

View Point



Modernizing and Consolidating

Enterprise-wide Asset Management Applications

Praveen Agrawal, Bharath Sasihithlu

Abstract

Predictability and accurate forecasting of performance are critical for today's companies. Asset-intensive organizations such as those in the power, utilities and oil and gas sectors, among others, need the required support structure of IT to help them manage their enterprise assets and provide a single window to administer asset related 'Maintenance' and 'Tracking' functions. Saddled with obsolete or disparate Enterprise Asset Management (EAM) solutions, these organizations are looking to modernize and consolidate EAM solutions to successfully predict their asset's performance and utilization, drive efficiency through improved supply chain and customer management processes, and enhance user experience within the EAM solutions. They are striving to maximize performance, reducing overall cost through improved efficiency with fewer applications or instances.

Traditionally, these organizations grapple with multiple or outdated EAM packages owing to acquisitions, technology limitations, applications capability, geographical spread, and lack of synergy among business units. To realize maximum business benefits from their critical assets these organizations are considering business process harmonization across their plants - upgrading software and modeling processes into a common application built on state-of-the-art technologies to reach the next level of maturity. Some of the benefits of this approach include operational efficiency using business process improvement, reduced redundancy and inconsistency across applications, and reduction in overall cost of operations.

However, an organization must pay heed to several factors to ensure a successful consolidation and modernization exercise. Infosys talks with Praveen Agrawal and Bharath Sasihithlu from Infosys' Enterprise Asset Management practice to find out what it takes for the organizations to attain these high standards of asset utilization.

The Need for Consolidation

Why are companies looking to modernize and consolidate their asset management application landscape?

Praveen: Globally, asset-intensive industries are dealing with numerous challenges such as increasing customer expectations, high safety and reliability levels, corporate responsibility, and operational efficiency. With the inefficiencies or failure of vital assets adversely impacting revenues and reputation, companies have a lot at stake when it comes to improving asset performance by leveraging best practices, efficient processes and the latest technologies.

Disparate and standalone software applications in asset management, dispatching, scheduling, and financials reduce visibility of overall operations and compromise timely decision making. Many companies are using multiple applications and versions owing to technology and application limitations, acquisition of plants using dissimilar applications, and large geographical spread.

Technology advancements (smart devices, sensor integration), applications consolidation (ABB acquiring Ventyx, IBM acquiring Maximo and Drawbase), and availability of new industry solutions represent viable solutions for companies seeking to leverage benefits and proceed to the next level of maturity.

The key challenges necessitating a consolidated asset management solution include:

- Reduced Visibility - Multiple applications reduce visibility into availability of resources across plants or regions. Further, companies are unable to accurately measure performance metrics.
- Fragmented Business and Operational Processes - Decentralized planning and scheduling creates disparate business processes, hampering efficient sharing of work and resources among plants.
- Increased Cost - Increasing operational and support costs for Enterprise Asset Management (EAM) packages.
- Lack of Scalability - Existing systems are unable to handle new enterprise applications and leverage new technologies and advanced solutions such as analytics, technical publishing, planning and scheduling mobility solutions, and predictive maintenance.
- Low Business Agility - Existing EAM packages are unable to cope with the expanding business, handle process improvements and streamline operations and management, which can lead to poor decision making, user frustration, and ineffective working environments

Bharath: An asset-intensive organization must ask the following questions. If any of the answers is in the affirmative, its needs to modernize its EAM application. The questions are:

- Did the organization recently expand its business through a merger or acquisition and find that support systems like the current EAM application is incapable of expanding along with the business and cannot handle the process improvements needed to streamline operations and maintenance?
- Does the organization feel improvements are needed in process and solutions when it comes to dealing with external partners such as suppliers and customers?
- Is the data in the EAM application hampering performance when it comes to business agility, taking informed decisions, reducing user frustrations, and ensuring stable work environments?
- Is the IT department finding it difficult to offer advanced services and solutions for ever-increasing business needs like analytics, technical publishing, planning or scheduling?
- Is the management concerned about the never-decreasing operating cost of the EAM applications which may or may not include a complex web of applications - some bespoke and some commercial-off-the-shelf (COTS) applications?
- Is the organization upgrading its corporate or enterprise applications like ERP to newer versions and the current EAM application cannot handle the new enterprise application versions?

What are the drivers for consolidation? IT or business?

Praveen: Usually consolidation is driven by both business and information technology factors. Organizations with a smaller application landscape (2-5 applications or versions) or those requiring technical upgrades due to support issues or obsolete technologies are mainly driven by IT. Consolidation in organizations with a vast landscape of applications is generally driven by business needs.

Bharath: Most organizations require a consolidated asset management application for several reasons. The business, process and IT departments must jointly identify and recognize the need to realize maximum value from an upgrade project. The need for an advanced application to manage enterprise assets can be generated from anywhere, such as:

- Asset standardization such as identification, recognition and tracking
- Common process rollouts across business units
- Enforcing best practices within operation and maintenance functions across the organization
- Data aggregation, de-duplication and standardization
- Escalating maintenance cost due to dispersed legacy instances / applications

Additionally, IT departments are responsible for recognizing the need for better IT asset management to improve asset availability and fault recognition. For instance, establishing a central command center that manages the organization's decentralized and remote IT assets can

significantly improve IT operations. Further, effective IT asset management helps improve IT bandwidth, which in turn supports business functions.

What end-state do you envisage from this consolidation?

Praveen: Upon consolidation of the EAM landscape, companies can look forward to several benefits. Not only does consolidation lead to fewer applications and common business processes, but it also ensures better visibility into resource availability leading to better utilization and wider usage of the mobility solution enabling the field workforce to report correct data on a real-time basis.

Organizations also move to new software applications or versions which provide stability and longevity to their software application landscape in terms of supported versions, leveraging best practices as provided by new versions or industry solutions, and latest technological advancements.

Bharath: The consolidation exercise leads to the creation of a single source of truth for enterprise asset tracking and management. Organizations can create a consolidated 'Center of Excellence' (CoE) team from Business and IT for governance on usage and proper administration of application. This sustains the application runtime and handles long-term training and knowledge sharing to standardize system usage.

Key Focus Areas

What are the best practices for process harmonization?

Praveen: Asset-intensive organizations deal with critical assets where they can incur heavy costs with minor downtime or a small accident can lead to environmental damage. Multiple plants or production units within these organizations typically have similar assets and asset-handling processes. However, the business units often use varying processes due to multi-country/region spread, new acquisitions and multiple underlying IT applications.

Process harmonization among these units can improve efficiency and reduce overall cost of operations. It enables each business unit to leverage the best practices followed by other plants and achieve greater enterprise collaboration.

While engineering process harmonization, organizations can consider the following guidelines for common business processes:

- Seek a long-term solution which fits all
- Allow localization but only for genuine critical cases like region-specific regulatory requirements
- Engage affected users since the beginning of the harmonization process
- Take a practical approach to harmonization - while it may appear to be an ideal situation in some cases, it may not always be practically possible

In fact, process harmonization in the Asset Management area is relatively simpler as compared to Finance Management or HR Management. For example, an offshore oil exploration unit in the North Sea will produce oil in the same way as another unit in the Gulf of Mexico. The only significant difference is in terms of dealing with region-specific safety and regulatory requirements.

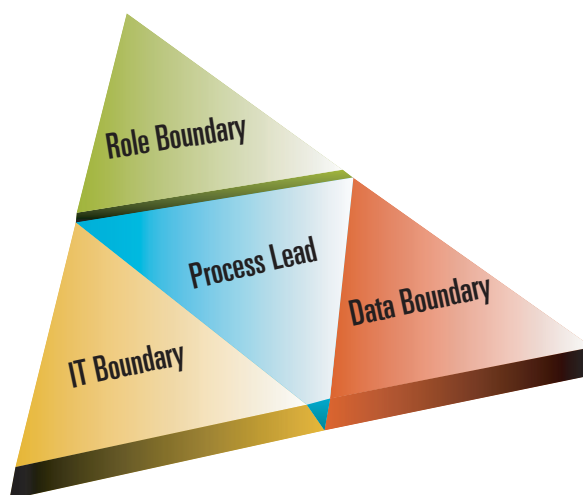
Bharath: Process harmonization refers to articulating and designing a process that is futuristic, standardized, non-complex, and flexible to accommodate regional specificity. It requires organizations to set proper objectives and goals for the consolidation and upgrade project and create a process lead/ champion for impacted business areas.

A key factor in implementing process harmonization, the process lead requires a support structure to communicate and coordinate process requirements to satisfy the internal and external environments. The process lead must work within three boundaries to create a robust process:

User or Role Boundary - A complete and comprehensive 'Role Mapping' exercise with inputs from all stakeholders must be undertaken and mapped accurately to the process definitions before finalizing the end process. This is important to ensure long-term solution maintenance.

IT Boundary - Once critical IT areas are identified (such as IT strategy and IT architecture), these must be communicated to process leads to define IT boundaries for efficient functioning.

Data Boundary - The current data must be able to support the decisions made, which can be confirmed by testing the process with data from current legacy applications. This also helps to articulate the design considerations to the user community for their buy-in. However, process leads need to be careful to avoid over-engineering, which can create rigidity that prevents any localization and external organization fluctuations.



As a considerable amount of data exists in older systems, what care must be taken care of while moving to a new system?

Praveen: A sound data management and upgrade strategy is critical for successful consolidation. While transactional records have a limited life, a master record is relatively permanent and hence requires careful cleansing and migration. Since data needs to be collected from multiple applications or versions during migration, this exercise requires a methodical approach to preserve data integrity, such as:

Health Check - A thorough assessment of existing data for data completeness, duplication, standards, naming conventions, etc.

Classification - The involvement of business users is necessary to define the new data structure. This includes levels of asset hierarchy, item-specification templates, etc.

Transformation - Data must be cleansed and modified based on the previous assessment and classification recommendation.

Data Loading - Only validated and cleansed data must be loaded into the new system.

Organizations need to be cautious while consolidating their data since inaccurate data can compromise the whole system and increase operational cost.

Bharath: Mismanagement of data can be due to several factors, such as:

- Skewed management reporting on the operational parameters
- Failure to share learning across departments or across geographies due to non-standardized data
- Operational hazards due to wrong classification of data

An upgrade project is an opportunity for the business to recognize limitations due to mismanagement of data. A well-defined approach and multiple steps to validate data consistency and integrity can ensure a successful implementation.

Considering the major shift a consolidation exercise constitutes, how important is change management?

Praveen: An effective change management strategy is a key determinant of a successful modernization implementation. Such a strategy focuses on the impact the implementation has on the end users of asset management systems. These users include field engineers, maintenance planners and schedulers who work on critical machines in often unfavorable situations. Pressed for time, the users may resist having to learn how the new system works and set tough user expectations.

In such a scenario, it is important to develop a comprehensive change management strategy that involves the end users from the beginning. At the outset, implementation teams must identify key business users and engage the endusers through them.

Some common change management techniques are:

Achieve Leadership 'Buy-in' - A team of key leaders and user champions can be leveraged to inform and motivate end users about the purpose and goal of the modernization program.

Define Communication Plans with End Users - End users must be constantly updated on upcoming changes through two-way communication methods, face-to-face sessions, workshops, etc.

Assess Business Readiness - Identify organizational challenges and success enablers and develop mitigation strategies to address readiness issues.

Audience Analysis - Identify the key impacted users, analyze current skill levels and new training requirements and accordingly plan the training modules to minimize user frustrations.

Bharath: Any new software implementation project is a 'Change'. However, what drives this change is the reason or objective for the change. Irrespective of the reason, the change inherently impacts people and the organizations must consider these impacted elements. An effective change management strategy can be executed using a project committee with a clear project objective. The committee focuses on two principal elements - minimizing the impact of change on the user community and maximizing the usage of the new application.

Establishing the project objective requires a deeper understanding of the goals of modernization and its impact on the users, as explained below:

- If the objective of the change is to increase asset reliability, the expectation from the end user is to accurately and continuously capture data on the assets' operational and maintenance parameters.
- If the objective of the change is to increase the service offerings to customers, the expectation from the end user is to capture accurate service definitions and service delivery parameters to articulate the value to the customers.
- If the objective of the change is to standardize the maintenance process for assets across the enterprise, the expectation from the system is to harmonize the process through the enterprise and expect the user to follow the process to minimize the operational costs through shared learning.

A simple case of non-standardized data leading to ballooning operational costs: Consider two Operations & Maintenance (O&M) departments involved in asset repair and maintenance. They use the same production/ operational asset for daily operations, which is clearly specified. However, the maintenance department has not standardized the spare parts or material required for asset maintenance. Here, the company procures different spare parts from single or multiple vendors and is unable manage the materials adequately or negotiate a better purchasing rate with the vendor. This leads to inefficient spare parts management, which in turn adversely affects the company's operational cost.

Hence, identifying user expectations at the beginning of the project, communicating the need for process improvement, empowering users to share their knowledge, and simplifying the user experience with the system can enable organizations to achieve the business objectives of modernization.

What kind of value additions should organizations look for?

Praveen: Usually, the organizations' need to consolidation can be divided into two areas:

Like-for-Like Solution - This involves de-supported applications and upgrading underlying software such as database and hosting applications. Here, the value addition is limited since organizations look for a like-for-like upgrade without any major impact on end users.

New Value Additions - Here, organizations can benefit from several value additions such as:

- Implementation of industry-specific solutions such as regulatory systems, safety and reliability in the oil and gas industry and Geographical Interface Systems (GIS) in utility industries
- Implementation of new software tools such as scheduling and dispatching
- Implementation of common business processes across plants or units
- Expansion of existing mobility tool usage

Bharath: Offering advanced functionality as opposed to legacy versions, newer EAM applications involve a package of offerings such as industry-specific solutions and advanced features such as scheduling and structuring a complex item assembly structure. They also offer several solutions from an IT architecture perspective in terms of new architecture for integration such as web services and the ability to integrate corporate-level business intelligence solutions.

Asset-intensive organizations can face several challenges when implementing key value additions. For instance, customers may continue to use Maximo as-is at the beginning of an upgrade project, which can render the post-upgrade EAM application as an application for work order generation that simply manages bare master data to create work orders. Organizations must ensure that the usefulness of upgraded EAM applications is leveraged in an optimum way by identifying areas to:

Reduce Data Duplication Across Multiple Systems - By designing a 'System of Records' within their enterprise, they can reduce the cost of maintenance of all applications.

Recognize Business Value - Areas that generate business value can be tracked within the EAM application by using features such as 'Condition Monitoring' and 'Predictive maintenance'.

Recognize Areas of Usability Improvement - This involves leveraging mobility and pervasive devices such as Radio Frequency Identification (RFID) and Global Positioning System (GPS) for Asset Spatial Management.

Recognize Areas of Standardization - These include data, IT architecture, application usage, business intelligence, and document management systems.

Risk and Risk Mitigation

In your experience, what are the usual pitfalls?

Praveen: Consolidating and modernizing enterprise-wide asset management requires a large-scale technology and process change similar to implementing a new system. These initiatives present unique challenges due to process and technology change. Involving significant effort and affecting a large number of users, such projects require the implementation of proper planning and risk mitigation strategies during the project lifecycle. Some of the critical risk factors to be considered are:

- Plants/regions not ready to adopt new harmonized processes
- Non-coordination among plants/regions
- Lack of commitment from stakeholders; mainly business, IT and third-party vendors
- Fear of change among end users
- Delay due data collection and cleansing activities
- Lack of dedicated staff from business units and IT

Bharath: Common pitfalls include:

Over-engineering the Solution Process - The new process can inhibit usage of the system due to controls and authorizations. Further, there can be delays due to data collection and cleansing activities.

Over-automation of the Solution - IT departments need to be aware that designing complex algorithms and routines and tight integration points results in complexity during future upgrades.

Inadequate Change Management and Training to End Users - End users in existing plants across geographical regions can be resistant to adopting new harmonized processes. This requires proper coordination and a change management strategy to ensure dedication from all business units, IT departments as well as stakeholders and third-party vendors.

Insufficient Long-term Infrastructure Planning - Organizations must implement a robust infrastructure that can manage system performance and maintenance against expected user load and usage.

Inadequate Support Structure for End Users - It is important to assist and guide the users on proper usage of the system. For this purpose, asset-intensive organizations need a central governance team to monitor and guide users and stabilize the system.

Improper Identification of Impacted Communities - In larger projects involving process re-alignment or process re-engineering, the organization must accurately identify all impacted communities such as application partners (vendors and customers), external application stakeholders (Enterprise Resource Planning, Business Intelligence) and user communities (end users, business, steering).

Employing Value Levers

What are the best practices you suggest these organizations follow to move to a consolidated system?

Praveen: As mentioned in the previous section, these are the complicated projects and to make them successful, certain critical factors must be considered. Some of those important factors are:

- A strong and committed executive sponsorship
- Equal participation from all affected business units
- Allocation of strong, knowledgeable, and dedicated personnel who can work with authority and have ability to take key decisions
- A capable system integrator who has experience in delivering the similar projects
- Smooth co-ordination among different functional teams and departments for business requirements, process flow and agreement for the common standard process
- User involvement and user buy-in from the beginning of the project
- Encourage users to participate openly in workshops by raising their concerns/pain points, creating a wish-list and offering suggestions
- Strong and focused Project Management Methodology

Bharath: Consolidation is standardization. Consolidating enterprise asset management applications involves creating a standardized process capable of handling multiple applications in a unified manner. A successful implementation is a complex process that requires a planned approach with proper risk mitigation to ensure lowered total cost of ownership. Standardization should be sought in the following areas:

Process Standardization - This is critical to avoid conflicts of usage which can hinder effective consolidation. Organizations must identify and design a unified process across all business verticals and ensure that only authorized users can access the system.

Data Standardization - This reduces data redundancy and increases data integrity, which promotes usage of common processes within the system.

Architecture Standardization - This reduces integration points or curbs usage of point-to-point integration, consolidates applications within the system by recognizing a 'System of Records', and reduces data duplication across applications. Further, it promotes usage of non point-to-point integration architecture such as web services and middleware for integration.

Non-functional System Standardization - This promotes usage of enterprise standard applications for non-functional requirements such as Enterprise Document Management System for managing corporate document publishing, Enterprise Business Analysis and Reporting for management reporting, and Enterprise master data management system for managing organization-wide master data.

How do you see System Integrators playing the role of a partner in this journey?

Praveen: System Integrators play a complementary role in these programs. Based on their extensive experience and domain knowledge, system integrators can provide best practices in these areas as well as in upgrade and consolidation and data and change management. Thus, their presence is very crucial to success of these programs.

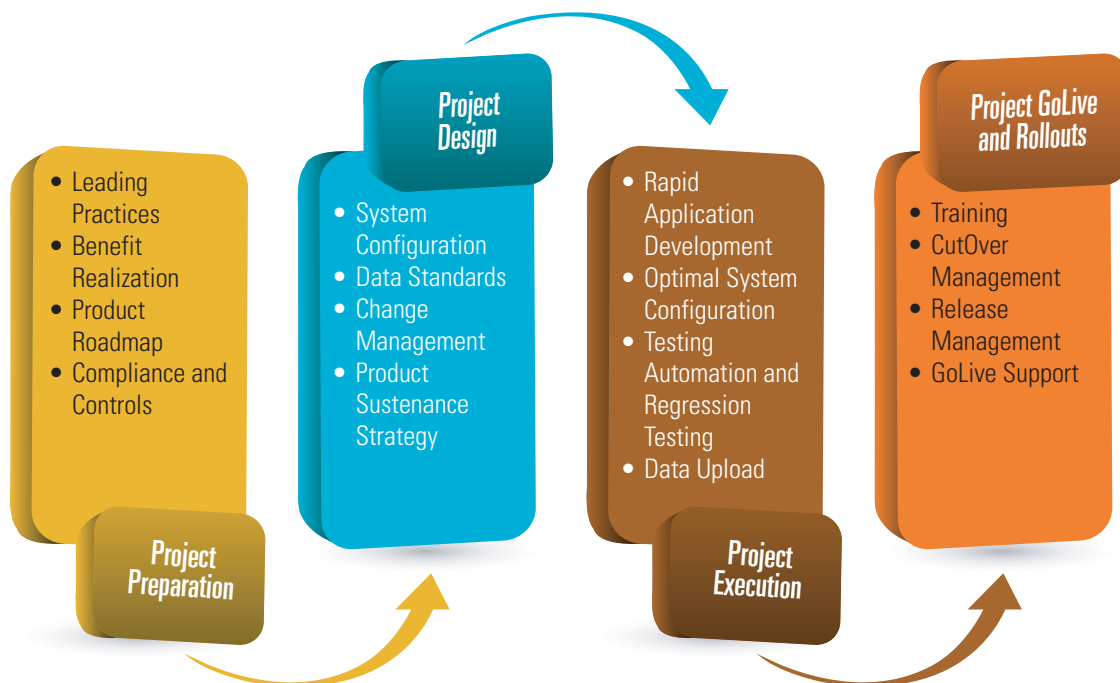
Often, good system integrators play the role of partner rather than just a vendor. It is useful to engage a system integrator throughout the project lifecycle since their experience with multiple program implementations can ensure that the organization's implementation strategy is effective and successful. Further, most system integrator companies have alliances with product vendors, making them a reliable organizational resource even for minor requirements.

Bharath: Deciding on a system integrator depends on the scale of the upgrade project, which is influenced by factors such as the number of legacy systems, number of users impacted (internal and external), percentage of process improvement envisaged as well as the quantum of automation identified.

System integrators provide substantial knowledge and value in the following areas:

- Process improvement for better agility in Supply Chain Management and Customer Relationship Management
- Deploying new systems such as mobility to augment EAM applications for increased usage
- Identifying critical areas in integration such as Chart of Accounts mapping between an organization's Enterprise Resource Planning (ERP) and Enterprise Asset Management (EAM), Invoice Processing and Master Data synchronization
- Improving data integrity such as data cleaning and loading
- Testing or validation such as regression testing automation
- Training material development and super user training
- Go-Live preparation

Today, organizations are looking at 'Rapid Application Development' or 'Agile Implementation' to quicken the benefits realization cycle of software implementation projects. In such situations, organizations can achieve more in less time using the automation tools that are brought to the project by system integrators.



About the Authors

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Praveen has more than 14 years of experience in development and implementation of EAM packages. He is responsible for Infosys' EAM Center of Excellence where he works for EAM solution development. He has executed multiple global consolidation and upgrade projects on various EAM applications such as Maximo, Oracle Application and Ramco.

Bharath Sasihithlu

Sr. Project Manager - Enterprise Asset Management (EAM) Practice

Bharath is an EAM evangelist and practitioner with more than 10 years of experience working on complex IT projects. He has deep expertise in executing Maximo implementation projects dealing with process re-engineering, multi instance consolidation, version upgrades and global support and maintenance across asset types of 'Oil & Gas', 'Energy', 'Transportation', 'Facilities', 'Telecom' and 'IT' assets.

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