Tivoli® software

Understanding the real risk
for asset-intensive companies.

Contents

Executive summary

The goal of having one enterprise resource planning (ERP) solution for all business processes is still popular, yet the idea is no longer practical, particularly in asset-intensive industries. Changing requirements in the areas of compliance and risk management are increasing the pressure on an enterprise's operations group to manage their assets to higher standards and to demand the best available solution for people, process and technology.

Changes in technology such as service-oriented architecture (SOA) and Web services eliminate the need to compromise operational effectiveness. Platform-oriented strategies of the large enterprise software vendors, and the adoption of standards-based architectures, blur the boundaries between what is developed by the large ERP vendors versus those with specific business-critical functions.

There are some common misconceptions about the value, capabilities and deployment of ERP solutions in asset-intensive industries. In this white paper, these myths are discussed and demystified so that decision makers in these asset-intensive industries can better understand what the real risk is.

Myth 1: ERP solutions are sufficient to manage the infrastructures of asset-intensive companies

In asset-intensive industries, failure of a critical asset infrastructure can have a detrimental impact on an organization not only from a financial perspective, but also from a social and environmental viewpoint. For a multi-national company, an asset failure can be the kind of event that makes headline news. This type of risk or failure can often be measured in the hundreds of millions of dollars, a risk that organizations cannot take lightly. When large companies look for asset management solutions, it is imperative that they implement the best technologies available.

Company executives, sometimes supported by reports from renowned analyst firms, may claim that the modules for managing assets that are part of the financial systems are sufficient. But for organizations that manage critical asset infrastructures, there is too much risk associated with this compromise. It increases the operational risk for the organization and sends the wrong message to its employees when a company selects an insufficient solution. The financial performance of the company, the safety of the workforce and the preservation of the environment are at stake.

Facts

- *An asset-intensive company that experiences a severe safety or environmental incident can easily incur a problem measured in the hundreds of millions of dollars.*
- *Part of the IBM Tivoli® software portfolio, IBM Maximo® Asset Management is considered the "gold standard" for asset management.*

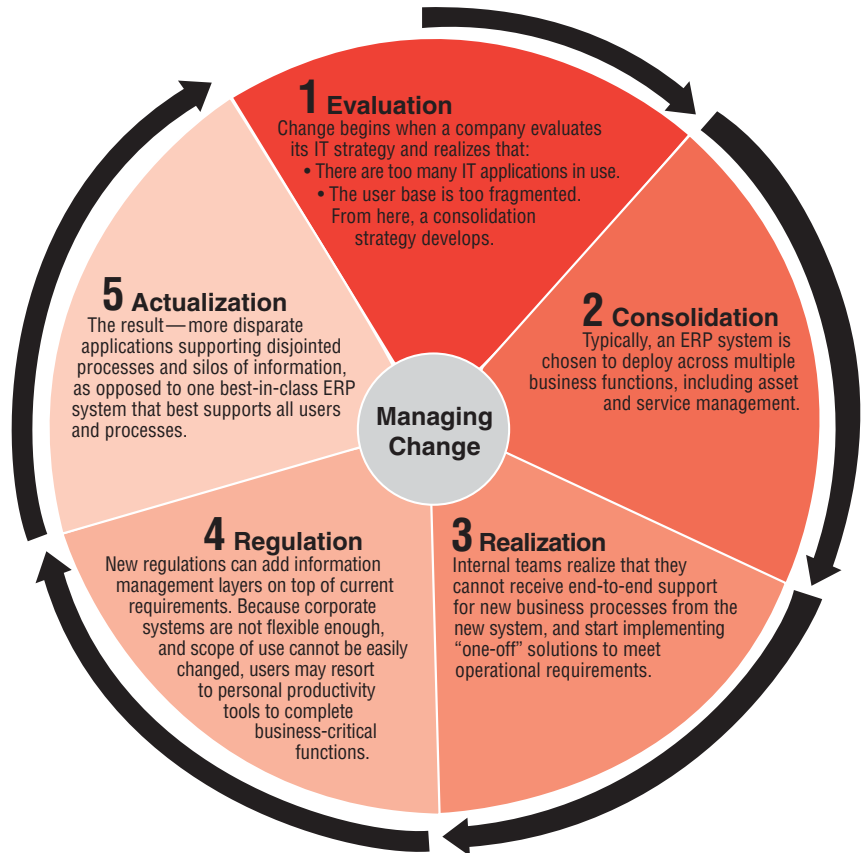*ERP solutions force asset managers to create unsupported applications in order to fill functional gaps.*

Myth 2: An ERP solution will lower IT costs and risk

Asset-intensive companies that use an ERP solution for asset management typically end up with only 60 to 80 percent coverage of their functional requirements. What about the remaining 20 to 40 percent? What do people do when they have a need for application capabilities that the ERP solution doesn't support? They create their own solutions. Independent departments use productivity tools to create applications "on the fly" to deal with changes in regulatory requirements or changes in business process. These applications are sometimes called renegade applications.

These applications are created to fill a functional gap in a larger system, such as ERP, in order to enable the company to better complete its operational mission. Often based in Microsoft® Excel®, Microsoft Access or some small niche application, these stop-gap solutions/applications are generally not secure, not supported by the IT organization and not auditable. They are costly to integrate and are typically managed "under the radar" by one person or small group. The implications of these types of applications are two-fold.

- *They increase the cost of IT.*
- *They increase the operational and regulatory risk (e.g., Sarbanes-Oxley, Basel II) to the organization, as there is no longer a single, readily auditable repository of information related to the assets.*

Figure 1: The life cycle of a renegade application

1 Evaluation
Change begins when a company evaluates
its IT strategy and realizes that:
• There are too many IT applications in use.
• The user base is too fragmented.
From here, a consolidation
strategy develops.

2 Consolidation
Typically, an ERP system is
chosen to deploy across multiple
business functions, including asset
and service management.

3 Realization
Internal teams realize that they
cannot receive end-to-end support
for new business processes from the
new system, and start implementing
"one-off" solutions to meet
operational requirements.

4 Regulation
New regulations can add information
management layers on top of current
requirements. Because corporate
systems are not flexible enough,
and scope of use cannot be easily
changed, users may resort
to personal productivity
tools to complete
business-critical
functions.

5 Actualization
The result—more disparate
applications supporting disjointed
processes and silos of information,
as opposed to one best-in-class ERP
system that best supports all users
and processes.

Managing Change

For example, regulated industries are required to track deviations of intended
operations and follow a predefined process for root cause analysis. Large
ERP vendors do not offer corrective action modules to support these
requirements. Some companies build Access databases to address this problem.
Other companies buy niche applications to solve it. In both cases, these
applications need to be maintained, integrated and supported on top of the
enterprise application.

Highlights

Unsupported applications increase operational risk and cost.

ERP deployments are often funded by business cases that are based on reduction of total cost of ownership (TCO) by rationalizing the application portfolio of the enterprise, following the formula $\text{TCO}_{\text{Enterprise}} = \text{TCO}_{\text{ERP}}$. It seems more correct to extend this formula to take into account the impact of renegade applications: $\text{TCO}_{\text{Enterprise}} = \text{TCO}_{\text{ERP}} + \text{TCO}_{\text{Renegade}}$. Because they are not supported, renegade applications are often a compliance risk. According to Section 404 of the Sarbanes-Oxley Act, companies need to be able to ensure that applications used to process information are fully documented and supported. So instead of $\text{Risk}_{\text{Enterprise}} = \text{Risk}_{\text{ERP}}$, the real risk to the enterprise is:

$\text{Risk}_{\text{Enterprise}} = \text{Risk}_{\text{ERP}} * \text{Risk}_{\text{Renegade 1}} * \text{Risk}_{\text{Renegade n}}$.

Organizations that use general-purpose ERP systems to manage their critical asset infrastructure may be putting their companies at unnecessary risk and expense. They may not be able to achieve their goal of application consolidation. Instead, they could end up with an abundance of newly developed, unsupported applications that not only increase the operational risk of the organization but increase the cost of IT as well.

Facts

- *$TCO_{Enterprise} = TCO_{ERP} + TCO_{Renegade}$*
- *$Risk_{Enterprise} = Risk_{ERP} * Risk_{Renegade 1} * Risk_{Renegade n}$*
- *The chain is as weak as its weakest link (e.g., Renegade 1…Renegade n)*

Myth 3: Integration of best-in-class solutions with ERP is complex, risky and costly

One of the old arguments in the enterprise vs. best-in-class debate is that it is very costly to integrate a best-in-class solution with an ERP system, and that any integration will increase the risk of the project. There are three points to consider relative to this myth.

- *In most cases, integration risk and operational risk are not equal.*
- *Integration technologies have changed dramatically over the last five years, enabling new levels of integration.*
- *When evaluating integration, one should not only consider the integration between one solution and the ERP but the integration for the entire ecosystem.*

Companies that are managing critical asset infrastructures that can impact people, the environment and the company's financial performance should select solutions that allow them to manage their assets to the highest standards in the areas of safety, integrity and reliability. They should not trade off perceived reductions in IT costs against placing their company at a higher risk (e.g., for potential fines, prudent oversight, accidents, environmental problems, brand/ corporate reputation damage, etc.). Furthermore, integration technologies have matured significantly over the past decade and, as a result of this, the actual cost and risk of integration have changed as well.

Point-to-point integration

With this older approach, applications are connected to each other with dedicated integration points. Users generally build an interface for each requirement using each application's proprietary application programming interfaces (APIs). These interfaces are built specific to the two applications and tied to each other's version and configuration, making the applications tightly coupled. This type of integration is manageable on a small scale. However, it can grow at an exponential rate and quickly get out of control as more applications are connected to each other. For instance, a seemingly insignificant change in one application could affect the interfaces with all other applications to which it is connected, both directly and indirectly.

Hub-and-spoke integration

An update to point-to-point integration, applications are connected to a central integration system, commonly referred to as an enterprise application integration (EAI) hub. The EAI hub, in turn, provides integration services and handles communication from application to application (spokes). While the hub-and-spoke approach does promote centralized management, standardization and reuse, the connections at the spoke typically require some effort. Applications at the spokes may not have APIs, or have proprietary APIs that require development and maintenance related to each change to the applications (upgrades, enhancements, etc.).

Service-oriented architecture

The most modern approach is SOA, an architectural framework for enterprise application services and the interoperability of these services. In order to implement SOA, applications are required to have discoverable, implementable and reliable services. Also, SOA requires a robust platform and the means to explore, discover and route services and messages. Enterprise Service Bus (ESB) is the concept associated with the service invocation and routing aspects of SOA. ESB relies heavily on the platform to manage and route service invocations, events and messages.

Figure 2: Integration approaches

Point-to-point integration   Hub-and-spoke integration   Service-oriented architecture
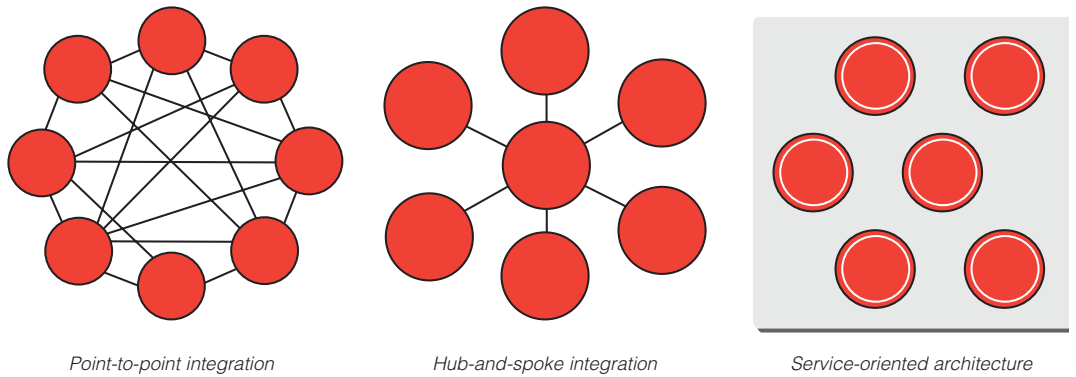
This platform is key to SOA. The majority of the platform vendors, especially the J2EE™ and Microsoft .NET platform vendors are implementing SOA concepts and components into their platforms. Major ERP vendors, realizing the importance and the momentum of SOA, have either built or acquired SOA-capable platforms and are expanding their application provider role to include platform, integration and core services. One of the more recent entrants into this arena is SAP NetWeaver, the enterprise services architecture that SAP has established for deploying business solutions based on J2EE and Web services. SAP acquired a number of technology vendors and began to consolidate these technologies under the NetWeaver umbrella. NetWeaver offers an open standards-based platform, portal and integration technology stack. It allows customers and partners to extend the product to cover functional gaps. It also enables best-in-class vendors to leverage the platform, including the look and feel, to provide seamless integration with ERP applications in a very cost-effective manner.

SOA enables seamless integration with ERP applications.

Facts

- *Maximo software uses an architecture that is built on the same technology standards as the platform architectures of the large enterprise vendors.*
- *IBM Maximo Asset Management has been certified for a number of applications including NetWeaver Application Server and SAP Portals.*

Myth 4: EAM modules from large ERP vendors are functionally rich and equal to Maximo

The large ERP vendors claim that the functional footprint of their enterprise asset management (EAM) modules will soon approach the footprint of Maximo, the EAM market leader. In reality, the gap between Maximo and current ERP solutions is wide and is likely to increase in some important areas. Maximo uses an SOA architecture to quickly develop functional enhancements to the application and bring them to market. These extensions are often organized according to industries or asset classes and provide significant value for industries that have specific asset management requirements, as shown in Figure 3.

Figure 3: Industry-specific asset management requirements

Industry	Requirement
Regulated industries	Calibration, corrective action
Utilities	Compatible units estimating
Transportation	Warranty management, linear assets
Facilities	Key management
Federal government	Real property

The market has shifted its view of asset management as an internal function to a view that asset management is a support service to the business. This concept is called asset and service management and it involves creating a layer around the asset management function that helps create alignment to the business. This helps the business maximize return on assets against limited resources and within a compliance framework. Further, this alignment ensures high reliability at a lower cost. Asset and service management solutions are designed around the people using them. They provide the user experience that drives the engineers to use the system. These systems empower the user, which, in turn, drives higher quality data. Without 100 percent acceptance of the system, it not only becomes worthless, it can become dangerous.

This danger can be highlighted by the following example. In electric utilities, before certain work can be done, the area where the people are working needs to be powered down. The procedure to ensure that workers are entering an area that is not electrified is called lockout/tagout. If the system doesn't get used because it is too cumbersome or hard to use, worker safety can be jeopardized. Granted, what usually happens is that the engineers will develop a renegade application to handle the requirement (see Myth 2). By doing so, management won't always know that there is a systems deficiency.

Facts
- *The Maximo software portfolio has solutions that provide industry-specific functionality for Nuclear Power, Utilities, Oil & Gas, Life Sciences and Transportation.*
- *Maximo's rational consolidation provides businesses with a single set of processes for lower levels of risk and higher levels of standardization. In addition, it helps IT achieve lower cost of ownership, increased agility and a modern architecture that supports greater data visibility and process control.*

Myth 5: The best run businesses use ERP only

Many of the best run businesses use solutions from large enterprise software vendors. Often, SAP or Oracle is selected, but they may not be the best solution for asset management. This ERP approach may make sense when the risk profiles are low. However, in enterprises where the risk profile is high, such as in asset-intensive organizations, you will find that for asset and service management, a majority of the leading global companies use best-in-class solutions like Maximo.

Fact

- *All of the Fortune 100 companies use an ERP system to manage their businesses, but more than half of these same Fortune 100 companies use Maximo to manage and service their business-critical assets.*

Summary

There are some common misconceptions about the value, capabilities and deployment of enterprise solutions in asset-intensive industries. In this white paper, these myths are discussed so that decision makers can better understand the real risk. Figure 4 summarizes the myths identified in this paper and the realities associated with them.

Figure 4: ERP myths and realities

Myth	Reality
ERP solutions are sufficient to manage the infrastructures of asset-intensive companies.	Potential risks associated with an asset failure mean ERP solutions are not appropriate in asset-intensive industries.
An ERP solution will lower IT cost and risk.	Functional gaps and changes in process lead to renegade applications that increase the risk and cost of IT and operations.
Integration between best-in-class solutions and ERP is complex, risky and costly.	Advances in technology have mitigated the risk and reduced the cost of integration.
EAM modules from large ERP vendors are functionally rich and approaching the capabilities of Maximo.	Functional enhancements of the Maximo portfolio have widened the gap when compared to ERP modules.
The best run businesses use ERP only.	Most of the best run companies also use best in-class solutions like Maximo.

Integrating best-in-class asset management can increase the value of ERP investments.

The business process platforms that ERP companies now provide serve as a great foundation for developing a seamlessly integrated environment that is based on solutions from multiple vendors. Organizations can view this as an opportunity to use best-in-class solutions that are built on the right architecture as a way to increase the value of their ERP investments. Use of Maximo Asset Management as a strong operational system can enhance the quality of asset data, contribute to the safety of the workforce, and help facilitate best practices that directly and significantly impact the long-term success of the business.

For more information

To learn more about IBM Maximo Asset Management, contact your IBM representative or IBM Business Partner, or visit **ibm.com**/tivoli or maximo.com

About Tivoli software from IBM

Tivoli software provides a comprehensive set of offerings and capabilities in support of IBM Service Management, a scalable, modular approach used to deliver more efficient and effective services to your business. Meeting the needs of any size business, Tivoli software enables you to deliver service excellence in support of your business objectives through integration and automation of processes, workflows and tasks. The security-rich, open standards-based Tivoli service management platform is complemented by proactive operational management solutions that provide end-to-end visibility and control. It is also backed by world-class IBM Services, IBM Support and an active ecosystem of IBM Business Partners. Tivoli customers and partners can also leverage each other's best practices by participating in independently run IBM Tivoli User Groups around the world – visit www.tivoli-ug.org

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