

Managing Assets for Maximum Performance and Value

In Asset-Intensive Industries, Lifecycle Management is the Foundation of Success

Catalyst

State-of-the-art asset management is critical in industries such as oil and gas exploration & production, oil refining and gas processing, and utilities that rely heavily on expensive and aging physical assets. Among other benefits, effective asset management reduces costs and risks, improves process flows and business continuity, increases profit margins, and aids in regulatory compliance. As these industries become more complex and competitive, and as more of their assets reach the end of their useful life, end-to-end or lifecycle tracking of asset data grows steadily more important. So does the need to align this approach with standards and to develop a clear plan or maturity model to guide investment, track progress, and ensure compatibility with overall corporate strategy. Despite its many benefits, however, asset lifecycle information management (ALIM) is an immature discipline and is currently underutilized in asset-intensive industries. Companies that effectively implement a lifecycle model have a substantial opportunity to gain competitive advantage.

Ovum view

Historically, the complexity of asset management has grown more quickly than the technologies required to tame it cost-effectively. Custom solutions have been expensive, forcing companies to make cost/benefit tradeoffs and accept greater risks (in factors such as compliance, downtime, environment, health, and safety) and higher costs than they would prefer. Paper records are still prevalent in these industries, which can delay critical processes and increase risk. Some companies have chosen to risk safety and compliance fines rather than invest in information technologies to reduce those risks.

However, today the IT tools are catching up – growing in capability and declining in price. Investments in asset management software can provide benefits that far exceed the costs and technical challenges they entail. Key to this approach is to manage assets on a lifecycle basis, tracking all relevant data from concept and commissioning through end-of-life and disposal. Such an approach can optimize visibility into current operations and create a solid platform for master data management, business intelligence, and analytics.



ALIM should not exist in a vacuum, however. It should be aligned with standards such as PAS 55 and the recently published ISO 55000 (www.iso.org) and with a maturity model that helps the enterprise to optimize its investment. This will ensure that the ALIM solution is comprehensive and meshes with existing infrastructure and corporate strategy and that there are clear milestones against which the enterprise can measure its progress. This approach also enables flexibility so that the ALIM system can adapt to likely future developments as well as uncertainties and can support related elements such as staff training and change management.

Such an approach benefits both sides of the ledger, reducing costs and risks while improving service and operational performance. But too many companies are stuck at the wrong end of the ALIM maturity curve. In November 2013 Ovum conducted a survey of 100 IT decision-makers and influencers in three industries – utilities, oil and gas exploration & production (E&P), and oil refining/gas processing – and found that the ALIM approach is not yet widely adopted or even understood. Accordingly, while most companies in these industries are not achieving the benefits ALIM can provide, they still have substantial opportunity to gain competitive advantage by adopting ALIM ahead of their peers.

Key messages

- The current state of asset management is far from ideal, leaving companies exposed to greater costs and risks than necessary.
- Multiple factors are driving demand for asset information technologies.
- In scope, ALIM must be as broad as possible; in function, it must be accurate and relevant.
- ALIM plans must align with standards and models that guide investment and mesh with overall strategy.
- Companies that have adopted ALIM report strong benefits and satisfaction.
- Despite its advantages, ALIM is not yet widely adopted; fast followers can gain significant competitive advantage.

THE CURRENT STATE OF ASSET MANAGEMENT IS FAR FROM IDEAL

Many current systems are outmoded and inefficient

The utilities, E&P and refining/gas processing industries are many decades old. For example, the newest large refineries (having capacity of 100,000 barrels per day or more) in the US were built in the 1970s. Many of their processes long predate the era of information technology and still rely on paper records for asset management. And for many years, a relative lack of information forced them to manage assets on a "break/fix" or "run to failure" model.



Many companies in these industries have left "break/fix" behind and progressed to scheduled maintenance based on data from equipment manufacturers or from their own experience. This model is a big step forward, but it still is based on approximations and generalizations. These limitations can lead to higher costs and more downtime when assets are serviced or replaced sooner than needed or when they fail sooner than expected -- for example when used in unusually harsh environments.

A handful of companies have taken further steps in asset management, moving toward models based on real-time condition data and/or predictive analytics that enable just-in-time service or replacement to minimize delays and cost increases and maximize business continuity. At the leading edge, a few enterprises are adopting prescriptive analytics that provide recommended actions to achieve a defined goal, such as maximizing production and minimizing operating costs. In one early test, a major oil producer is using prescriptive analytics technology in its worldwide oil fields to predict (and avoid) the failure of electric submersible pumps (ESPs) and the associated loss of production. Neither the producer nor the analytics vendor has released details, but they say the project has significantly improved production from the wells being analyzed in this way, helping the producer make better decisions about which ESPs to deploy and how to maximize production using existing ESPs.

But such applications are not yet in wide use. In his 2008 book *Physical Asset Management for the Executive*, author Howard Penrose calls proper management of physical assets "the single largest business improvement opportunity in the 21st century." Penrose estimated the size of the US asset maintenance industry at \$1.2 trillion in 2005, of which \$750 billion – more than 60% – represented the direct cost of poor physical asset maintenance and management.

Similarly, according to a study of the capital facilities industry (not unlike the asset-intensive industries covered in our survey) by the US National Institute of Standards and Technology, some 40% of engineering time is spent locating and validating information. If our three target industries face similar problems – and there is no reason to think they are exempt -- their cost in reduced engineering productivity alone could reach into the billions worldwide.

Faulty asset data can cause or worsen a wide range of problems

In many cases, gaps and conflicts in asset data are unavoidable, the cumulative result of decades of inadequate tools and human error. Often these problems are so deeply embedded that they are no longer noticed.

But consider for a moment some of the ways an enterprise suffers when asset data is incomplete, hard to find, incorrect, or inconsistent. Procurement orders too many spare parts, or too few. Project planners can't be certain that a required piece of equipment will be available when needed or that it will be in good working order. Maintenance crews spend inordinate amounts of time searching for information, only to discover that it isn't correct. They cannot accurately estimate project completion times and resources. Accounting is less precise. Plant operators use incorrect versions of standard operating procedures. Production and service levels may suffer, and the company may face higher costs to catch up or re-establish goodwill, or – even worse – to deal with a catastrophic event.



Poor asset management not only raises costs and erodes profits – it also can increase risks to people and the environment. The Deepwater Horizon explosion in the Gulf of Mexico in 2010 took 11 lives and spilled nearly 5 million barrels of oil into the gulf, making it the largest accidental spill in history. Penalties, legal fees and settlements, and remediation programs have cost BP more than \$40 billion.

The spill has been attributed to a bad cement job and a failure of the well's blowout preventer (BOP). For purposes of this discussion, the key point is that BP didn't learn until after the spill that the BOP had undergone significant modification, according to testimony before a committee of the US House of Representatives. That information gap contributed to uncertainty and delay in efforts to cap the well. This is a clear demonstration of the linkage between complete asset information and strong asset management.

This example comes from the E&P industry, of course, but asset management challenges are endemic in all three asset-intensive industries addressed in this report. In the utilities industry, for example, many organizations lack accurate records on the condition of their transmission and distribution systems. As a result their systems are less reliable, and they face higher costs for spare equipment and maintenance teams than they would if they had better asset information. Last year the Southern African Asset Management Association estimated that poor asset management increases utilities' costs of product and service delivery by as much as 25% and said that figure may grow because costs are increasing much faster than product and service delivery.

In refining and natural gas processing, numerous core processes require high temperatures and pressures. After a Venezuela refinery explosion in 2012 that killed more than 40 people, critics said part of the cause was poor maintenance oversight. Refineries elsewhere may be subject to closer regulation and inspection, but the US Bureau of Labor statistics recorded more than 120 work-related fatalities in US refineries in 2008, and more than 4,000 recordable injuries in 2007.

Yet another dimension of the asset management challenge involves business analytics. At a time of growing business complexity, economic uncertainty, and ever-fiercer competition, enterprises are striving to make better use of analytical tools. These tools are becoming steadily more capable. But every analytical query, no matter how simple or complex, depends on reliable data to yield an accurate answer.

MULTIPLE FACTORS ARE DRIVING DEMAND FOR INFORMATION MANAGEMENT TECHNOLOGIES

Key technology goals include better document management and data storage and support for analytics

Our survey found that a wide range of factors are driving demand for ALIM and several other information management technologies. Out of seven technology-related factors, the two that most respondents considered "critically" or "very" important were document and records management and



data storage/warehousing. Their third-highest priority was improving analytics, with data integration and consolidation close behind.

■ Not important ■ Somewhat important ■ Very important ■ Critically important 100% 8% 12% 12% 12% 11% 13% 14% 80% 44% 39% 46% 45% 46% 45% 50% 60% 40% 48% 48% 42% 41% 43% 41% 20% 38% 0% Document/ Data storage/ Improve Data integration/ Simplify Manage large Document warehousing analytics consolidation archiving data sets migration records mgmt n = 100

Figure 1: Technology needs driving demand for information management

Source: Ovum

But the striking thing is that more than half of respondents view all seven categories as "critically" or "very" important. In addition to the four already mentioned, other drivers are to simplify archiving, manage large data sets, and achieve document migration. Taken together, the results suggest that respondents have a realistic view of the benefits they can achieve and the steps required to get there – that is, they see that analytics must be based on a solid foundation of document management, reliable storage, and integrated data, among other factors.

Business factors

Mobility, operating expenses, and transmittals top the priority list, followed by environment, health, and safety

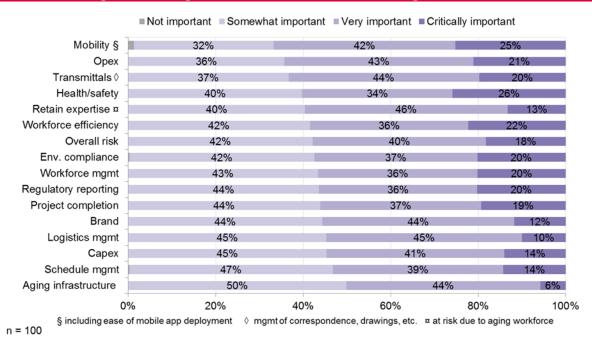
We also asked respondents to rate the importance of 16 different business factors in driving demand for application information and performance management capabilities. In application information management, the top two concerns (again, measured by the total of "critically" and "very" important ratings) were reducing operating expenditures and improving mobile capabilities, with little difference between the two ratings. In application performance management, respondents identified the same two issues as top priorities, but in the reverse order – mobility first, then opex – but again with little difference in ratings.



The differences may reflect individual circumstances, and the categories are not necessarily mutually exclusive. One company might identify opex as its top concern, while another might focus on mobile technologies as a way to improve field crews' efficiency, which also would reduce costs. Respondents also placed high importance on tools to help them manage transmittals of all the information involved in managing a given asset: documents such as design drawings, as-built drawings, contracts, emails, and the like that are involved in managing any given asset. Respondents want to be able to track such transmittals more closely, reliably, and securely and to better understand the information they contain – for example, by searching and analyzing unstructured text.

Environment, health, and safety issues also are a high priority. This is to be expected, given the inherent dangers in all three industries – high temperatures, pressures, and voltages, to cite but a few.

Figure 2: Business goals driving demand for information management



Source: Ovum

The big crew change

Another key challenge affecting many asset-intensive industries is the one known in the E&P business as "the big crew change": the accelerating retirement of baby boomers who take decades of institutional and asset knowledge and experience with them when they leave.

During years of relatively low oil prices and profits, the E&P industry was not seen as offering attractive career opportunities, so the workforce was not steadily replenished by young college graduates who could rise through the ranks. The industry has become much more lucrative in recent years, and E&P companies are able to attract larger numbers of well-trained younger workers. But it is



not enough to offset the loss of knowledge and expertise they face today as retirement rates increase. They recognize that this is a problem they must address through better use of technology to retain critical information and make it more widely accessible.

Similar dynamics affect the utilities and refining/gas processing industries. Across all three, the loss of experience is driving investment in information systems that can capture and utilize the troves of asset knowledge and expertise now stored in their employees' heads.

IN SCOPE, ALIM MUST BE AS BROAD AS POSSIBLE

In business, as elsewhere, a solid structure rests on a good foundation

The power of asset lifecycle information management in asset-intensive industries is that it is so fundamental. Properly designed, ALIM provides the most solid foundation on which to successfully track, analyze, understand, and manage the business. Properly used, ALIM provides not just a foundation but a structure within which to organize the asset-intensive business. Fully exploited, ALIM provides an observation tower, if you will – a layer above the foundation and structure – from which to view the business and understand the complex process interactions that enable or impede success.

Ideally, ALIM should encompass and thoroughly document everything that defines these industries. In E&P, this means drilling rigs, platforms, and drill ships; pumps and drill bits; drill pipe and casing; bottom-hole assembly components, kelly drives, elevators, and everything else down to the last nut and bolt. In a utility, ALIM must cover everything from generation plants to customers' meters and all of their component parts. In refining and natural gas processing, an ALIM system must span every process unit from desalting and distillation to catalytic reforming and alkylation; every storage and wastewater treatment unit; and every pipe, valve, and storage tank.

The ALIM system must capture and retain all relevant data about these assets: descriptive data such as model numbers, serial numbers, sizes, weights, and so on; historical data such as operating history, change orders, and service and repair logs; related intellectual property such as standard operating procedures, repair procedures, inspection requirements, certification records, and test results; current information on location, availability, condition, and so on.

As its acronym implies, an ALIM system must retain all of this information throughout its useful life, in appropriate formats – project-based formats during design and construction, for example, and tagbased formats for operations and maintenance. But enterprise responsibilities do not end when an asset is retired. Careful decommissioning makes sure that assets with remaining value can be reused and that any toxic or regulated materials are handled in accordance with relevant regulations. Legal liability may continue for years, further increasing the importance of comprehensive asset data management.



Some data live inside the ALIM system, others outside it

While an ALIM system should be as broad in scope as possible, no system can hold everything. Enterprises frequently have asset-related data stored in systems they don't want to replace – product lifecycle management systems, project management systems, procurement and supply-chain management systems, and the like. Additional relevant data will likely reside in their enterprise resource planning and financial management systems.

In the early stages of asset data management, it may be sufficient to know where the data resides and to be able to access it, even if each database remains isolated from the others. But this state of affairs leaves much asset data untapped. Central to the design of an ALIM system should be a roadmap or maturity model to guide implementation and make sure the system integrates all relevant data so it can support holistic analysis. It may be cost-prohibitive to do this right away, but it ought to be in the plan.

IN FUNCTION, ALIM MUST BE ACCURATE AND RELEVANT

Rapid change can quickly make asset data unusable

Asset data is not static. It must be kept current as equipment is inspected, serviced, moved, or deployed in new situations and operating conditions. It must be available to – and trusted by – everyone who needs it: engineers, procurement officers, planners, schedulers, various managers, duty holders (owners or operators), and more. A given asset may change hands many times during its life, which makes it harder to ensure that the relevant data is kept complete and accurate.

On the other hand, accurate asset data benefits everyone who handles or owns the asset. Service crews and managers have an obvious interest in complete and accurate data, because they depend on it to ensure they can complete their work safely and efficiently. Such information is also valuable when an asset changes hands. If a piece of equipment is to be sold, it will command a higher price if its history has been properly documented – who would buy a significant piece of equipment without trustworthy records showing that it had been properly maintained and not used in operating conditions that could compromise its integrity?

Such documentation must not only be present, it must also be usable. Any sales contract should specify not only that the relevant asset data be included, but also that it be provided in useful form – not just thrown in boxes without any rhyme or reason.

Moreover, the asset management system must maintain all this data indefinitely, long after an asset has been sold or removed from service, until an informed decision can be made that the data will never again be needed, whether for business purposes or to meet regulatory or auditing requirements.



An ALIM system must organize and expose asset data in ways that support multiple users, purposes, device types, and related applications

Different types of users – various managers, service teams, end users, buyers and sellers, lessors and lessees, vendors, subcontractors, and the like – will have different requirements for asset data, in terms of form as well as content. The ALIM system therefore must be able to tailor both the information it presents and the interface.

A service technician will need up-to-date diagrams, schematics, maps, and change-order histories to make repairs quickly and safely. An inspection crew on an offshore rig would need a comprehensive list of the assets in use and their history with regard to operations and previous inspections. A financial analyst or accountant will need all of the cost data associated with a particular asset in order to understand and optimize its lifetime value. Any user might need to access the data via different devices – smartphones, tablets, laptops, PCs, and even barcode or RFID readers – depending on circumstances.

The ALIM system also should support native collaboration across all relevant users, again covering a range of devices and connectivity models, as well as out-of-the-box integration with asset management platforms customers and partners might already have in place. And it must place information in context. For example, operating and safety-related data must be available instantly, while data that is less time-sensitive (such as information required for periodic internal or regulatory reports) can be stored until needed.

An ALIM system should also provide a foundation for process optimization, helping users find data relevant to their needs and supporting asset and project information management tools, predictive and prescriptive analytics, and more. All of these have roles to play in optimizing the use of enterprise assets. None can achieve their intended purpose if they are not based on, or do not have access to, a foundation of comprehensive, accurate data – in other words, an ALIM foundation.

ALIM solutions must avoid key adoption inhibitors

In our survey, we queried respondents about seven business challenges that can impede the adoption of information management technologies. The biggest obstacle they identified – the one that drew the largest share of "critically important" ratings – is a lack of clear benefits. Next on the inhibitor list was manager support – just 7% designated this as "critically important," but fully 61% said manager support was "very important." The ratings for benefits of and managerial support for ALIM may well be related, and both may reflect the early stage of the market -- that is, it would be difficult to enlist managerial support for an investment of uncertain benefit. This underscores the importance of identifying clear near-term goals as part of developing and implementing a maturity model.

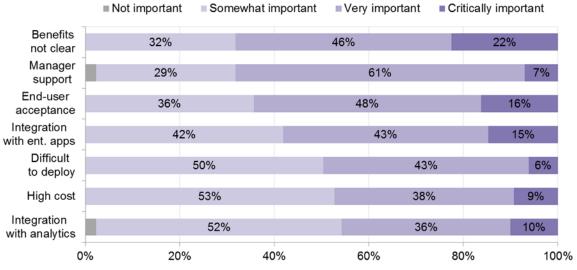
End-user acceptance was rated third-highest in importance among ALIM adoption inhibitors, which points to the benefit of involving as many users as possible in the goal-setting process and



development of the maturity model. One other factor – ease of integration with enterprise applications – also drew a large share (58%) of "critically" or "very" important ratings.

Nearly half – 49% – of respondents cited deployment challenges as critically or very important; 47% cited cost. And even the least important inhibitor on our list – ease of integration with analytics applications – was rated critically important by 10% of respondents and very important by another 36%.

Figure 3: Inhibitors to adoption of information management technologies



n = 129 (respondents could choose more than one category)

Source: Ovum

These ratings appear to reflect a pragmatic view on the part of most respondents. They want to be clear about the benefits they can expect from an investment in information management, they are concerned that managers may not support such initiatives, and they are skeptical about whether end users will embrace them. These make sense as first-order concerns. We would expect the integration-related factors to grow in importance, however, as more enterprises become aware of the potential value of asset information management technologies. As that awareness evolves, more enterprises will understand that they cannot realize the full value of an ALIM investment unless it is fully integrated with both the enterprise applications they already rely on – in particular, ERP, maintenance management, project management, supply chain, and financial management tools – and the analytics tools that are becoming steadily more critical to success.



ALIM PLANS MUST ALIGN WITH STANDARDS AND MODELS THAT GUIDE INVESTMENT AND MESH WITH STRATEGY

With asset management still at an early stage of maturity, it is important to exploit current standards initiatives

The leading organization in the asset management field is the Institute for Asset Management, headquartered in Bristol in the UK. The IAM led development of the standard known as PAS 55, which was originally published in 2004 by the British Standards Institution. (PAS stands for Publicly Available Specification.) The IAM has developed a clear framework for asset management, which it included in a 2012 publication titled *Asset Management - an Anatomy*. While IAM has continued to develop PAS 55, in recent years it has also aligned with the International Standards Organization, which recently published the ISO 55000 standard based closely on PAS 55. ISO 55000 is likely to grow in significance in asset-intensive industries; as more companies adopt it, compliance certification may well become a requirement for regulators and insurance companies.

Even the IAM describes asset management as an "emerging" management discipline and is primarily seeking, rather than distributing, case study information about the business benefits of asset management.

Still, the IAM framework has considerable value, especially given that it is on the cusp of international acceptance. Enterprises that align with it today can expect to reap benefits as more of their suppliers, partners, and customers do so in the future.

The IAM describes PAS 55 in terms of seven key principles, which are also reflected in the new ISO standards. According to the IAM, a well-developed asset management system is:

- Holistic: cross-disciplinary, total-value focused
- Systematic: rigorously applied in a structured system
- Systemic: assets are considered in the context of their systems, also total-value focused
- Risk-based: risk is incorporated into all decision-making
- Optimal: able to seek the best compromise among conflicting objectives, such as costs, performance, risk, and the like
- Sustainable: able to optimize asset life, systems performance, and environmental and other long-term consequences
- Integrated: "joined up" so that asset data becomes more than just the sum of the parts and functions as a whole.

We would add that such a system should be able to manage essentially unlimited types and amounts of asset data. It also should support the use of analytics tools for any type of query, from simple to complex. A simple query might be one in which a manager needs to know the repair frequency of a



certain piece of equipment; a complex one might involve predicting when an electric submersible pump might fail when installed in an oil well with very high temperatures and producing crude oil containing highly corrosive and/or abrasive substances.

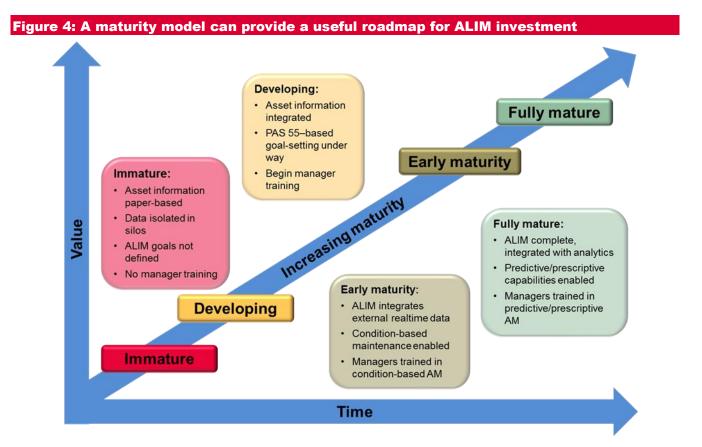
A standardized approach fits naturally with the use of a maturity model

While adherence to standards allows a company to freely exploit years of expert thought and effort in creating an ALIM initiative, a good maturity model can help a company ensure that its ALIM plan is comprehensive, defines clear milestones, and generates a return on investment sooner rather than later. Corporate strategy should help to define the ALIM initiative, but the reverse is also true: an ALIM initiative and a maturity model can clarify and improve overall corporate strategy.

A good maturity model helps the enterprise to understand its current capabilities in asset management, define a desired "end state," and create a roadmap to reach it. Given the IAM's description of asset management as an "emerging" discipline, most enterprises will be positioned toward the "immature" end of the maturity distribution curve. As shown in Figure 4, the immature stage is defined by information silos and a lack of defined goals. At the mature end of the curve, enterprise assets will be tightly managed and available to users through interfaces tailored to their needs and responsibilities. Asset information will be thoroughly integrated with enterprise applications and analytical tools, with the ALIM system providing a high degree of visibility and efficiency. In between the immature and mature ends of the spectrum will be a series of clear steps that identify incremental, affordable investments that deliver steady functional enhancements and business benefits. Included in those steps will be milestones and checkpoints that the enterprise can use to gauge its progress and change course as needed.

Finally, a well-designed maturity model will address additional capabilities and programs necessary to a successful ALIM initiative, from testing and piloting through full deployment and ongoing operation, including appropriate training for all users.





Source: Ovum

Equally important to ALIM success are programs designed to optimize ease of use and win the support of users and managers. This process is overlooked in many IT initiatives, or given only cursory attention, but it deserves high priority and a clear place in the maturity model and implementation plan.

Developers responsible for application functionality and UI can easily develop a "we know best" attitude, but they must validate their decisions with those who will actually use the application and incorporate constructive "real world" input. If users view the system as an impediment, not a help, and either refuse to use it or do so only minimally and grudgingly rather than enthusiastically, the application will fail.

Enthusiastic support is both highly desirable and eminently feasible if end users are brought into the design process early and developers genuinely address aspects that end users identify as cumbersome, inscrutable, or counterproductive. (It is also true, of course, that some elements of a new system may be essential even if end users don't like them; such concerns must be addressed through training, explanation, and again a willingness to modify such elements to make them less objectionable while preserving their core function.)



Customers must choose carefully among a variety of maturity models and sources

There are many places where an enterprise can look for a relevant maturity model. Several vendors have developed their own; some industry organizations have as well. Executives planning an ALIM implementation in one division or business unit may find a relevant model in use elsewhere in their organization.

Whatever sources they consider for a maturity model, enterprises should recognize that PAS 55 and ISO 55000 are the best-developed standards. They should study the components of these standards and take advantage of tools available through the IAM.

COMPANIES THAT HAVE ADOPTED ALIM REPORT STRONG BENEFITS AND SATISFACTION

ALIM users saw benefits across both business and technology factors

Business factors

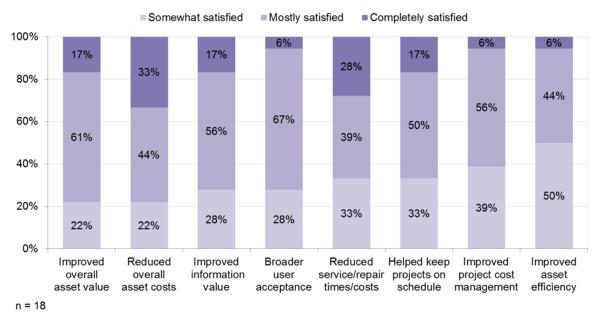
Among the companies in our survey that have deployed or are trialing an ALIM solution, 50% or more said they are completely or mostly satisfied with the business benefits achieved in all eight categories we asked about.

The highest-rated categories were "improved overall asset value" and "reduced overall asset costs." More than three-quarters of respondents said they were completely or mostly satisfied with their improvement in overall asset value (78%) and their reduction of overall asset costs (77%). In the highest-rated single category, 33% of respondents are completely satisfied with the reduction they achieved in overall asset costs.

As shown in the Figure 5, respondents also reported high satisfaction in five other categories: information value across the organization, user acceptance, reduced time and cost for service and repairs, keeping projects on schedule, and improving the management of project costs. Even in the lowest-scoring category, improved asset efficiency, half of respondents said they were completely or mostly satisfied with the benefits they had achieved.



Figure 5: Companies that have deployed or are trialing ALIM saw strong business benefits

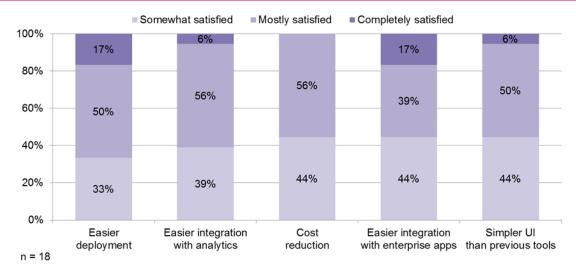


Source: Ovum

Technology factors

Asked about five technology-related benefits, 56% of the companies that have adopted or are trialing ALIM said they are mostly satisfied with their achievements in integrating ALIM with analytics and in cost reduction. Two-thirds said they were completely or mostly satisfied with their achievements related to ease of deployment.

Figure 6: ALIM users also reported strong technology-related benefits



Source: Ovum



ALIM users also reported strong satisfaction in both business and tech

Business factors

After asking about the benefits they had achieved, we asked our survey group a similar question about their satisfaction in terms of nine different business factors. They reported their strongest results in service/repair times: 22% of respondents are completely satisfied with their investment, and another 61% are mostly satisfied.

Large majorities expressed high satisfaction with ALIM in terms of compliance management (6% completely satisfied, 71% mostly so). More than 60% were mostly or completely satisfied in terms of project scheduling and cost management.

■ Not satisfied Somewhat satisfied Mostly satisfied ■ Completely satisfied 100% 6% 6% 6% 11% 11% 22% 80% 44% 44% 50% 56% 44% 61% 50% 60% 72% 61% 40% 50% 50% 39% 33% 44% 20% 28% 39% 22% 17% 0% Service/ Compliance Project Health/ Project Ease of use Asset costs Asset value Service/ repair times mgmt scheduling safety mgmt cost mgmt repair costs n = 18

Figure 7: ALIM users reported high satisfaction across nine business factors

Source: Ovum

Technology factors

Across six technology factors, respondents said they were mostly or completely satisfied in all but one. Some 61% said they were completely or mostly satisfied in terms of ease of integration with analytics. In three categories – cost, integration with enterprise applications, and user interface – 56% said they were completely or mostly satisfied. Cloud deployment was only one percentage point lower, though 6% said they were not satisfied in this area; 50% said they were completely or mostly satisfied in terms of on-premise deployment.



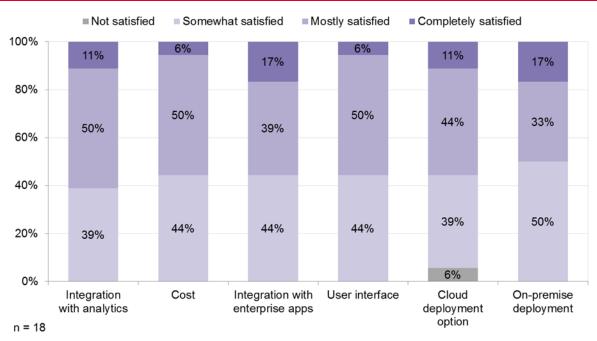


Figure 8: Several technology factors that contribute to ALIM satisfaction

Source: Ovum

DESPITE ITS ADVANTAGES, ALIM IS NOT YET WIDELY ADOPTED; FAST FOLLOWERS CAN GAIN ADVANTAGE

ALIM is more "ready" than its penetration figures suggest

In our survey, less than 20% of respondents said they have deployed or are trialing ALIM, a lower proportion than posted by information and performance management technologies. We believe that figure reflects two main factors. One is that the entire field of asset management is relatively new. The other is that the lifecycle approach may suggest to some a daunting level of complexity, encompassing every piece of relevant data, for every physical asset, across its entire useful life and beyond.

As to the first factor, although the field may be newer than categories such as ERP or CRM, the PAS 55 standard has been evolving for more than 10 years and is far beyond infancy. The ISO's recent publication of the 55000 standard bespeaks a level of maturity that asset-intensive enterprises should find reassuring.



As to the second point, there are well-recognized approaches for taming complexity. The utilities, E&P, and refining/gas processing industries include some extremely large and technologically sophisticated enterprises with strong track records when it comes to managing complex IT.

Clarifying benefits

We believe the single greatest challenge to ALIM uptake is the fact that many potential adopters are not fully aware of the benefits to be gained. In part this reflects a "business as usual" attitude that grew deep roots in the decades before information technology was available. Many inefficient practices have been in place for so long, and have become so familiar, that they are rarely scrutinized. However, we expect that competitive pressures, increased public scrutiny, regulatory oversight, and volatile markets will force many asset-intensive enterprises to shed complacency and thoroughly reexamine all aspects of their operations. As they do, they will quickly realize the opportunity that awaits them precisely because their operations are so asset-intensive and the technologies required to manage those assets are maturing in capability and falling in price.

As this realization dawns, it won't take enterprises long to understand the cumulative value of examining dozens of embedded processes and finding a percentage point or two of savings in each.

Addressing integration

There remains the question of integration – the steps that will be needed to smash data silos and harmonize conflicting formats to gain a clearer view of operations and find new efficiencies and savings. This is not an all-or-nothing proposition; enterprises should be able to identify regions or business units where they can start the ALIM process with confidence that their investment will generate a positive return and also provide experience for implementing a system more widely.

Embracing change

One key to success will be to understand the extent to which enterprises will have to modify existing processes in order to achieve the benefits they want from their ALIM investment. Because ALIM is so fundamental to an asset-intensive organization, these changes may be extensive, affecting everything from accounting, procurement, and supply-chain management systems to resource planning and more.

Still, this is the kind of evaluation that well-run companies undertake routinely. And many of the gains they are seeking may be hiding in plain sight. Companies seeking to estimate the advantages of ALIM should pay particular attention to these aspects of their operations:

Downtime due to unreliable assets and the financial effects of that downtime. This can
delay projects or degrade performance enough that the enterprise falls short of
contractual commitments. This is problem enough in its own right, but it can be
compounded by a loss of goodwill that affects future business.



- Cost increases that stem from efforts to make up production losses, such as additional
 personnel costs for overtime or temporary hires, subcontracting, or the purchase of
 product from third-party suppliers.
- Fines, penalties, legal liabilities, lost time, workers compensation, and insurance costs due to environmental violations or health and safety incidents.

Seizing opportunity

It is not just nature that abhors a vacuum; so does the business world. When a new market emerges, smart businesses are quick to exploit it. When business conditions change, smart businesses are quick to identify which doors are closing and which new ones are opening. When a new technology creates an opportunity to reinvent old processes, smart businesses are quick to seize the opportunity. That is the situation today with ALIM.

RECOMMENDATIONS FOR ACHIEVING OPTIMAL RESULTS

- Define your ALIM system: Start now; don't suffer through repeated asset-related disruptions, delays, EHS incidents, and penalties/fines before acknowledging the advantages of ALIM. Carefully define the benefits to shrink the uncertainty that is a key inhibitor of ALIM investment today.
- Align ALIM with overall strategy: Don't commit to an ALIM plan until you're sure of that alignment. This may require further definition/clarification of corporate strategy.
- Select or develop an appropriate maturity model: Search widely; look to industry associations and other industries as well as vendors. Vendor models may be useful, but they may foster lock-in make sure you understand the tradeoffs before committing.
- **Define a comprehensive implementation plan:** ALIM may entail major changes across the business, in service/repair, procurement, accounting, etc. Exploit PAS 55 and ISO 55000 methodologies to ensure a holistic plan.
- **Avoid scope creep:** Plan carefully, then stick to the plan. Change in midstream is an invitation to trouble such as higher costs, delays, and unexpected consequences.
- Eliminate custom coding: Any company can make a case that its uniqueness requires custom technologies. The smartest ones get over themselves and stick with standard technologies and configurable solutions.
- **Get everyone involved:** Include users at all levels in design/planning/implementation, as early as possible. Critical expertise is often held by the people who install cables and turn wrenches. Many are reaching retirement age, so it is critical to move quickly.
- **Build end-user support:** Incorporate user testing and training from the start to build buyin and "debug" the system more quickly. This will speed deployment and raise both usage levels and ALIM effectiveness.



APPENDIX

Survey methodology and demographics

- Sample size: 100
- Industry distribution: Utilities (50 interviews); E&P (25 interviews); refining/gas processing (25 interviews)
- Scope of operations: 58 national, 24 global, 18 regional (10 Europe, 4 Asia-Pacific, 4 North America)
- Company size: 86% of respondents have annual revenues greater than \$1 billion; 10% have revenues of \$500 million to \$1 billion
- Industry breakdowns:
 - Utilities: 46 regulated, 54 deregulated; 10 have ≥ 1.5 million meters deployed, 40 have 350,000 to 1.5 million meters
 - Refiners, gas processors: 19 independents, 6 are units within vertically integrated companies
 - o E&P: 4 international oil companies, 21 national (state-owned) oil companies

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We hope that this analysis will help you make informed and imaginative business decisions. If you have further requirements, Ovum's consulting team may be able to help you. For more information about Ovum's consulting capabilities, please contact us directly at consulting@ovum.com.

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