

Do Your Assets Deliver Real Value?

How An Asset Management Transformation Can Turn Your Organization Into A Leader In The Utility Industry.

By Josh Hoops, UMS Group Inc.

There are a number of factors that impact a utility’s decisions regarding the management of its critical assets; including (1) balancing the realities of aging infrastructure with the ever-changing paradigm of the Utility of the Future, (2) meeting increased customer expectations regarding safe and reliable service, (3) managing the convergence of IT and OT amidst the advent of “Big Data” and “Business Analytics,” (4) achieving stated or implied mandates to reduce costs, and (5) complying with ever-expanding environmental regulation. Rapid technological advancements in the physical assets and systems used to manage them, under the auspice of a well-conceived asset management strategy and plan, makes it possible to asymmetrically and effectively deal with these factors. In fact, the absence of such a strategy and plan will likely lead to failure in a few, if not all, of these domains. And, though many utilities have already initiated efforts to improve its management of physical assets, most have done so in a manner that precludes capturing the full benefits of such a comprehensive undertaking. This paper, in essence, returns to the basics, outlining the effort required to effect such a transformation, and through the use of case studies, summarizes the challenges and opportunities one can anticipate in a total asset management transformation.

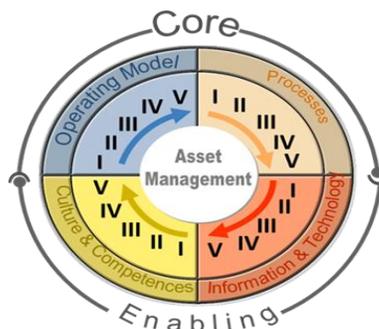


What Defines an Effective Asset Management Program?

The ISO 55000 standard (and its predecessor PAS 55) provides the framework, around which to build a risk-based approach to managing assets (i.e.; the essence of effective asset management). This framework can be distilled into four elements (see figure below), two of which are “core” to the organizational elements of an Asset Management transformation (i.e.; Operating Model and Processes), and two that, when addressed, will “enable” and assure a sustainable process (i.e.; Information/Technology and Culture/Competencies).

Why a Major Transformation?

As the name implies, major transformations, in any form, require intense focus and consistent communication across an entire organization; particularly on the part of senior management. Focus and communication are even more relevant to an asset management transformation, as the term itself can be



Core are the essential elements to build a basis for risk based asset management

-  Implement best practice asset management organizational model: key business roles, responsibilities and accountabilities clearly defined
-  Implement best practice asset management processes: determine Business Values Framework, Asset Risk Management, Investment Planning, Investment/Spend Portfolio Management and Investment Delivery

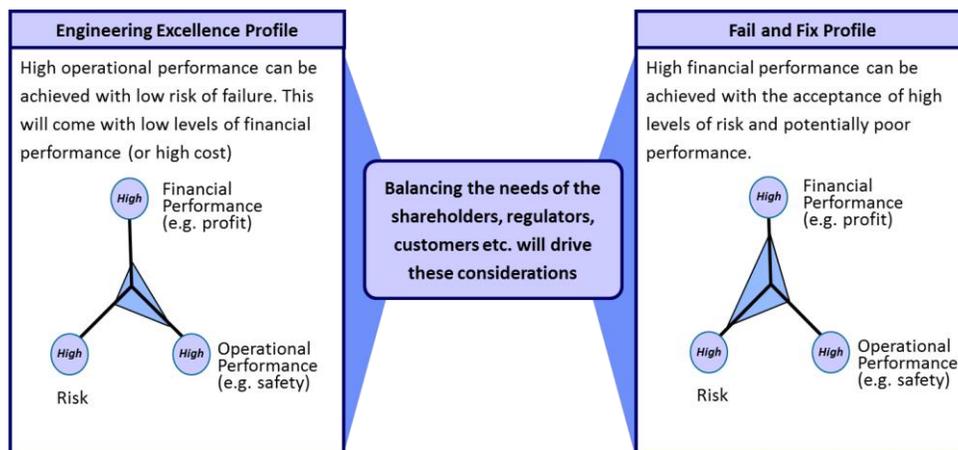
Enabling focuses on providing the organizational capabilities for asset management by enabling technology and Asset Information Management as well as people development

-  Provide the right data for decision making through the asset data repository and risk register and apply asset/performance management analysis tools
-  Transform from an engineering based company to a business minded company culture. Ensure development of asset management related competencies

easily misconstrued, misapplied in terms of organizational design, and even questioned as to its relevance. After all, haven't we already been managing assets for over 100 years? We have an individual assigned to asset management - can't that individual just take care of what needs to be done in meeting the requirements? And, of course the old standby, how can we afford such an undertaking? However, if one were to view asset management as an operating philosophy (i.e.; not purely an organizational structure issue), using asset condition and performance data to inform and make better decisions regarding the maintenance, operations and subsequent replacement of critical assets (often referred to asset lifecycle), and including a framework that promotes consistency across an organization, it would be hard to argue with the notions that (1) satisfying this definition of asset management is not only reasonable but prudent, and (2) we as an industry have yet to arrive at that level of competence. And, though this definition makes sense and is therefore, easy to state, the implications with respect to change management, new operating disciplines, and more transparent accountabilities render the concept "simple but not easy," thus the call for a major transformation. Every utility is unique as to its current state with respect to such an effort, and therefore asset management implementation roadmaps will vary, but the concepts underlying the journey to "competence" are constant.

What are these Constants?

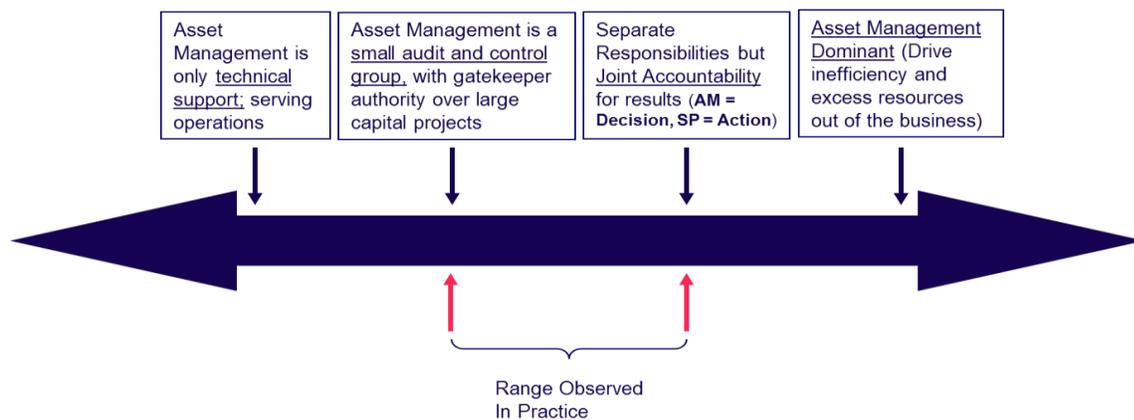
Underlying an effective asset management program is the basic understanding that corporate strategy (specifically related to asset performance and the management of risk around assets) drives decisions related to assets. In its most simplistic form, independent of the more detailed metrics and an accompanying Business Value Framework that connects these metrics to strategy, asset management can be viewed as managing the inherent tension between three perspectives: Risk, Operational Performance and Financial Performance. Corporate Strategy dictates the relative importance of each of these perspectives and therefore, through inference, dictates the type of decisions that will be made on a day-to-day basis. There are no right answers as differing regulatory and political environments, customer expectations, and stakeholder financial expectations will shape the governing strategy. What is important is that the relative importance of these three perspectives, aligned to corporate strategy are known and embraced throughout the organization.



With respect to governance, an Asset Management Policy and supporting Asset Management Strategy provide the procedural approach for balancing these three perspectives, and establishing the landscape

for key tactical elements that define an organization's asset management program; whereas organizational design establishes the platform and informs the focus:

- Asset Management Organizational Design: Ranges from centralized to decentralized structures (including a hybrid of the two extremes), predicated on leveraging the skills and competencies that reside within operations, and building the asset management expertise over time, commensurate to the benefit being derived by operations. Regardless of the structure, it is vital that an Asset Manager be assigned with little, if any, involvement in the crises that can occur in the daily routine of delivering safe and reliable service to customers. Otherwise, the urgency related to these crises will divert attention from the long-term and important initiatives that define an asset management transformation.
- Focus: The role of asset management can range from a comparatively passive technical support role to one that drives decisions to assure effectiveness is maintained and maximum efficiencies are realized. Typically, the range is narrower where there is joint accountability between asset management and operations.



Switching now to the more tactical view, effective asset management includes a number of core processes and practices:

- Economic Lifecycle Modeling, applying condition assessments to generate failure probability and individual asset criticality determinations to calculate risk of failure, translate that risk to risk cost and with consideration to capital replacement / maintenance costs, determine the point at which an asset should be replaced or refurbished.
- Capital Investment and O&M Program Portfolio Optimization, establishing the funding priorities, and optimizing the trade-offs between value and risk, subject to pre-established financial and resource constraints.
- Maintenance Program Optimization, using asset risk profiles to specify maintenance regimens ranging from interval to risk-based maintenance and including fix-on-failure decisions as part of the overall assessment of practical risk treatment options.
- Asset Performance Management, providing transparency to the effectiveness of an asset's performance relative to pre-established performance targets, with line-of site to corporate strategy.
- Asset Class-specific Lifecycle Plans (ALCPs) provide the overall guidance to apply the above-mentioned processes and practices to specific assets within each asset class.

Implied in these processes and practices are the existence of key enablers: asset condition and performance data / information and enabling technologies to harvest, translate and operationalize the data and information into actionable initiatives that maintain asset-related performance within a pre-specified risk tolerance threshold.

Last, the hidden weapon (to facilitate the transformation) or obstacle (to overcome) involves the people. Strong leadership and organizational alignment are essential to recouping the investment in / successfully sustaining the benefits of an asset management program. And, to the extent that implementation includes the participation of all involved in the program (i.e.; Senior Management, Asset Manager and Operations), natural skepticism can be averted and “ownership” for the program achieved.

What has the Industry Experienced in Implementing an Asset Management Transformation?

The experiences of utilities taking on the challenge of an asset management transformation have varied, ranging from abject failure to resounding success. The successes can best be characterized as having properly applied the constants outlined in the previous section, understanding that (1) Senior Management support is essential, (2) asset management is more of an operating philosophy than organization redesign, and (3) asset management requires a long-term perspective, managing costs commensurate to the value being provided to operations. The following two case studies are presented to offer real life examples of the challenges faced and approaches adopted in initially introducing and then implementing an asset management transformation.

Case Study 1 - A vertically integrated North American utility was faced with significant pressure from external stakeholders to lower costs and improve reliability. Their Asset Management System was in its infancy and there were substantial gaps to close. In an effort to initiate and accelerate a full-scale transformation, an assessment of current state was conducted, gaps to industry-accepted standards (ISO 55000) identified, and a comprehensive roadmap was developed to close those gaps deemed essential to an effective asset management system.

The Challenges

- Goals and objectives related to asset management were understood at the senior leadership level, but this understanding rapidly faded as the message was conveyed to those charged with managing and maintaining the assets.
- Asset Policy and Strategy was not formalized nor integrated with the strategic plan, leading to a failure to establish “line-of-sight” between the asset lifecycle plans, company strategic objectives, and employee performance targets
- Asset condition assessments (and subsequent health indexing), focused on monitoring and reporting status, were deficient in driving actions to mitigate risks.
- Capital investment and O&M spending portfolio optimization was more an outcome of a prioritized punch list created by Operations than the product of an approach that optimized the trade-off between value and risk of deferral, subject to budgetary constraints.
- Maintenance programs were viewed as “all or nothing” propositions (in contrast to a well-conceived regimen ranging from “fix at failure” to proactive corrective maintenance driven by asset condition and criticality) and took a back seat to more desirable (yet costly) capital replacement projects.

- Executive Management did not explicitly establish its role as Asset Owner, resulting in organizational misalignment around the business values that would drive asset-related decisions.
- Related to the previous point, the absence of a top-down driven definition of what constituted an acceptable vs. unacceptable risk (e.g.; establishment of a Risk Tolerance Criteria) led to an inconsistent approach in addressing decisions regarding poorly performing or deteriorating assets.
- Data quality, completeness, and integration, was found lacking and there was little activity to bridge these gaps with an approach that harnessed the experience and knowledge of in-house subject matter experts. The significance of this issue was further accentuated by the impending retirements of a rapidly aging workforce.

Transformation Timeline and Noted Improvements

An asset management implementation plan, initially spanning 24 months, was developed, driving the utility towards “competence” in the key domains that relate to an industry standard program:

- Phase I (6 to 8 weeks) – Translate those items deemed actionable from the gap assessment and develop a resource-loaded prioritized implementation plan.
- Phase II (8 to 12 weeks) - Set direction and build momentum for the plan by engaging key stakeholders and conducting organization-wide Asset Management road shows.
- Phase III (6 months) – Establish program governance (e.g.; AM Policy, Strategic AM Plan, Business Value Framework, Risk Matrix, and Organizational Roles and Responsibilities pertaining to asset management) and start the process of achieving alignment between the vision for asset management and corporate strategy.
- Phase IV(6 to 24 months) – Implement key practices / develop deliverables to create change momentum (including Capital Investment and O&M Program Portfolio Optimization, Asset Lifecycle Plans, Risk-Based Economic Lifecycle Management, LOS Performance Management, Maintenance Program Optimization, and IT / Data Management)
- Phase V(24 months and beyond) – Initiate continuous improvement and with the practices / processes in place, consider enterprise-wide technologies to further accelerate their application.

Case Study 2 – A North American T&D Electric & Gas Utility, five years into a major asset management transformation effort, experienced difficulty in defining any real benefits that were being derived from a comparatively large and costly effort. An initial Gap Assessment was performed and a plan was developed and implemented to institute an Asset Management Policy and Strategy; as well as the execution of an implementation roadmap.

The Challenges

- The organization seemed paralyzed by the enormity of the challenge relating to asset management, and, at a more tactical level, conveyed wide-spread reluctance to the use of data analytics to identify issues, assess risk, and assign actions to mitigate asset-related risk.

- Adding to the previous point, the organization was experiencing difficulty in managing the balance between satisfying its urgent system and staff performance requirements and the sustaining focus on the longer-term, more impactful asset management transformation.
- Though the asset management organization maintained a performance management framework aligned to corporate strategy, this congruence of performance objectives to strategy was only loosely applied to the operating groups, and lacking in totality to evaluating individual employee performance.
- Key decision makers were unaware of the KPI targets, let alone business performance relative to them, and only a subset of these key metrics were addressed, albeit informally, in individual performance appraisals.
- The organization was lacking the asset management decision support tools (IT) necessary to enable key asset management functions (e.g.; risk-based economic lifecycle modeling, capital investment and O&M spending portfolio optimization, asset registers and system performance analytics).
- Though the quality of asset-related data met industry standard, there were significant gaps in the availability of data across the operating groups.
- The company was projecting a large number of age-related retirements, representing a significant portion of its knowledge and expertise, with no comprehensive succession strategy evident. In fact, the default strategy of “just-in-time” replacements was in effect. As a result, any opportunities to mitigate the impact through effective knowledge transfer and training were severely limited.

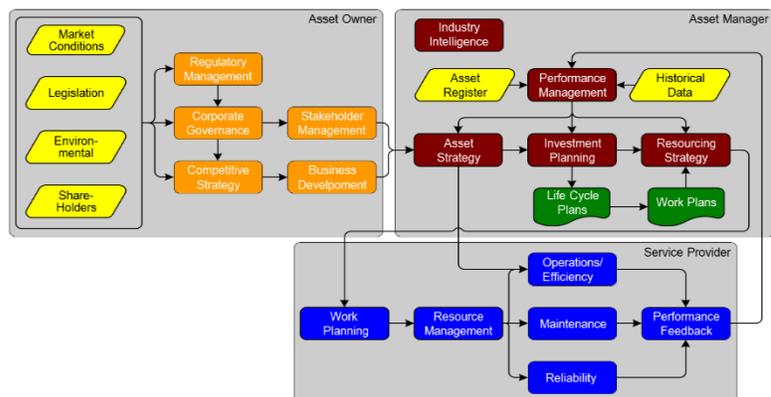
Transformation Timeline and Noted Improvements

The utility embarked on an ambitious yet realistic three-phased plan to complete the majority of the transformation over a 3 year time period; prioritizing the actions to demonstrate dramatic positive changes within the first 12 months:

- Phase I (within 6 months) – By creating the right environment and setting the tone for the business, an asset management vision, strategy and set of enabling objectives were developed. A distinct and separate asset management team was formed; chartered initially with clarifying the roles, responsibilities and interdependencies of all organizations with respect to asset management (in particular the roles of the Asset Owner, Asset Manager and Service Provider). In accomplishing this, the organization experienced a significantly improved level of engagement with and commitment to the transformation. (e.g. Asset Owner, Asset Manager, Service Provider – See below)

Asset Management Roles

- Phase II (Within 18 months): Once role clarity was achieved, the next step involved the design of processes, practices and enabling technologies to begin the process of capturing the benefits of a





comprehensive asset management program. Within the first 12 to 18 months, the company dramatically improved its data collection and analysis capabilities, and, with more informed decisions based on asset condition and performance data, began to experience a decline in the number and impact of critical equipment failures. The company also noted improvement in troubleshooting and predicting failure based on recorded asset condition. The asset management organization began to be viewed by operations as an important factor in their success; and correspondingly, the issues around the completeness of information began to work themselves out.

- Phase III (Beyond 18 months): As the processes, practices and enabling technologies were operationalized, the company (spearheaded by the asset management organization), put in place change management and continuous improvement programs. Though always a “work-in-progress,” these initiatives contributed to a learning organization where the trend regarding asset risk-based decision making and asset risk mitigation steadily improved. Besides noted improvement in system and asset performance, there was less time devoted to counter-productive meetings reacting to the crisis of the day.

Though the specifics of asset-related challenges faced by these two utilities may have differed, the aforementioned factors that drove the need for a more robust approach to asset management are consistent (and remain so when reviewing the utility industry as a whole): Balancing the realities of aging infrastructure with the ever-changing paradigm of the Utility of the Future, increasing customer expectations regarding safe and reliable service, convergence of IT and OT and the advent of “Big Data” and “Business Analytics,” implied mandate to reduce costs, and expanding environmental regulation. An effective Asset Management System, supported by strong Senior Leadership and implemented by a trained and motivated workforce, is foundational to addressing these seemingly conflicting, yet relevant imperatives.

UMS Group is an endorsed assessor by the Institute of Asset Management, the professional body of those involved in the acquisition, operation and care of physical assets – particularly critical infrastructure; and has participated in the development of ISO 55000, (and its predecessor public standard PAS 55), against which organizations are measured for compliance with basic asset management policies and practices.