloud or on-premises solution, although Hexagon states that it has a cloud-first delivery practice. It is sold and supported globally in most regions and supports 14 languages. Infor EAM supports all core EAM functionality, including support for linear assets and fleet management. The product also provides basic CbM, APM (predictive analytics and RCM capabilities), AIP and an established mobile capability on Android, iOS and Windows. Analytics historically provided by the Infor Birst offering will now be available via a licensing agreement between Infor and Hexagon. The acquisition by Hexagon includes older products MP2, Pacer and Spear. Reporting is provided by IBM Cognos Analytics, and Infor EAM OpenCAD is a solution from CAD Service that enables support for BIM-related concepts. Infor does not state the number of EAM customers on cloud; but among the customer references surveyed previously, the majority were on perpetual licenses, and nearly half were on-premises deployments. Infor EAM fully supports ISO 55000:2014 and 21 CFR Product 11 compliance. Recent product enhancements include APM enhancements: failure modes, effects and criticality analysis (FMECA); equipment ranking capabilities; failure consequences; performance calculations; decay curve improvements; compatible units; calibration; and scheduling enhancements.

Hexagon declined to report any new EAM customers since January 2021. Hexagon declined to provide publicly shareable EAM customers.

Prebuilt Third-Party Interfaces

ERP: Infor ERP, Microsoft Dynamics 365, Oracle, SAP

GIS: Esri

APM: None Reported

AIP: None Reported

System Integrators: Accenture, Advoco, Deloitte, Stratum Consulting Partners, Visual Knowledge, plus others.

Hitachi Energy

(No vendor confirmation of this content was received at the time of publication.)

Hitachi Energy is a joint venture (JV) consisting of Hitachi of Japan (80.1%) and ABB, based in Zurich, Switzerland (19.9%). The recently created company is headquartered in Zurich, Switzerland. EAM is part of Hitachi's Lumada portfolio, including the products Asset Suite EAM, Ellipse EAM, and its new merged product, Lumada EAM (previously Digital Enterprise). Its EAM clients are located in North America, Latin America, Western Europe and China and are mainly in the utilities, mining and transportation industries.

The Asset Suite product has been focused almost exclusively on the EAM market for power generation and large process industry organizations. Asset Suite is primarily deployed at large utilities in North America and Europe, with some deployments in Asia. The Asset Suite solution is compliant with INPO AP-913/INPO AP-928, and is in alignment with MIMOSA standards and IEC CIM. The JV offers multiple complementary products associated with Asset Suite, including Anywhere for Inventory and eSOMS (operator rounds, logs, clearances).

The Ellipse product is installed in a few different asset-centric industries, with utilities representing nearly half of its customer base. The geographic distribution of its customer base is broad, with 25% of its customers in Australia (the Ellipse product's original home base), 25% in the Americas and 50% in the rest of the world. Ellipse includes all core EAM functionality, including linear assets support, within the product. Ellipse also integrates with the LinkOne parts visualization tool, the Axis Procure-to-Pay Automation solution, Ellipse WFM and Ellipse APM. Ellipse is one of the few products in the market that can be installed either as an EAM point solution or a full ERP, and historically, it has its strongest base in mining, globally. Hitachi Energy has few cloud deployments of its EAM product. Hitachi Energy declined to report the number of new EAM customers since January 2021 and declined to provide a list of publicly shareable EAM customers.

Prebuilt Third-Party Interfaces

ERP: Not Reported

GIS: Not Reported

APM: Lumada APM (formerly Digital Enterprise APM and Asset Health Center); and Asset Suite Equipment Reliability (formerly ER Suite)

AIP: Copperleaf

System Integrators: Not Reported

IBM

IBM is a publicly held global technology and consulting corporation with headquarters in Armonk, New York in the U.S. Its Maximo Asset Management product is positioned within IBM's broader AI applications division, which brings increasing investment in EAM, integrated workplace management system (IWMS), supply chain, AI, IoT and analytics. Maximo is deployed in a broad cross-section of asset-intensive subsectors globally, including mining, oil and gas, utilities, public sector, transportation, and manufacturing.

IBM offers its Maximo Application Suite (MAS) (recent version of V8.5), which includes Manage (Core EAM), Health, Monitor, Visual Inspection, Safety and Mobile. Maximo provides support for linear assets and calibration, and offers several named industry extensions, in addition to the full set of core EAM functionality. IBM provides a Maximo SaaS offering (single tenant), built on top of IBM Cloud infrastructure (and deployable on Amazon Web Services (AWS) and Microsoft Azure third-party clouds). Cognos Analytics provides analytics and extended reporting. Maximo Mobile provides mobile capabilities for Maximo, although more than a dozen third-party alternatives are available. Third-party integration is needed to support shutdown planning requirements.

A number of changes occurred in 2021 to include the addition of "Manage" into its IBM Maximo single integrated suite of products. IBM continues to pivot its licensing model from named to concurrent users under a term or perpetual license. Functionality changes in Manage include a new asset drill-down interface and asset cost rollup analysis. Technical improvements include GraphQL interface data exploration options, containerized applications managed with Red Hat OpenShift, full JSON support for data import and export and publishing, Migration Manager API to automate promoting changes between environments, and enhanced support for e-signature and SQL Server sequencing. Also made available were new role-based applications for supply chain functions, new graphical applications for scheduling and assigning technicians, updates to the Scheduling Optimization engine, a data cleansing tool, a new Maximo Mobile application, and a partnership with Partium to provide access to an integrated parts catalog. Maximo fully supports 21 CFRPart 11 and ISO 55000, and there is an extensive ecosystem of third-party system integrators and resellers.

IBM declined to report the number of new EAM customers since January 2021 and has noted the following publicly shareable EAM customers: Bruce Power, Brookhaven National Laboratory, Hub Power (Hubco), MARTA, New York Power Authority, and Petroleum Development Oman.

Prebuilt Third-Party Interfaces

ERP: SAP (S4/HANA (excluding public cloud) & R/3) and Oracle e-business Suite (EBS)

GIS: Esri

APM: AVEVA, Bentley Systems, GE Digital and HBM Prenscia

AIP: None Reported

System Integrators: Accenture, Aquitas Solutions, Cohesive Solutions, EXA, Ontracks Consulting, Strategic Maintenance Solutions (SMS)

IFS

IFS is a private global enterprise application software vendor with headquarters in Linkoping, Sweden. The company's portfolio includes solutions to support ERP, FSM and EAM, each of which can be provided as a suite, a stand-alone solution on-premises or a hosted service. EAM represents about half of its total business. Small, midsize and large enterprises are all targets for IFS' EAM-focused solutions.

All core EAM functionalities are covered by IFS Cloud EAM, including support for linear assets and fleet management. IFS offers mobile extensions (IFS MWO Service) for Android and iOS that include support for offline capabilities. Recent enhancements to IFS Cloud EAM include equipment data collection with IFS IoT Business Connector for Asset Monitoring. The company launched the Dynamic Work Planning & Scheduling tool to automate the creation of the proposed work plan, enhanced UX with navigational lobbies, and leveraged the new HTML5 tools to make a more flexible and configurable end-user experience. The solution is available in a wide range of asset-intensive industries globally, particularly targeting energy and utilities, nuclear, manufacturing, aerospace, transportation and defense. IFS EAM fully supports client endeavors for 21 CFR Part 11 and ISO 55000 compliance.

IFS has significantly grown cloud-based deployments over the last year, which now account for more than half of its EAM customer base. IFS has endeavored to overcome its limited number of partners by increasing the number of third-party resellers and system integrators, which resulted in a four-fold increase in partner-sourced revenue in the last two years. In late 2020, IFS acquired Clevest to add functional capability in mobile workforce, as well as increase its reach in North America.

IFS reports 50 new EAM customers since January 2021. IFS has noted the following publicly shareable EAM customers: Globeleq, LKAB, SBM Offshore, SDIC Qinzhou Electric Power, U.S. Navy.

Prebuilt Third-Party Interfaces

ERP: Oracle, SAP

GIS: Esri

APM: None Reported

AIP: None Reported

System Integrators: Accenture, BearingPoint, DXC Technology, RutterKey Solutions, Tech Mahindra

IPS

IPS (Intelligent Process Solutions) is a privately held software company headquartered in Germany. The IPS EAM product is focused on all utility sectors (primarily generation, transmission and distribution), with limited clients elsewhere. Most clients are in North America and Europe, with the product being offered in 10 languages. Midsize and large enterprises make up the largest portion of EAM customers.

The asset management module is available in a platform called IPS-LUNA, which is integrated with other IPS solutions (APM, AIP, outage management, network model management, protection setting management and others). Within IPS-LUNA, there are libraries of predefined asset types with default settings, configurations and templates for analytics, dashboards, maintenance activities, notifications and reports.

The core functionalities offered include asset management, maintenance concepts, planning, work ordering, work execution, maintenance analysis and MWM, with mobile access to technical documentation and a geolocation interface. Linear assets and fleet management are also supported, and APM capabilities are available as an integrated product (RCM, predictive analytics, CbM, risk management). Recent enhancements include integration with new models, including: scheduling, AIP, inventory and materials, and a redesigned UX. For the power industry, IPS offers a combination of EAM, analytics and outage management, with more focus on power engineering needs than other offerings. The product supports ISO 55000:2014 and PAS 55 standards, as well as other standards specific to the power industry (e.g., IEC61970 CIM XML Network Model). The mobile subsystem IPS-MobApp offers data collection based on visual recognition and an offline mode of use.

IPS reports seven new EAM customers since January 2021. IPS has noted the following publicly shareable EAM customers: AEP, Entergy, SEC, Scottish and Southern Electricity Networks (SSEN) and Svenska kraftnät.

Prebuilt Third-Party Interfaces

ERP: Oracle, SAP

GIS: Esri, Hexagon, Small World

APM: None Reported

AIP: None Reported

System Integrators: Accenture, Atos, Enzen, Hatch, Siemens, Wipro

Oracle

Oracle is a publicly held global technology company with headquarters in Texas in the U.S. Oracle has many products that include EAM capability; the ones assessed here are Oracle Fusion Cloud Maintenance, Oracle's Utilities Work and Asset Management (WAM) and the related Utilities Work and Asset Cloud Service (WACS).

Oracle Fusion Cloud Maintenance

Fusion Cloud Maintenance supports the full set of core EAM functionality needed for most asset-intensive industries' maintenance requirements. Built on a cloud platform, Oracle Fusion Cloud Maintenance leverages IoT, AI, and machine learning (ML) technologies to optimize asset maintenance strategies and operations. The product manages physical assets to achieve end-to-end visibility of maintenance operations through integration with the supply chain. This includes: materials management, procurement, quality, projects, planning, scheduling, fixed assets, financials, and costing, along with embedded analytics. Its main target markets are natural resources, manufacturing, transportation/fleet, utilities, and engineering and construction.

EAM is offered as part of Oracle Supply Chain Management as a subscription-based SaaS/cloud-integrated ERP offering, with quarterly updates. Oracle has no specific support for CFR21 Part 11. Recent product enhancements include connecting operational assets to fixed assets, improved access to Oracle Supply Chain Management, and managing assets using logical hierarchy relationships. Additional enhancements include project-driven supply chain, including maintenance, enhanced replenishment planning and improved work order capabilities. Oracle Fusion Cloud Maintenance leverages Oracle Transactional Business Intelligence (OTBI) and BI Publisher for reporting. Planned for the future are a supplier warranty solution, support for failure analysis and support for Oracle Fusion Analytics Warehouse (FAW). Interfaces to third-party mobile tools include DSI, Intellinum, Prometheus, RF-Smart and Ventureforth.

Oracle declined to report any new Fusion Cloud Maintenance EAM customers since January 2021. Oracle has declined to provide any publicly shareable Fusion Cloud Maintenance EAM customers.

Prebuilt Third-Party Interfaces

ERP: Oracle Cloud ERP/HR

GIS: Esri

APM: None Reported

AIP: None Reported

System Integrators: Accenture, Deloitte, EAM Masters, Evosys, PwC

Oracle WAM/WACS

Oracle's Utilities Cloud Global Business Unit is based in Austin, Texas. Its main target markets are utilities and city governments.

Oracle Utilities has a cloud-first approach for WAM, and in June 2019, started using the term Work and Asset Cloud Service (WACS), meaning that customers in the cloud version will see functionality before on-premises customers. The company claims 75% of new WAM/WACS EAM customers are on cloud deployments of WACS. WAM/WACS supports the full set of core EAM functionality needed for utilities, including linear assets and fleet management. WAM/WACS also provides Utilities Operational Device Management (ODM/ODCS), a product to manage the maintenance of intelligent OT devices in the field — including smart meters — via WAM/WACS. The product also offers a compliance tracking capability to allow maintenance monitoring and repair, and tracking for warranty terms, regulations and SLA standards. WAM supports APM and basic RCM functionality, as well as predictive analytics and CbM. Oracle WAM/WACS can operate in a browser, tablet or with mobile functionality, and is supported by a separate product, Oracle Field Service (OFS), on Windows, iOS and Android. The product does support ISO 55000:2014 standards.

The product offers a connector tool for integration with any vendor's ERP. But Oracle is building ready-to-use integration with Oracle Cloud ERP, with the procurement and supply chain integration planned for release in 2021. The native integration with Primavera allows for project and capital asset planning to be done more easily. OFS integration provides for prebuilt integration for end-to-end flow from work planning, scheduling and execution to closeout. The integration with grid operations software will allow a closer alignment between the OT elements of the grid and the IT systems provided by Oracle WAM/WACS. Recent product enhancements include capabilities for analytics visualization in work management, resource management and inventory management, a new functional process portal, a change request portal, and bulk time sheet creation.

Oracle declined to report any new EAM customers since January 2021. Oracle has declined to provide any publicly shareable EAM customers.

Prebuilt Third-Party Interfaces

ERP: Oracle

GIS: Esri

APM: None Reported

AIP: None Reported

System Integrators: Accenture, Abjayon, Capgemini, Deloitte, EY, Infosys, Oracle Consultant Services (OCS)

SAP

SAP is a publicly held global enterprise application software vendor based in Walldorf, Germany. SAP offers a comprehensive horizontal business application suite designed for a cross-section of industries, with industry cloud for tailoring solutions. Its EAM offering is used by a broad spectrum of mostly large asset-intensive organizations. Its EAM customers are in every major region of the world, and over 30 languages are supported. EAM is considered to be part of SAP's digital supply chain solutions.

SAP is transitioning its customer base from R/3 and ECC 6.0 to S/4HANA, which is available as on-premises, private cloud or public cloud (multitenant, called "essentials," or single tenant, called "extended"). SAP pursues a cloud-first policy, so quarterly cloud-based EAM enhancements are consolidated annually for the on-premises version. EAM is still available to existing ECC 6.0 customers. Net new customers must opt for the S/4HANA product, which has a different codebase. Both products support broad, core EAM functionality, as well as extended functionality such as calibration, linear assets and compatible units.

Mobile functionality is supported via the SAP Work Manager product (on-premises or cloud) and SAP Asset Manager, jointly developed with Google and Apple (on Android and native iOS). Scheduling is supported by the Multi Resource Scheduling (MRS) ERP extension and embedded S/4HANA Resource Scheduling (both available as on-premises and cloud), and SAP offers field scheduling in SAP Field Service Management (cloud). The Enterprise Portfolio and Project Management (EPPM) module supports projects and turnarounds to a great extent. SAP acquired Fieldglass, which brought with it a cloud-based contingent workforce management solution suited to outsourced maintenance management.

SAP EAM is preintegrated to the SAP suite of enterprise applications, including financials, procurement and HR, and should be considered by organizations already invested in SAP ERP systems. Not all SAP ERP customers use the EAM solution, but all SAP EAM customers have the ERP suite in place. SAP has a mature and extensive global community of EAM support resources and partners. This includes many alternative options for mobile workforce enablement, as well as a software development kit (SDK) for partners and customers to develop their own configurations of the mobile applications. The product is highly scalable and suitable for large and midsize enterprises across the full spectrum of asset-intensive industries, and supports both 21 CFR Part 11 and ISO 55000:2014.

Recent product enhancements include: UI updates developed in SAP Fiori of new applications and functionalities targeted at maintenance planners, schedulers and technicians; risk and criticality matrix; maintenance backlog; new one-stop, single-entry screen (SAP Fiori app); and Intelligent Scenario for Damage Code and Object Part Prediction. In addition to developments like SAP IoT integration and Asset Intelligence Network capability, which is useful for Industrie 4.0 and similar digital manufacturing initiatives, SAP Intelligent Asset Management suite is a major investment that provides integrated APM solutions to existing and new ERP customers. This includes SAP Predictive Asset Insights (PAI) and SAP Asset Strategy and Performance Management (ASPM).

SAP declined to report any new EAM customers since January 2021. SAP has declined to provide any publicly shareable EAM customers.

Prebuilt Third-Party Interfaces

ERP: SAP

GIS: Esri

APM: SAP Intelligent Asset Management Suite

AIP: SAP Enterprise Portfolio and Project Management SuiteSystem Integrators: Accenture, Atos, Capgemini, Deloitte, DXC Oxygen, Havensight, HCL Technologies, Infosys, Rizing, plus others

Ultimo

Ultimo Software Solutions is a privately held pure-play asset management software provider headquartered in the Netherlands, with offices in the U.K., Germany and Belgium. Most clients are in Western Europe, with a smaller presence in North America, Latin America, Eastern Europe, the Middle East, Africa, India, Japan and China. The product is offered in eight languages. The majority of EAM customer deployments are in small and midtier organizations in government, logistics, manufacturing, mining, transport, oil and gas, and utilities.

Ultimo Enterprise Asset Management is a cloud platform built on Microsoft Azure. The product provides all core EAM functionalities: planning and scheduling, work management, asset management, inventory management, and purchasing and receiving. In addition, industry extensions are available for technical, medical, infrastructure, fleet management, and calibration and linear asset management (via the infrastructure extension). Third-party integration is required for CbM and predictive maintenance. The product supports 21 CFR Part 11 and ISO 55000:2014 standards.

Recent enhancements include: native mobile app rebuilt to Microsoft Xamarin, including improved usability, and support for working offline; redesigned asset availability (downtime registration and analytics); acceptance/signoff of maintenance work orders by the production department (food safety standards); improved recording and reporting preventive maintenance schedule compliance; extension integrations for track and trace, based on a partnership with Philips; fleet management; enhancements regarding asset availability and invoicing, improved UI for sending emails from Ultimo; improved graphical stop planner (shutdown planning module); and integrated BI dashboards. AIP is provided by Ultimo Long-Term Asset Planning.

In September 2021, Ultimo announced an agreement with AVEVA as a strategic partner and to support integration with AVEVA Insight APM.

Ultimo reports 139 new EAM customers since January 2021. Ultimo has noted the following publicly shareable EAM customers: Agristo, bp (Castrol), BEWiSynbra Group, DSM, Freiberger, London Gatwick Airport, Ravago, Recticel Insulation, SGD Pharma, Vion Food Group, VTTI

Prebuilt Third-Party Interfaces

ERP: Infor, Microsoft Dynamics 365, Oracle, SAP

GIS: Esri

APM: AVEVA, Axians MAESTRO, UReason APM Studio

AIP: None Reported

System Integrators: DNASTREAM, MaxGrip, Optimal, Pontifexx, Talenco and Vibber

UpKeep

UpKeep is a privately held pure-play asset management software provider headquartered in California in the U.S. UpKeep has stated that the vast majority of its clients are in North America, with a smaller presence in Western Europe, the Middle East and Australia/NZ. The product is offered in two languages (English and Spanish). The majority of claimed customer deployments are in smaller organizations in manufacturing, equipment services and transport industries.

UpKeep product provides all core EAM functionalities: planning & scheduling, work management, asset management, inventory management, purchasing and receiving. In addition CbM and predictive maintenance are provided by UpKeep Edge and Reliability Centered Maintenance by UpKeep Analytics. Common integrations for subcontractor management and shutdown planning are with SAP. The product supports ISO 55000:2014 standards. Recent enhancements include: platform enhancements for enterprise scalability and integration; advanced analytic capability, dashboards and reporting; enhancements in UpKeep Edge gateway for IOT data integration; and support for asset metering, reporting, and proactive maintenance.

UpKeep reports 899 new customers since January 2021. The company has noted the following publicly shareable customers: Constellation Brands, McCormick, NATGAS, Orangetheory, Rehrig Pacific

Prebuilt Third-Party Interfaces

ERP: SAP

GIS: None Reported

APM: None Reported

AIP: None Reported

System Integrators: BXAP, SEAM Group, Votum Technology Group

Market Recommendations

Organizations evaluating EAM products should understand that while EAMs can be adapted to different organizational objectives and use cases, selecting the best EAM vendor for your needs is an important decision. In asset-intensive industries, the EAM is a critical success factor for managing a company's physical infrastructure. These systems are complex software products that are extremely data-intensive. Implementations can take months to years or longer, depending on requirement complexity. Vendor choices are not easily reversed.

Although a comprehensive EAM solution would deliver value for any asset-intensive organization,

the priority of functional components will vary by industry. The value should be weighed against the investment and total cost of ownership. More specifically, when evaluating EAM options, consider:

- Does the vendor have experience in your industry?
- Does the vendor have a presence in your geography?
- Are you wedded to a cloud or on-premises deployment?

Assess your data quality and, if there are deficiencies, invest in strengthening your existing EAM system to enforce data quality rules and/or initiate an asset data cleansing project with a focus on implementing an appropriate form of master data governance.

To best manage the EAM integration, CIOs should:

- Plan EAM project deployments to include close integration with other systems from the outset (including ERP, APM, AIP, data historians, field mobility and GIS).
- Evaluate vendors on their capability to support standard APIs to leading ERP and APM solutions or, in case of OT integration, also to IIoT platforms (or even an IoT platform-agnostic approach).
- Ensure there is an interface importing APM recommendations directly into the EAM system.

- If contemplating usage-based preventive maintenance or CbM, plan access to sufficient, secure, sustainable, relevant and curated IoT and 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 a CbM/EAM project.
- Look at the basics of equipment and component data quality, as these will be the foundation of your EAM dataset (see Quick Answer: Improve Performance and Reduce Risk by Addressing Asset Data Quality)

Confirm the alignment between the vendor's EAM product roadmap and your own long-term equipment

reliability strategy (assuming you have one).

Not all EAM 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 determine if your EAM vendor also has an APM offering and assess its support of specific classes of assets. If this is lacking, then an APM specialist vendor may be more suitable.

Evidence

Gartner received vendor briefings and associated material from 20 EAM vendors (most have global reach, but some are only regional) from February through August 2021. Gartner also surveyed secondary research sources for information on market trends and vendor activity.

Gartner analysts acquired insights from several hundred asset-intensive organizations for selecting an EAM or CMMS system through the Gartner inquiry process, one-on-one meetings at events and customer reviews on Gartner's Peer Insights page. These provided directional support for opinions derived from earlier data.

[1] Market Opportunity Map: Enterprise Business Applications, Worldwide

[2] Hexagon Completes the Acquisition of Infor's EAM Business and Has Resolved on an Issue in Kind, PR Newswire.

[3] Rockwell Automation Completes the Acquisition of Fiix Inc., Cloud Software Company for Leading Edge Maintenance Solutions, Yahoo.

Note 1:
Representative Vendor Selection

For this Market Guide, we evaluated the most prominent EAM products for large-scale, asset-intensive industries worldwide, based on industry relevance, client interest and customer base. Software products must address most functional capabilities listed in Note 3. They should have a demonstrable track record in asset-intensive organizations, and they should cover multiple geographies and industries. Several EAM and CMMS products in the market were not considered as they did not sufficiently target asset-intensive industries (e.g., they targeted buildings or infrastructure).

There are many other vendors in this category that were not evaluated or included, either because of the inclusion criteria or the information available at the time of the vendor survey and assessment.

Note 2: EAM Product Functionality

EAM products provide process support for maintenance of:

- Fixed-plant assets such as power generation, manufacturing and oil refineries
- Linear assets such as power lines, rail and pipelines
- Mobile and fixed-fleet assets such as service equipment, rail cars, locomotives, trucks, transformers, pumping stations and wind generation

An EAM solution includes functionality for:

- Equipment and component definition
- Managing, planning and scheduling work
- Work order creation (via manual creation, time- and usage-based calculations, or condition-based calculations)
- Maintenance history and cost tracking
- MRO (replacement parts) inventory, procurement and invoice matching
- Equipment, component and asset tracking for assemblies of equipment

In some instances, the functionality is extended by the addition of basic financial management modules such as accounts payable, cost recording in ledgers and HR functions such as a maintenance skills database.

The functionality provided must be capable of managing:

- Hierarchical plant structures
- Reactive and preventive maintenance
- Outage/shutdown planning for refurbishments and turnarounds
- “Fleet” maintenance capability, not just for vehicles, but also for fleets of assets such as oil fields or wind farms

Table 2 describes the EAM product requirements listed in priority order, most of which will be satisfied by the best-in-class software products in this category. These are typically used in determining the functional critical capabilities as described in Note 3 that clients assess when evaluating EAM alternatives.

Table 2: EAM Functional Product Requirements

(Enlarged table in Appendix)

Functional Requirements	Use Cases
Asset System of Record	■ Detailed physical asset registry, combined with internal and external parts and support descriptions (core EAM) and the ability to define and maintain hierarchical and list-based asset and component structures. (These will be frequently integrated with other specialized asset data representation like digital twins, product life cycle management [PLM] and GIS.) ■ An internal catalog of replacement parts linked to assets and components that is used for managing single-location and multilocation inventory records of spare parts ■ Serial number tracking and tracing for replacement parts and installation history ■ Statistical analysis of equipment performance and reliability — Standard reports and analytics for management oversight of operations, as well as the ability to develop custom reports ■ Financial support via detailed cost analysis related to AIP (see Optimize Utility Capital Expenditures With Asset Investment Planning Solutions) ■ Warranty tracking to component level and support for manufacturers' records requirements for equipment under warranty ■ Linear asset management — Defining and maintaining linear structures (pipes, wires, rail, roads) within the EAM systems in a dynamic and flexible way, including offsets and intersects and integration with GIS (see 3 Practices Utility Company CIOs Should Include in an Integrated EAM-GIS Solution Strategy)
Scheduling and Execution	■ Unplanned job reporting/requesting — Capability for end users to report faults or failures and have them acted on as part of a job plan ■ Preventive maintenance (time-based or usage-based) — Creating recurring maintenance jobs based on a schedule ■ Long-term maintenance, project and work schedules (core EAM), including assigning tasks to resources for job completion over a period of time ■ Resource planning capabilities to match skills, training and availability with work requirements ■ Shutdown/turnaround project planning ■ Capital construction planning (for utilities, this is known as compatible unit estimating) ■ Condition-based triggers and alerts creating work orders ■ Lockout/tagout or "permit to work" functions ■ Handheld device support for both connected and disconnected applications enabling mobile workers (see Market Guide for Mobile Workforce Management Software for Utilities) ■ Inclusion of fleet maintenance support functionality for vehicles and other fleet assets by defining and managing a replicated set of repeated assets to manage the data collectively and individually
Parts Planning	■ Support for complex (alternative manufacturers and alternative suppliers) inventory relationships for indirect MRO ■ Supply chain capability for indirect goods, with demand planning linked to maintenance and repair schedules (core EAM), enabling requesting parts and materials for both stocked and nonstocked items; capability of procurement management and supplier management. ■ Probability-based, "just in case" MRO-focused inventory and procurement, rather than "just in time" or material requirements planning (MRP)-based inventory ■ Flexible, supported integration with ERP and financial packages

Source: Gartner (December 2021)

Note 3: EAM Product Functionality Critical Capabilities and Definitions

- **Work Management:** Presentation of planned or required work over a period of time, and prioritizing jobs and tasks needed for completion.
- **Work Scheduling:** Laying out the planned and required work in a time-based schedule, recognizing constraints that apply such as outages. This can use resource pools as opposed to a named resource.
- **Work Assignment:** Assigning tasks to resources for job completion over a period of time.
- **Asset Management:** Being able to define and maintain hierarchical and list-based asset and component structures.
- **Inventory (Materials) Management:** An internal catalog of replacement parts linked to assets and components and used for managing single and multilocation inventory records of spare parts.
- **Material Requisition/Procurement:** Requesting parts and materials for both stocked and nonstocked items. Capability of procurement management and supplier management.
- **Mobility:** Field service and mobile workforce support.
- **Analytics and Reporting:** Standard reports and analytics for management oversight of operations, as well as the ability to develop custom reports.
- **Linear Asset Management:** Defining and maintaining linear structures (pipes, wires, rail, roads) within the EAM system(s) in a dynamic and flexible way, including offsets and intersects.
- **Fleet Management:** Defining and managing a replicated set of repeated assets to manage the data collectively and individually.
- **Unplanned Job Reporting/Requesting:** The capability for end users to report faults or failures and have them acted on as part of a required work schedule.
- **Preventive Maintenance (Time-Based):** Creating recurring maintenance jobs based on a time schedule.
- **Preventive Maintenance (Usage-Based):** Creating recurring maintenance jobs based on the usage data from equipment such as hours, kilometers and flow.

- **Condition-Based Maintenance (CbM):** Creating maintenance jobs based on a condition trigger from equipment such as temperature or vibration.
- **Workforce/Skills Management:** The capability of tracking workforce availability, qualifications and skills for assignment to specific jobs.
- **Subcontractor Management:** The capability of tracking, hiring and paying subcontractor services.
- **Component Tracking and Tracing:** The capability of identifying serialized components, their fitment history and prior usage.
- **Shutdown Planning:** The capability of doing project planning for fixed-asset shutdowns and plant turnarounds, and mapping multiple jobs and resources over a fixed time period.
- **Asset Tracking:** The ability to locate and track the movements of assets and equipment.

Document Revision History

Market Guide for Enterprise Asset Management Software - 22 December 2020

Recommended by the Authors

Some documents may not be available as part of your current Gartner subscription.

Market Guide for Asset Performance Management Software

Market Guide for Geospatial Information Systems for Energy and Utilities

Quick Answer: The Difference Between Enterprise Asset Management and Field Service Management

Mapping a Route to Asset Management and Reliability

Magic Quadrant for Cloud ERP for Product-Centric Enterprises

The CIO's Role in Supporting Industrial Assets

Eight-Step Playbook to Optimize Software and SaaS Negotiations

Table 1: Representative Vendors in Enterprise Asset Management Software

Vendor	Product Name
Accruent	Maintenance Connection
Aptean	EAM TabWare Edition EAM API Pro Edition EAM
AVEVA	AVEVA Enterprise Asset Management (discontinued sales as of 31 December 2021)
CGI	CGI OpenGrid360
Dude Solutions	Dude Solutions EAM Suite
Eagle Technology	Proteus MMX
eMaint	eMaint CMMS
Fiix	Fiix CMMS
Hexagon (Infor EAM)	Infor EAM
Hitachi Energy	Asset Suite EAM Ellipse EAM Digital Enterprise
IBM	IBM Maximo Asset Management Maximo Application Suite (MAS)
IFS	IFS Enterprise Asset Management Cloud

IPS	IPS ENERGY
Oracle	Oracle Utilities Work and Asset Management (WAM) Oracle Utilities Work and Asset Cloud Service (WACS) Oracle Fusion Cloud Maintenance
SAP	S/4HANA ECC 6.0S/4HANA Cloud (public cloud)
Ultimo Software Solutions	Ultimo Enterprise Asset Management
UpKeep	UpKeep EAM

Source: Gartner (December 2021)

Table 2: EAM Functional Product Requirements

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	Practices Utility Company CIOs Should Include in an Integrated EAM-GIS Solution Strategy)
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Source: Gartner (December 2021)