ERP FOR ASSET-INTENSIVE INDUSTRIES: HOW INTEGRATED EAM AND PROJECT MANAGEMENT DRIVES VALUE

KEY QUESTIONS:

P3

Do you have a cohesive solution that can bring together project management, EAM, and ERP under one integrated software suite?

P4

Can your asset record and hierarchy be tapped for everything from procurement, to projects, to HR records that track who is certified to run or maintain specific assets?

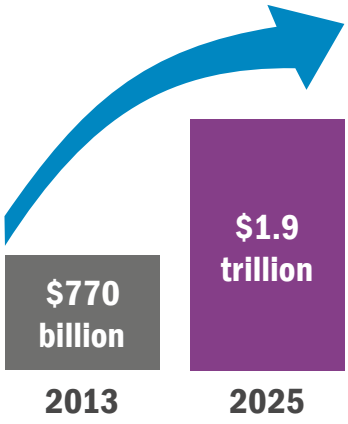
P6

Is your master data for ALM and maintenance good enough to comply with regulatory compliance and adhere to safety standards, present and future?

IFS WHITE PAPER

ERP FOR ASSET-INTENSIVE INDUSTRIES: HOW INTEGRATED EAM AND PROJECT MANAGEMENT DRIVES VALUE

While asset-intensive industries can be cyclical and dependent on raw materials costs or energy prices, over the long term, the expanding global economy makes more investment in plant and equipment assets inevitable. According to research from PwC[1], global capital project and infrastructure (CP&I) spending will exceed $9 trillion by 2025, up from $4 trillion in 2012, while in asset-intensive manufacturing sectors including petroleum refining, chemicals, and heavy metals, CP&I is expected to grow from $770 billion in 2013 to $1.9 trillion in 2025.



The reality is that asset-intensive industries will continue to invest in complex plant and equipment assets to meet the needs of the global economy, especially high growth regions such as Asia Pacific. Those asset-intensive companies that excel at asset lifecycle management (ALM) and cost-effective asset operations and maintenance will have a competitive advantage. Enterprise software capable of supporting operations & maintenance, and not just financials, should be seen as part of the foundation for success in asset-intensive sectors.

The scope of the challenge goes well beyond tactical monitoring of equipment health to larger lifecycle issues, such as accurate master data over assets and plant designs, how effectively asset-intensive companies collaborate with engineering, procurement & construction (EPC) firms, how disciplined they are at project control, and how well they do things like rationalize spare parts across sites. And because asset-intensive industries carry many environmental, health and safety impacts, they tend to be heavily regulated and must pay close attention to compliance.

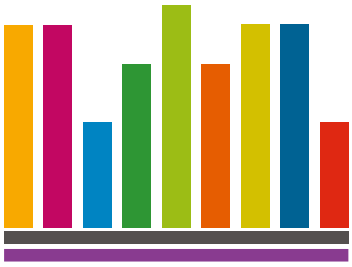
LIFECYCLE CHALLENGES:

- Accurate master data on assets & designs
- Effective collaboration with EPC firms
- Disciplined project control
- Streamline spare parts across sites
- Compliance with standards and regulations

These industry challenges drive particular needs when it comes to enterprise software. Because of the importance of maintenance to asset-intensive organizations, enterprise asset management (EAM) solutions are widely used. EAM is an evolution of computerized maintenance management system (CMMS) software better suited to enterprise-wide deployment and procurement of spares and maintenance, repair and overhaul (MRO) materials. However, since EAM has its roots in CMMS and was often deployed at site level, many organizations have multiple CMMS/EAM systems, making it difficult to maintain consistent asset data.

[1] PWC, Capital project and infrastructure spending: Outlook to 2025

Enterprise resource planning (ERP) solutions, while widely used to run most industrial companies, are often perceived as a poor fit for asset-intensive organizations because they lack a full-blown, integrated set of EAM modules and ERP vendors may lack experience of serving asset-intensive industries. Certainly the industry experience and depth of EAM functionality that an ERP vendor possesses are an important software selection concern.



To manage the installation of major new capital assets and complex equipment, asset-intensive sectors also employ best-of-breed project management solutions which often lack integration to ERP. As a result, what has often occurred is a fragmented mix of software, with ERP used for financials, EAM or multiple CMMSs responsible for maintenance, and standalone project tools to manage projects.

But what if one modular software system could span EAM, ERP and project management? Call it an enterprise solution for asset-intensive companies, but this type of modular, yet broad, footprint system is what is needed in sectors such as mining, pulp & paper, steel, or ports/terminals. With modularity, applications may also be deployed in best-of-breed fashion, with a modular EAM application integrated into a pre-existing ERP system.

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In this white paper, we will discuss the characteristics of ERP for asset-intensive industries, and examine how a modular, adaptable combination of ERP, EAM, and project management will help meet challenges including:

- Effective handover of new assets from design into operations
- Greater uptime and equipment reliability
- Rationalization of spare parts and leaner supply chain and procurement processes
- Support for regulatory compliance and voluntary standards such as ISO 55000.

ONE MODULAR SOFTWARE SYSTEM THAT SPANS:

- ☑ ERP
- ☑ EAM
- ☑ Project Management

LIFECYCLE SUPPORT

According to the Institute of Asset Management (IAM), asset management "involves the balancing of costs, opportunities and risks against the desired performance of assets, to achieve ... organizational objectives." As IAM[2] notes, asset management is all about optimizing the delivery of value from assets, and spans different timeframes within an asset's lifecycle.

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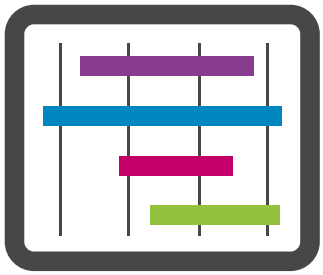
In practical terms, this broad view of asset management means the success of asset-intensive organizations is inseparable from how well the organization manages the lifecycle. So it's not just a matter of effective maintenance procedures or having good equipment monitoring, but also of having tight control over capital projects, close collaboration with EPCs, and effective handover of

[2] The Institute of Asset Management (IAM), What is Asset Management?

asset design data into systems for procurement and maintenance. Excellence in ALM also spans a range of other processes, such as rationalizing MRO suppliers, consistently measuring asset performance, and managing capital projects and human resources assigned to projects.



Attainment of these broader ALM goals is why as important as maintenance is to asset-intensive organizations, a standalone EAM system is not going to fulfill all ALM goals. Supply chain processes, HR master data and other areas are best handled by ERP systems. Yet because of the shortcomings of most ERP solutions when it comes to asset management, a standalone EAM system is often considered the most "critical" business system by asset-intensive organizations.

For example, the smooth handover of assets from EPCs and design teams into the hands of the operating company sets the stage for success in efficiently running that asset and deriving maximum value from it over time. Ideally, this handover should not be a cumbersome "point to point" linkage between EPC design systems and multiple CMMSs, but should flow into one consistent repository for asset master data. An EAM/ERP solution with a common schema for asset engineering data can serve as this "single source of truth," and help an enterprise participate in building information modeling (BIM) initiatives. BIM is a collaborative approach to design and construction that leverages 3D design models and associated data to better manage building and asset information over the entire lifecycle.

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With a modular EAM/ERP solution, the organization has a consistent asset record and hierarchy that can be tapped for everything from procurement to projects to HR records that track who is certified to run or maintain specific assets. And when an asset is due for a major upgrade, you want the related asset data to flow right into the project control and costing for the upgrade project. To handle all of these broader ALM priorities, EAM alone won't do it, a generic ERP system or legacy HR system won't do it, but selecting a solution that comes at ERP from a project and EAM perspective will be able to meet these goals.

MAINTENANCE PRIORITIES

A modular ERP solution with a full set of EAM functions allows the best of both worlds: tapping EAM's functions for maintenance excellence alongside ERP's effectiveness in areas such as finance, supply chain management and logistics. For instance, a standalone EAM system might be able to trigger an order for a critical piece of equipment that has failed, such as a pump, but it's also crucial to operations that managers have visibility into exactly when that pump is going to be delivered.

Of course, an ERP vendor's EAM solution should have best-in-class EAM functionality. Key capabilities include:

- Deep asset hierarchy functions, linked to a fixed asset register, and including maintenance history for each asset
- Planned maintenance plus workorder scheduling and resource optimization features, including what-if simulation
- MRO and spares procurement
- The ability to maintain personnel records regarding competence, certifications and training
- Mobile apps to support technicians and repair/inspection processes in the field or far-flung sites
- Reporting and analytics around crucial measures such as overall equipment effectiveness (OEE)
- Risk- and reliability-centered maintenance (RCM). RCM functionality allows a company to perform maintenance based on reliability patterns rather than standard preventive maintenance schedules
- Structured failure management capabilities that allow a company to better analyze the root causes of failure by asset class while supporting workflows for corrective action.

When an ERP solution can combine these ease-of-use qualities with the business-critical EAM and project control functions that asset-intensive companies absolutely need, then it becomes a highly effective applications platform.

The value of EAM capabilities and effective asset management has been well documented. In a 2012 study on the business case for asset management, Aberdeen Group[3] found that "best-in-class" performers at asset management reduced maintenance cost by 30 percent compared with 13 percent for average performers, and that the best in class enjoy less than a tenth of the unscheduled downtime, and 26 percent higher OEE versus laggards.

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Consider the value of consistent OEE measurement across sites. OEE is a composite metric that looks at availability, quality, and performance/output from an asset. An EAM solution can help with OEE by providing a consistent means of tracking the details of downtime related to maintenance, which impacts availability. Modular ERP with integrated EAM software is well positioned to support OEE because it can bring together the three factors involved in tracking OEE.

EAM works best when integrated with a company's ERP-level processes. For example, while most EAM solutions are capable of triggering orders for spare parts or MRO supplies, it is often the case that the ERP system holds additional data about supplier performance, or can provide visibility logistics or global trade issues.

Another issue for which a combined EAM and ERP solution is well suited is rationalizing which spare parts are held, how many are held, and where. There

3 Aberdeen Group report, Dec. 12, 2012, Asset Management: Building the Business Case for the Executive

are huge efficiencies to be gained in this area. According to MRO@naltyics, an advisory and consulting firm, within asset-intensive industries such as large process industry plants, typically more than 15 percent of spend and 75 percent of transactions are tied to MRO materials and activities.[4] Strategies such as right-sizing MRO inventories and analyzing stock-out risks should be pursued, the firm advises.

REGULATORY SUPPORT

Better master data for ALM and maintenance is also essential to another top priority for asset-intensive industries: regulatory compliance and adherence to safety standards. While EAM functionality is not a "drop-in" means of compliance and/or standards such as ISO 55000, by having one single system that takes a strategic, long-term planning view of critical equipment, the company is in a better position to prove its asset management procedures are sound. A combined EAM and ERP solution supports this goal by establishing one single source of truth for asset data within the operating company, and should be capable of tracking the tasks handled by subcontractors.

Asset-intensive organizations typically face multiple compliance or regulatory pressures, including:

- Occupational health & safety regulations
- Environmental and emission rules and programs
- Industry and professional certifications
- Voluntary standards such as ISO 55000 for asset management and ISO 14224 for equipment reliability.

COMPLIANCE/REGULATORY PRESSURES:

- Occupational health & safety regulations
- Environmental and emission rules and programs
- Industry and professional certifications
- Voluntary standards such as ISO 55000 and ISO 14224

In truth, compliance with most of these regulations and initiatives requires careful planning, documentation of responsibilities, governance processes, and leadership. A software system is not going to make a company compliant. However, regulators and auditors are looking for established processes, and proof of how certain events or tasks are handled within an organization. For example, an EAM solution with structured failure management functionality can help an organization prove it has solid procedures around asset failure analysis and corrective actions.

Because a modular ERP/EAM solution acts as a consistent single system for authoring and accessing asset data and responsibilities, it simplifies compliance. Additionally, if the system has document management capability, this further eases the auditing of procedures.

[4] MRO@naltyics website, corporate benefits page. http://www.mro-analytics.com/

A COHESIVE, SINGLE SYSTEM

Perhaps the biggest software selection criterion for asset-intensive organizations is that the system be a cohesive solution that is able to bring together project management, EAM, and ERP under one integrated software suite. This allows for better asset management over the entire lifecycle, and keeps maintenance, production operations, and corporate processes aligned. From a practical standpoint, asset-intensive organizations should consider some of following capabilities enabled by a modular solution that spans project-focused ERP and EAM:

- From the ERP system's production management function, can you see maintenance processes which impact operations, such as scheduled preventive maintenance events? Being able to see production and maintenance requirements within one streamlined user interface saves time and avoids bottlenecks from lack of visibility.
- Does the EAM solution provide users with access to project history, and conversely, are project management functions able to easily access as-maintained asset history? Ideally, EAM and project management should have effective integration.
- Is your present EAM solution truly multisite, providing the organization with asset master data and maintenance records across all sites, with an asset design repository that is capable of taking in data from multiple EPCs and design environments?
- Does the EAM system support consistent identification and naming of parts, and is it integrated with ERP's procurement and logistics functions to support MRO parts rationalization and supply chain initiatives, such as being able to share costly spare equipment between sites, or even between companies?
- Does the EAM solution support field service scheduling that takes into account the time and distance it takes technicians to travel to a far-flung asset to complete work?

In short, asset-intensive organizations lacking an enterprise software foundation will be well-served by a modular solution that spans EAM, ERP and project management. By choosing a modular architecture, they also have the flexibility to implement only what they need in a best-of-breed manner, or gradually phase in the whole suite.

For example, some companies might want to first establish ERP functions such as financials, project control, and supply chain management, and then later deploy core EAM functions including mobile workforce management, followed by RCM at a later stage. Modular solutions are necessary for this agile deployment approach.

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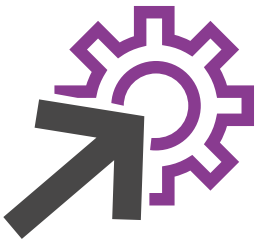
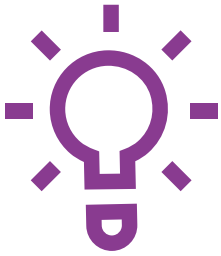


- Can you see maintenance processes that impact operations
- Can users and managers easily access asset history, including as-maintained history
- Is your current system truly multisite
- Do you get support for consistent naming and ID of parts
- Is it integrated with procurement and logistics
- Does it support field service scheduling

Finally, the applications themselves should be intuitive and easy to navigate for the individual end user. By intuitive, this means that instead of memorizing which screens to access, the user should have a graphical, role-based user interface that simplifies the top action items, workflows, and metrics of interest. When an ERP solution can combine these ease-of-use qualities with the business-critical EAM and project control functions that asset-intensive companies absolutely need, then it becomes a highly effective applications platform.



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