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New technologies are re-energizing enterprise asset management.

Enterprise asset management (EAM) is hardly a new concept. Software solutions have been in play for over two decades with most tools offering similar core functionality. For solution providers, selling better architected, more user-friendly EAM tools to their existing customer bases has become the primary growth driver. Datastream, for example, reports that over 40% of its new installations are with existing customers upgrading their legacy client server solution to a Web-enabled one. Recently, emerging technologies also have been generating a renewed interest in the space. Consider technologies such as:

RFID and GPS that enable mobile asset tracking. An active radio frequency identification (RFID) tag can store and transmit asset information up to 30 feet away. Global positioning system (GPS) antennae and satellites can report location details anywhere in the world.Mobile assets can include anything from a fleet of trucks, trailers and containers to a hospital's movable medical devices. The tracking of these assets continues to attract a good deal of market attention as security issues remain on the forefront of every firm's agenda.

For example, a company like JR Freight, a Japanese railway transportation company, can pinpoint the exact location of a shipping container among the thousands in its yard by mounting a GPS antenna and RFID reader to the forklift, reading the tag details when the container is stacked, linking it to the GPS coordinates received on the forklift and sending it to the master tracking software. This not only reduces the time it takes to locate an asset, it also improves overall visibility throughout the supply chain.

GIS that makes it possible to view asset details geographically. Geographic information system (GIS) tools use location data to display assets on a computerized map. From the asset icon on the map, users typically can drill down to more information, such as open work orders and maintenance history, in a tabular format. This functionality is especially useful for utilities field service workers.

For example, using GIS technology, utility workers with Southern Company, one of the largest utility companies in the U.S., can answer questions in the field like,"Are there other open work orders within a two-mile radius of a utility?"Or,"What is the quickest driving route to my next work order?"This streamlines field service jobs and puts crucial information at the workers' fingertips- thus, making them more efficient.

Rugged, wireless PCs and handheld devices that allow automated data entry. This technology continues to emerge in support of the distributed and disconnected workforce.EAM field workers stand to benefit from such technologies by being able to automate much of the manual data entry that is currently required of them when they are completing a work request. Within a facility, parts management clerks can significantly improve inventory accuracy by using handheld bar code scanners instead of dealing with the data manually.

For example, Pratt & Whitney has implemented a wireless bar code based data collection system using Intermec's mobile computers with integrated bar code scanners, significantly improving parts inventory data accuracy and streamlining the receiving process into the warehouse.

Seeking to meet evolving needs

The EAM solution market is highly fragmented with literally hundreds of niche vendors. Bestof- breed vendors like MRO Software, Datastream and Indus offer stand-alone solutions with outof- the-box ERP integration points. ERP suites like SAP, Industrial Financial Systems (IFS), Intentia, and Oracle all have EAM solutions within their larger ERP offerings.

As firms move to reduce the number of vendors they have to work with and standardize their technology stacks, many are looking to their existing ERP solutions to provide the needed EAM functions.

ERP vendors that do not have an EAM tool are working to fill that functional gap. A recent example of this was the March 2006 acquisition of best-of-breed EAM provider Datastream by ERP vendor Infor.

Reactive cultures hinder wide adoption

Based on Forrester's interviews, we found that many companies are still struggling with dayto- day reactive issues. Because of this firefighting state, they are not able to make program improvements and move to a predictive strategy in maintaining their assets.

The three most commonly reported issues are:

1. Bad data and low user adoption of EAM applications. EAM users have reported that inaccurate and incomplete data is the most persistent problem they face. This is resulting in a lack of faith in the system and low adoption rates, compounding the issue even more. Some companies attribute problems to their existing processes or the lack of a dedicated owner/administrator of the data. Others point to their systems' poor usability and tedious data entry requirements.

2.Poor inventory management of service parts. To keep operations up and running and avoid disruptive events like a plant shutdown, many maintenance managers opt to hedge in their requirements for parts safety stocks. Additionally, many facilities have yet to adopt robust management processes, such as bar code-enabled receipt, stocking and picking. This means that their EAM tools cannot rely on an accurate picture of what parts are really available.As a result, many firms are incurring higher inventory carrying costs with excess on hand.

3. The inability to create proper work schedules. Users also reported that allocating their ever shrinking labor pool between reactive, scheduled and preventive maintenance is one of their biggest challenges. The simple question of what work to do at the right time is still unanswered.When an organization operates in a reactive state, it becomes extremely difficult to plan for predictive maintenance. On the other hand, some companies opt to over-maintain their assets, to avoid machine failure or plant shutdown. Over time, this practice is often as expensive as the cost of recovering from that same disruptive event.

Focusing on adoption challenges

To address these challenges, EAM solution providers have worked with their customers to enhance functionality, offering incremental improvements over legacy tools. Specifically, they have:

Automated data entry and refined validation rules to address integrity issues. Bestof-breed applications now can run on mobile devices like Symbol's rugged MC70 or MC9000 Series handheld computers and barcode scanners. This allows workers to complete work order details in the field or reference key asset information when making a repair. Barcode-enabled scanners are used to quickly identify an asset and bring up the relevant work order. This helps eliminate the need for a clipboard and avoids manual entry,

which, in turn, improves the quality of the input needed by the EAM solution. Additionally, solution providers have embedded data-cleansing and validation utilities in an effort to address data errors. IFS, for example, has built-in validation rules where imported or manually entered records are checked for possible errors and duplicates. If the record violates any business rules, the tool alerts the user of the potential problem and does not update the production data until it is resolved.

Applied supply chain best practices to improve spare parts inventory management. To build efficiency gains by having the right part on hand for the needed maintenance, EAM providers now offer many inventory management features such as eCommerce cataloging and purchasing, inventory tolerance levels that trigger auto-requisitions and bar code label generation for receipt and cycle counting.

MRO Software's Maximo Enterprise Suite solution, for example, has a built-in procurement module that offers automated materials requisitions based on maintenance schedules to ensure that the right parts are ordered at the right time. Providers also work with their clients to implement other inventory management best practices, including setting up the standard parts taxonomy and naming conventions along with the use of numbered inventory racks.

Added business logic to facilitate optimal maintenance scheduling. To help users build maintenance work plans based on factual assessment of priorities, EAM solution providers also have focused on offering easy-to-use scheduling functionality like a graphical calendar display or integration to thirdparty scheduling tools. Datastream 7i, for example, includes a built-in Microsoft Project interface that enables the planning of the schedule in Project using labor and task data from the EAM solution-without having to manually export and import the data each time. To prioritize tasks, solutions rely on past asset performance information to simulate a failure point. Based on this simulation, the tool then can recommend the timing of the maintenance, using the overall asset criticality and resource availability.

Moving upstream to achieve PdM

Although EAM solutions have seen progress in areas like usability and data validation, they still fall short of helping clients optimize their asset utilization.

To accomplish this, firms need tools to help them not only react to actual failure points, but

to predict future failure points, as well as proactively recommend remediation.

This can be achieved by establishing a greater interoperability between asset monitoring/diagnostics solutions and EAM tools. To understand the total costs and ramifications of a scheduling decision, planners need access to a consolidated view of EAM data that includes labor, parts and downtime cost, in conjunction with asset monitoring trends and predictions- all in one application.

The integration of these systems not only offers advance identification of a required work order, it also manages the creation and scheduling of that order based on all the information available in EAM, such as previously completed maintenance and other task priorities.

RCM. . .the first step in EAM transformation

Facing new business requirements, such as higher service-level agreements or further decentralization of their operations, firms are looking to revamp their asset management practices. As with all process re-engineering efforts, the first challenge is to gain an accurate understanding of the strengths and weaknesses of current practices. This is especially important for companies that have grown through acquisition, inheriting new facilities and operations with different processes and systems. Practices that assumed a highly centralized organization might now be unsuitable to a distributed, loosely coupled operation.Without gauging the effectiveness of the"as-is"state, companies lack the foundation to define and detail the roadmap to the desired"to-be"state.

The challenge is that benchmarking efforts are often overwhelming to firms with already stretched maintenance budgets and limited personnel bandwidth. The good news is that there are a number of well-defined methodologies and tools to help teams streamline the process-*namely Reliability Centered Maintenance (RCM) assessment methodology*-to provide an excellent framework for the first steps in process re-engineering efforts. RCM helps define key performance metrics for the asset under review, as well as the reasons, likelihood and impact of possible failures. RCM also can help map out the preventive tasks that can minimize the likelihood of each failure.

RCM assessments, however, are beneficial to asset management transformation only if companies translate the findings into actionoriented recommendations and work orders within the EAM system. Specifically, they must use insights from RCM assessments to gauge the effectiveness of current maintenance practices and ensure that the new processes set

up in the EAM system will only improve their overall return on assets. If old EAM data is simply exported into a new system without this assessment, all of the inaccurate and improperly prioritized tasks come with it. In the newly engineered process, the organization must allocate resources proportionate to the cost and yield of each maintenance task. By completing this exercise, a company is a step closer to ensuring that the right tasks are performed at the right time.

Companies should take the opportunity before system upgrades or new installs to conduct a complete RCM assessment and use the results to drive the new system requirements. Once the system is live in production, it becomes exponentially more difficult to make changes from both a process and application perspective. Many RCM assessments fall short today because the recommendations for making improvements are not translated into action-oriented tasks within the production system. However, if this analysis is completed on the front end of the implementation cycle, as a precursor to setting up an EAM system, the odds of success are increased significantly. **MT**

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